European Commission

Research Programme of the Research Fund for Coal and Steel

Technical Group: TGK1

Web INTEractive management tool for coal Regions in transition

WINTER

Deliverable 2.2

Legal guide for land rehabilitation and reclamation

Public Report

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Grant Agreement number: 101057228-WINTER-RFCS-2021	

Document Control Page

Deliverable name:	Legal guide for land rehabilitation and reclamation
Deliverable / Milestone number:	D2.2
Work-Package no and title:	WP2: Environmental challenges of coal regions in transition and land rehabilitation solutions
Work Package Leader:	POLTEGOR
Deliverable:	POLTEGOR
Beneficiaries:	Centre for Research and Technology Hellas – CERTH Thessaloniki, Greece DMT-Gesellschaft für Lehre und Bildung mbH, Bochum, Germany Poltegor Instytut ,Institute of Opencast Mining – Poltegor, Wroclaw, Poland
Due date of deliverable:	31/3/2023
Actual delivery date:	31/3/2023
Language:	English
Dissemination Level[1] :	PU
Audience:	public
Status:	final

Dissemination level:
PU = Public
PP = Distribution restricted to other programme participants
RE = Distribution restricted to a group specified by the consortium
CO= Confidential, only allowed for members of the consortium

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1. EXECUTIVE SUMMARY

The Legal guide for land rehabilitation and reclamation focuses on analyzing the legal framework regarding post-mining land reclamation at national (Greece, Poland, Germany) and European Union levels. The document provides a comparative analysis of existing regulations in different regions and presents the current legal situation in tabular form. These tables serve as a valuable checklist for stakeholders involved in the transformation process of coal regions and will be presented in the WINTER project's online tool as well. This analysis, due to the increasingly ambitious plans regarding the EU's climate neutrality and the possibility of using post-mining areas, has been enriched with a legal analysis for RES installations. Additionally, the legal guide suggests potential modifications to the legal frameworks based on the analysis and lessons drawn from the studied countries.

2. INTRODUCTION

Land rehabilitation and reclamation are critical aspects of managing the environmental impacts and legacy of mining activities. With the increasing global focus on sustainable development and the European Union's ambitious climate neutrality goals, effective land reclamation practices and strong legal frameworks are more important than ever. Recognizing the significance of these processes, both the European Union and its member states have developed and established legal structures to encourage and regulate land rehabilitation and reclamation projects at national and EU level.

This legal guide aims to provide an overview of the key legislation, policies, and regulations governing land rehabilitation and reclamation in Germany, Poland and Greece, as well as the wider EU context. The guide will examine the responsibilities of various stakeholders, as well as the legal mechanisms in place to enforce compliance and ensure the effectiveness of these efforts. It is worth mentioning that one of the innovative methods for land reclamation involves the deployment of renewable energy systems (RES) installations, which not only contribute to the restoration of degraded lands but also help meet the growing demand for clean and sustainable energy sources. Therefore, the analysis also includes legal aspects related to this activity.

First, European Union's legal framework will be analysed, which has been designed to support and harmonize the efforts of its member states in terms of land rehabilitation and reclamation. Key EU directives, such as the Environmental Liability Directive, the Industrial Emissions Directive and the Environmental Impact Assessment Directive, will be discussed to provide a comprehensive understanding of the overarching EU policies and regulations.

Next, the national legal frameworks of Germany, Poland and Greece will be studied, examining the specific legislation and regulations governing land rehabilitation and reclamation within each country.

Furthermore, a comparative analysis of the legal frameworks in Germany, Poland and Greece will be presented, identifying the similarities and differences in their approaches to land rehabilitation and reclamation. This analysis will shed light on the potential areas for improvement by proposing legislative changes in each country.

By providing a thorough understanding of the legal landscape surrounding land rehabilitation and reclamation in Greece, Poland, Germany, and the European Union, this guide will serve as a valuable resource for policymakers, practitioners, researchers, and other stakeholders involved in the sustainable management of land resources.

3. ANALYSIS OF THE LEGAL FRAMEWORK ON THE EUROPEAN LEVEL

At the beginning, it is worth noting that EU law does not directly regulate matters related to the reclamation of post-mining areas. The term of ‘rehabilitation’ is defined in Directive on the management of waste from extractive industries (2006/21/EC), in relation to waste facilities. According to this directive ‘rehabilitation’ means the treatment of the land affected by a waste facility in such a way as to restore the land to a satisfactory state, with particular regard to soil quality, wild life, natural habitats, freshwater systems, landscape and appropriate beneficial uses. At the same time, it should also be mentioned that despite the existence of many regulations on environmental issues related to water or air, soil protection has also never been properly regulated. In 2006, the European Commission proposed a "Thematic Strategy for Soil Protection", which included a "Proposal for establishing a framework for the protection of soil and amending Directive 2004/35/EC". However, this directive never entered into force. Then, in 2021, the European Commission published the "EU soil strategy for 2030” as part of the European Green Deal. This strategy is a kind of announcement of work on legal acts regulating this aspect of environmental protection.

Despite the lack of specific regulations, the reclamation of post-mining areas can be considered based on a number of other EU environmental directives, such as:

- Environmental Liability Directive (2004/35/EC),
- Industrial Emissions Directive (2010/75/EU),
- Mining Waste Directive (2006/21/EC),
- Landfill Directive (1999/31/EC),
- Mining Waste Directive (2006/21/EC),
- Environmental Impact Assessment (EIA) Directive (2011/92/EU),
- Water Framework Directive (2000/60/EC),
- Protected areas - Natura 2000.

Above-mentioned acts are important for the protection and rehabilitation of land and natural resources in Europe, contributing to sustainable development, and fostering a healthy environment for future generations.

As the need for energy transformation becomes increasingly urgent, legal measures regarding renewable energy may prove to be a crucial factor in the utilization of post-mining areas. The most important are the following documents:

- Renewable Energy Directive (2018/2001/EU),
- Energy Efficiency Directive (2012/27/EU),
- Electricity Market Regulation (2019/943/EU),
- EU Emissions Trading System (EU ETS),
- Regulation on the Governance of the Energy Union (2018/1999/EU).

In general, these acts and regulations have the potential to impact renewable energy installations by facilitating their growth, offering support mechanisms, encouraging energy efficiency, curbing greenhouse gas emissions, providing financial assistance, and ensuring their integration into the energy system.

The next section of this chapter will feature an overview of the relevant legal acts.

3.1. ACTS BEING IN FORCE – ENVIRONMENT

3.1.1. ENVIRONMENTAL LIABILITY DIRECTIVE (2004/35/EC)

The Environmental Liability Directive (ELD) establishes a comprehensive framework of environmental responsibility based on the **"polluter pays" principle**. Under this principle, the company responsible for environmental damage is accountable for taking necessary preventive and remedial measures, as well as bearing all associated costs. By EDL damage means a measurable adverse change in a natural resource or measurable impairment of a natural resource service which may occur directly or indirectly, and can be considered in the context of its impact on protected species and natural habitats, as well as water and soil. The scope of the EDL covers long list of activates, including: energy industries, production and processing of metals, mineral industries, and waste management.

The environmental threat and liability of operators are considered in two cases:

- case of imminent threat – the enterprise must immediately take preventive action;
- damage to the environment has already occurred - the company must promptly notify the authorities, take action to eliminate the risk and prevent further harm to the environment and human health.

The company must pay for all preventive and remedial actions, except in certain situations, i.e: when the damage resulted from a third party, despite adequate safety measures or occurred as a result of following official instructions). By holding companies financially responsible for the remediation of environmental damage, the ELD encourage them to prevent it from occurring in the first place.

3.1.2. INDUSTRIAL EMISSIONS DIRECTIVE (2010/75/EU)

Industrial production is a significant contributor to pollution in Europe, as a result of emissions of pollutants into the air, discharges of water waste, and waste generation. The Industrial Emissions Directive (IED) represents the primary legal instrument regulating the emission of pollutants in the EU. The objectives of the IED are to prevent and reduce harmful industrial emissions to water, air, and land, as well as preventing the generation of industrial waste. In order to achieve these objectives, industrial installations must prevent and reduce environmental pollution by applying the **Best Available Techniques (BAT)**. The BAT represents the most efficient techniques to prevent or reduce emissions that are technically feasible and economically viable in a given sector. The European Commission develops BAT reference documents (BREFs) to define BAT among different sectors at the EU level. These documents are a result of knowledge exchanges between experts from Member States, industry, and environmental organizations.

IED requires installations involved in the activities listed in Annex I to operate with a permit granted by the authorities of Member States. Permit conditions are based on BAT, with emphasis on the emission limit value for a particular industrial installation. However, in specific cases, permitting authorities may be flexible in dealing with emission limits if achieving a certain level of emissions would lead to disproportionately high costs compared to the environmental benefits.

The IED also requires environmental inspections at regular intervals. Member States must establish a system of environmental inspections and develop inspection plans accordingly. The

frequency of inspections is determined based on the level of risk and must take place at least once every 1-3 years.

The IED also considers the social aspect in the decision-making process, ensuring that the public has access to all information related to applications, environmental permits, and installation monitor results.

3.1.3. LANDFILL DIRECTIVE (1999/31/EC) AND AMENDING DIRECTIVE (EU) 2018/850

The EU introduced the Mining Waste Directive to prevent and mitigate negative impacts from waste storage on surface and ground water, soil, air, and human health. The directive categorizes landfill sites into three groups for hazardous, non-hazardous, and inert waste (waste that does not decompose or burn). Member States must establish national strategies to reduce progressively the amount of biodegradable waste going to landfills. Moreover, only previously treated waste can be landfilled under this directive.

Entities planning to store waste must obtain an appropriate permit. The permit application should contain information such as:

- the identity of the applicant,
- a description of the type and amount of waste to be landfilled;
- a description of the landfill, including its capacity and operating, monitoring and control plans;
- ways of preventing and reducing pollution;
- a description of the closure and after-care procedures.

To improve the quality of procedures, the EU introduced Directive (EU) 2018/850, which amends Directive 1999/31/EC. This directive is intended to regulate the transition to a circular economy and introduces limits on the scope and amount of waste storage.

3.1.4. MINING WASTE DIRECTIVE (2006/21/EC)

Mining waste constitutes a significant proportion of all waste produced in the EU and remains a topic of ongoing discussion. Extractive industries' exploitation of deposits is often accompanied by the extraction of waste rocks and their storage on the surface or in mining excavations, resulting in the production of mining waste. These wastes may pose a threat to the environment in some situations. To counteract this threat, the EU has introduced special regulations for the storage of waste from mining activities in the Mining Waste Directive.

The Directive defines mining waste as waste generated from extractive industries, including waste rock, overburden, and tailings resulting from the extraction and processing of mineral resources. The Directive applies to all mining facilities, regardless of the type of mineral extracted, the mining method used, or the location of the facility.

The key provisions of the Mining Waste Directive include:

- the requirement for mining companies to provide comprehensive waste management plans and to obtain permits for mining waste facilities.
- the establishment of design, operation, and closure criteria for mining waste facilities, including requirements for monitoring, inspections, and reporting.

- the obligation for Member States to develop national strategies for managing mining waste, including measures to prevent or reduce waste production, promote recycling and reuse, and ensure safe waste disposal.
- the requirement for Member States to ensure that financial guarantees are in place to cover the costs of closure and post-closure management of mining waste facilities.

3.1.5. ENVIRONMENTAL IMPACT ASSESSMENT (EIA) DIRECTIVE (2011/92/EU)

The purpose of the EIA Directive is to ensure a high level of environmental protection in EU countries. To achieve this goal, the directive requires environmental assessments to be conducted for certain public and private projects. The EIA encompasses projects such as sewage treatment plants, nuclear installations, airports, railway lines, and more, which are listed in Annexes I and II of the directive.

The process of environmental impact assessment (EIA) is a crucial aspect of environmental regulation, which is implemented in all member states. This process involves several key stages, which are as follows:

1) **Scoping**: During this stage, the project developer may request information from the competent authority regarding the scope of the project's EIA. This information will help the developer to identify the potential environmental impacts of the project and the relevant factors that need to be considered during the EIA.
2) **Preparation of the environmental impact report**: The project developer is required to provide complete and detailed information on the environmental impact of the proposed project. This report must be prepared in accordance with the guidelines outlined in Annex IV of the relevant directive.
3) **Consultation**: The information on environmental impact must be presented to environmental authorities, the public, as well as local and regional authorities. It should be noted that if the impact is international in the territory of another EU Member State, consultations must also be carried out in that country. The purpose of the consultation stage is to ensure that all relevant stakeholders are given the opportunity to provide feedback and input on the project's potential environmental impact.
4) **Decision**: The competent authority makes a decision on the project, taking into account the results of the consultation stage. This decision is based on the information provided in the environmental impact report and any feedback received during the consultation stage.
5) **Informing the public**: The authority responsible for making the decision must inform the public of the outcome.
6) **Challenge**: The public has the right to challenge the decision in courts within a certain period of time. This ensures that the decision-making process is transparent and accountable.

A key issue during the EIA is public consultation, which should be ensured at all stages of the process. Therefore, the environmental impact report and any other information must be communicated to the public as early as possible. Information about the project should also reach the widest possible audience (electronically, by local newspapers or on hanging posters).

3.1.6. WATER FRAMEWORK DIRECTIVE (2000/60/EC)

The Water Framework Directive is EU legal regulation adopted in 2000 with the aim of protecting and improving the quality of all water resources across the EU, including surface waters, groundwater and transitional waters. This legislation imposes obligations on national authorities and requires the preparation of River basin management plans. These plans are a key tool of the EU Water Framework Derivative for managing water resources at the river basin scale. A river basin is defined as the area of land drained by a river and its tributaries, and includes all the surface waters and groundwater with that area. The plans aim is to achieve good ecological and chemical status of all surface and groundwater bodies. Member states are required to review and update their River basin management plans every six years to ensure that they remain effective in achieving the environmental objectives of the WFD. In addition, member states are required to involve stakeholders and the public in the development and implementation of this plans and to ensure they are transparent and inclusive.

This Directive is only a framework related to the sustainable use of water resources. Apart from it, there are a number of water regulations with a more specific scope, including:

- Groundwater Directive (2006/118/EC),
- Urban Waste Water Treatment Directive (Council Directive 91/271/EEC),
- Water Reuse Regulation (EU) 2020/741,
- Drinking Water Directive (EU) 2020/2184) etc.

3.1.7. PROTECTED AREAS - NATURA 2000

Protected areas in the European Union are designated under the Natura 2000 network, which is a network of nature protection areas established to protect and conserve Europe's biodiversity. The Natura 2000 network includes both Special Protection Areas (SPAs) established under the **Birds Directive** (2009/147/EC) and Sites of Community Importance (SCIs) established under the **Habitat Directive** (92/43/EEC).

The Birds Directive was adopted in 1979 to protect wild bird species and their habitats. It requires EU member states to designate SPAs for the protection of wild bird populations and their habitats, and to implement measures to protect these areas from damaging activities.

The Habitat Directive was adopted in 1992 to protect natural habitats, species, and ecosystems. It requires EU member states to designate SCIs, which are areas that are home to rare or endangered species or habitats that need protection. Once an area is designated as an SCI, member states are required to undertake conservation measures to maintain or restore the habitats and species present in these areas.

Both the Birds and Habitat Directives are key components of the Natura 2000 network, which is an important part of the EU's strategy to conserve biodiversity and protect natural habitats. The network covers over 18% of the EU's land area and more than 8% of its marine area, making it one of the largest networks of protected areas in the world.

3.2. ACTS BEING IN FORCE – RENEWABLE ENERGY INSTALLATIONS

3.2.1. RENEWABLE ENERGY DIRECTIVE (2018/2001/EU)

The **Renewable Energy Directive (2018/2001/EU)** is a European Union regulation that aims to increase the use of renewable energy in the EU and to reduce greenhouse gas emissions. The directive sets binding targets for the share of renewable energy in the EU's final energy consumption and requires member states to take measures to promote the development and use of renewable energy sources.

The most important regulations under Renewable Energy Directive include:

- The requirement for member states to develop national renewable energy action plansthat outline the measures they will take to achieve the EU target;
- The obligation for member states to simplify administrative procedures and reduceregulatory barriers to the deployment of renewable energy;
- The requirement for member states to ensure that renewable energy is given priority access to the grid and priority dispatch over fossil fuels;
- The establishment of sustainability criteria for biofuels, bioliquids, and biomass, to ensure that their production does not cause deforestation, land-use change, or other negative environmental impacts;
- The promotion of cooperation between member states in the development of renewable energy, including the establishment of renewable energy projects of common interest.

3.2.2. ENERGY EFFICIENCY DIRECTIVE (2012/27/EU)

The **Energy Efficiency Directive (2012/27/EU)** is a European Union regulation that aims to increase energy efficiency in the EU and to reduce energy consumption. The directive sets binding targets for energy savings and requires member states to take measures to promote energy efficiency in all sectors of the economy. In 2018, the Directive was updated to the policy framework until 2030 and beyond. The Directive contains a binding target for the share of renewable energy in the EU's final energy consumption, set at 32% by 2030. However, as part of the European Green Deal and the EU aims to become the first climate-neutral continent by 2050, the European Commission has reviewed the energy Efficiency Directive and is going to set a new target of reducing greenhouse gases by at least 55% (compared to 1990) by 2030.

The key provisions of the Energy Efficiency Directive include:

- The establishment of a binding target for a 32% improvement in energy efficiency by 2030, compared to business-as-usual projections;
- The requirement for member states to develop national energy efficiency targets and plans, and to report on their progress in meeting these targets;
- The obligation for large companies to carry out energy audits and to implement cost-effective energy-saving measures;
- The promotion of energy efficiency in public buildings and in the public sector, including the establishment of energy performance standards and the use of energy-efficient procurement practices;

- The requirement for member states to establish energy efficiency obligations schemes, which require energy suppliers to achieve specified energy savings targets.

3.2.3. ELECTRICITY MARKET REGULATION (2019/943/EU)

The **Electricity Market Regulation (2019/943/EU)** is a European Union regulation that aims to promote the integration of renewable energy sources into the electricity market, to ensure security of supply, and to improve the functioning of the internal electricity market. The regulation establishes a framework for the operation of the electricity market in the EU and provides rules for the management of cross-border electricity flows.

The key provisions of the Electricity Market Regulation include:

- The establishment of a European electricity market, based on the principles of competition, market coupling, and cooperation between European Network of Transmission System Operators (ENTSO);
- The promotion of the integration of renewable energy sources into the electricity market, through the development of market-based mechanisms such as auctions and support schemes for renewable energy.
- The requirement for member states to ensure that demand response and energy storage are fully integrated into the electricity market, to enhance flexibility and reduce the need for conventional capacity.
- The establishment of rules for the management of cross-border electricity flows, including the development of capacity allocation and congestion management procedures.
- The requirement for TSOs to cooperate on the development of regional system operation plans, to ensure the security of supply and the efficient use of cross-border infrastructure.
- The promotion of active customer participation in the electricity market, through the development of consumer-centric market designs and the provision of transparent information on energy prices and consumption.

3.2.4. EU EMISSIONS TRADING SYSTEM (EU ETS)

The **EU Emissions Trading System** (ETS) is a regulatory mechanism implemented by the European Union to reduce greenhouse gas emissions. Under the ETS, companies in certain industries are allocated a certain number of carbon allowances, which they can trade with other companies. If a company exceeds its allocated allowances, it must purchase additional permits or face penalties. The goal of the ETS is to incentivize companies to reduce their carbon emissions and invest in low-carbon technologies. The system covers industries such as energy production, manufacturing, and aviation, and is the largest carbon market in the world.

3.2.5. REGULATION ON THE GOVERNANCE OF THE ENERGY UNION (2018/1999/EU)

Regulation (EU) 2018/1999 focuses on the governance of the energy union and climate action, with the primary aim of ensuring a coordinated and coherent implementation of the European Union's (EU) energy union strategy across its five dimensions:

- Security, solidarity and trust;

- A fully integrated internal energy market;
- Energy efficiency;
- Climate action, decarbonising the economy;
- Research, innovation and competitiveness.

Additionally, it strives to help the EU achieve its climate and energy objectives, specifically the targets set by the 2030 policy framework for climate and energy and the Paris Agreement on climate change. The regulation has several essential features:

1) It mandates EU Member States to:
    a) Develop national integrated energy and climate plans for 2021-2030 by December 31, 2019, followed by January 1, 2029, and every ten years thereafter.
    b) Prepare long-term low-emission strategies with a 50-year perspective, reporting them to the European Commission to contribute to broader sustainable development goals and the Paris Agreement's long-term goal.
    c) Generate biennial progress reports on plan implementation, starting from March 15, 2023, to track progress across the energy union's five dimensions.
2) The regulation establishes a recurring consultation process between the Commission and Member States, fostering regional cooperation between Member States, particularly before finalizing plans and then every ten years for subsequent 10-year periods. For the 2021-2030 period, plans must be updated by June 30, 2024.
3) It requires the Commission to monitor and assess Member States' progress towards the targets, objectives, and contributions outlined in their national plans.
4) The regulation stipulates requirements for national and EU inventory systems concerning greenhouse gas emissions, policies, measures, and projections.

4. ANALYSIS OF THE LEGAL FRAMEWORK IN GERMANY

In order to pursue a future land use on pre-used mining ground and therefore undergo a reclamation process, the main law to consider first in Germany is the Federal Mining Act (BBergG). This is due to the fact that the mining act constitutes the mine closure plan. It holds all measurements that are needed to prevent damage from others, originating from the decommissioning mine and its associated structured and past actions. Therefore, a mine closure plan is covering the reclamation of the surface as well. However, the BBergG serves more or less as a process framework towards the establishment, execution, and closure of mining activities. This framework is invigorated by multiple legislations, that have to be considered when assessing and approving mine operation or closure plans. Those legislations include the following issues, usually consisting of multiple acts, directives, and standards – some of them are addressed in the following chapters:

- Soil protection law
- Environmental and nature protection law
- Waste management law
- Water Law
- Occupational health and safety

As the major target of a mine closure plan is the release of mining supervision by the responsible mining authority thru accomplishing a sufficient state of reclamation, competent authorities are participating in the procedure to enforce specialized issues as listed above. Yet, to the extent of the pristine status of the land, the scope of necessary reclamation measurements is not unequivocally regulated. Additionally, mining companies are not allowed to support a future land use beyond the reclamation extensively, as this is prohibited by state aid law. Future land uses have to be created by the municipality and potential development agencies. However, mining companies are able of decoupling an independent subsidiary development company.

Taking this into account municipal affairs are affected since the municipality acts as responsible planning authority and as a result shapes a future land use, but within the mining closure plan process they remain passively involved.

Potential post-mining land uses are renewable energies or natural after uses. Especially the topic of renewable energies has gained momentum within the last year, not only because of the ongoing climate crisis, but with a view to the Russian war of aggression on Ukrainian territory. This multilevel conflict situation led to profound changes in German legal framework pushing the expansion of renewables and its linked transmission network.

Recent policies on federal level, as well as the translation of the latest (22.12.2022) EU emergency directive (EU 2022/2577) into federal law intend to accelerate planning processes in the energy sector to obtain relatively independency with regard to fossil fuels. Mourner of this legal adjustments is the environmental law. Hereafter planned areas providing space for renewable energy or necessary powerlines meet demands by executing a less detailed strategic environmental auditing within the designating planning (f. ex. a regional plan). As a result, the duty to carry out an environmental impact assessment (EIA) as well as a species conservation assessment can be dropped. Last-mentioned omission does not apply to solar power projects. The requirements of the habitat directive (92/43/EEC), the bird directive (2009/147/EC) and EIA directive (2011/92/EU) are overridden for the scope of the regulation.

The directive is implemented for wind energy plants and high voltage lines equal to 110 kV or higher after the 30th of June 2024 – even for projects which are already in an ongoing approval process. Operators and developers of PV plants are able to choose between the usual procedure and the facilitated one.

Over the last decades the substance of the Federal Mining Act has proven itself a reliable legal foundation for guiding the process towards a post mining landscape. Still, when it comes to right of approval with a view to power grid expansion and the comprehensive installation of renewable energies, the expansion didn’t match federal climate and energy objectives. The impact of the recent legal modifications remains to be seen.

At this point it needs to be addressed that in Germany, a federal republic with 16 states, legislative authority can be on federal and state level. For some types of competence there is an exclusive jurisdiction, which means only the federal government or a state’s government is allowed to enact a law on a specific topic. The Federal Mining Act is one of those laws. Other issues such as spatial planning and land law are part of the so-called competing jurisdiction. In this case both – federal and state government – are authorized to pass law within the same legal sphere. Therefore, there are various regulations on specific issues such as distance regulations for wind energy plants and plenty of other examples. Constitution-wise, in case of colliding norms the federal one is preferred by the judicial branch.

4.1. ACTS BEING IN FORCE

The following chapters contain the most important acts in regard to mining, post mining and renewable energies. Accordingly, the catalogue is not closed, as there are plenty of other acts to be complied with, such as the Federal Highway Act (FStrG) or the Federal Aviation Act. Yet, they are not as influential within our field of research and are excluded accordingly.

Furthermore, this chapter will not include DIN standards in detail, even though it needs to be mentioned that DIN standards are playing a major role in the technical realization of renewable energy projects and many other scientific, technical, or experience-based issues.

Most DIN standards are considered private regulations with recommendatory nature; however, legislators can levy a DIN standard as compulsorily via directive or an act. This is the case with the technical aspects of setting up a wind energy plant in some of the German states. One example will be given in chapter 5.1.4.4.

4.1.1. GEOLOGICAL AND MINING LAW

4.1.1.1. FEDERAL MINING ACT (BUNDESBERGGESETZ (BBERGG))

The Federal Mining Act regulates the whole cycle of mining, starting with the seeking of subsoil assets, the extraction of a resource until the closure of a mine respectively an opencast mine. The mining act is one of the few, if not the only special law that engages in personal property and land ownership. As a result of this peculiarity the act comprises the duty of reclamation to an initial status before mining actions took place. The economical and cautious handling of the soil and surface committing to sustainability is a basic principle of the act. It provides precautionary duties as for mining activities are likely to generate avoidable risks for different objects of protection. The Federal Mining Act is independent of other laws, but relies on other legal texts when it comes to realize its legal instruments such as operational or closing plans.

4.1.2. ENVIRONMENTAL LAW

4.1.2.1. GENERAL FEDERAL MINING ORDINANCE (ALLGEMEINE BUNDESBERGVERORDNUNG (ABBERGV))

As a translation of various ordinances of the European Union, the General Federal Mining Ordinance frames additional requirements for mining activities and associated facilities providing further security on multiple levels. Attachment 5 of the ordinance outlines the necessity of a waste management plan and the content of the tool.

4.1.2.2. FEDERAL SOIL PROTECTION ACT (BUNDES-BODENSCHUTZ-GESETZ (BBODSCHG))

Harmful soil modifications are the key term, the Federal Soil Protection Act evolves around. However, the act doesn't apply for areas treated by the Federal Mining Act and various other special laws, such as Circular Economy Act dealing with landfills and waste dumps. The Federal Soil Protection Act is still a very important legal text, as it provides clarification for unsettled legal terms within other acts. Therefore, a material control effect is given throughout the phase under mining supervision and beyond whilst developing post-mining land uses.

4.1.2.3. FEDERAL IMMISSION CONTROL ACT (BUNDES-IMMISSIONSSCHUTZGESETZ (BIMSCHG))

The elaborated title of the Federal Immission Control Act is Act on Protection against Harmful Effects on the Environment Caused by Air Pollution, Noise, Vibrations and Similar Processes.

This environmental law is not only relevant for the approval of projects relevant to incidents within the Federal Mining Act, such as certain parts of pit gas plants, it's also the major basis of approval for the wind energy plants. It contains different kinds of immission control for example plant-related or area related. Whereas the plant related immission control provides a regulatory structure for approval requirements for certain structures, the area related parts of the act approach preventive measurements. Accordingly, territorial authorities have to develop clean air and noise action plans for their area of responsibility.

4.1.2.4. FEDERAL NATURE CONSERVATION ACT (BUNDESNATURSCHUTZGESETZ (BNATSCHG))

The main legal groundwork for nature and landscape is authored in the Federal Nature Conservation Act. It contains important implements to enable conservation up to landscape-scale. For this purpose, it defines various categories of worth protecting landscape categories and the reasonable way to treat them. §34 BNatSchG regulates the compatibility and inadmissibility of projects, as well as the exceptions. This regulation comes into play in the approval or rejection of mining operating plans.

Furthermore, this act is becoming more relevant if a post-mining land use touches its regulatory content by serving a conservative purpose or engaging it.

4.1.2.5. CIRCULAR ECONOMY ACT (KREISLAUFWIRTSCHAFTSGESETZ (KRWG))

Compared to the General Federal Mining Ordinance, the Circular Economy Act is a higher-level legal text. However, the latter regulates the environmentally sound management of waste in general. Mining operations and waste management plans shall follow the requirements of this act.

Not finally backfilled hard coal waste dumps can be repurposed as landfill site after being released from the mining supervision. This post-mining land use falls back on the Circular Economy Act in combination with the lower-ranked Ordinance on Landfills and Long-Term Storage Facilities (Deponieverordnung (DepV).

4.1.2.6. LAW ON ENVIRONMENTAL IMPACT ASSESSMENT (GESETZ ÜBER DIE UMWELTVERTRÄGLICHKEITSPRÜFUNG (UVPG))

In the context of mining law procedures, the Law on Environmental Impact Assessment may come into play. Cases of application are, for example, the construction or operation of plants for the production of briquettes from lignite or hard coal as well as the operation of mine gas plants.

Given potential post-mining land uses, the Law on Environmental Impact Assessment may also apply, depending on the project. More detailed information on EIA in the context of renewable energies can be found in Annex 1

4.1.2.7. FEDERAL WATER ACT (WASSERHAUSHALTSGESETZ (WHG))

Water is constitutionally protected in Germany as a basis of life for present and future generations. For this reason, German environmental law often takes human health as its starting point among other protected goods, that can be affected among other things by mining activity.

Almost every mining activity interferes with the water balance - be it surface water or groundwater. Excavation waters also influence natural functions, even with regard to climatological aspects. The dovetailing of the Federal Water Act, mining and post-mining is thus imperative. As a result of decades of mining in the Ruhr region, eternal tasks have to be

performed. One of these is mine water management to prevent widespread flooding within mine subsidence.

4.1.3. SPATIAL LAW

4.1.3.1. FEDERAL BUILDING CODE (BAUGESETZBUCH (BAUGB))

The Federal Building Code is the most significant piece of building planning law, as it constitutes the general and special urban planning law. Urban planning law has the task of defining the legal quality of land and its usability. Thus, the building code includes the most important instruments and procedures to enable an orderly urban development. Urban land use planning forms the core of this. The subsequent use of mining brown fields – after being released from mining supervision – is largely determined by urban land use planning. Initial permit bases for land use as renewable energies, for example, are located here.

4.1.3.2. FEDERAL REGIONAL PLANNING ACT (RAUMORDNUNGSGESETZ (ROG)

This law deals with spatial planning and thus with the spatial development of a country, federal state or region. The most important instrument of spatial planning are the so-called spatial plans, which exist in different forms at all levels mentioned. These plans structure the spatial development for the area of responsibility of the authority drawing them up. The severity of the specifications depends on the scale of the plan. Priority areas for wind energy can and must now be included in regional plans at the regional level. Furthermore, the Federal Regional Planning Act allows for the review of significant infrastructure planning through a regional planning procedure. In addition to highway and waterway projects, this also includes the construction and expansion of power lines.

4.1.3.3. ADMINISTRATIVE PROCEDURES ACT (VERWALTUNGSVERFAHRENSGESETZ (VWVFG))

A large part of the executive bodies in the planning, licensing and supervision of mining and post-mining operations are public-law institutions. The Administrative Procedure Act contains rules for administrative action carried out by these institutions. In many cases, the assessment of legal actions is based on the forms of action of public administration. For this reason, this law plays an important role when, for example, a mining or planning authority participates. The planning approval procedure according to §§ 72 - 78 VwVfG also belongs to the administrative action according to the Administrative Procedure Act. Spatially significant projects such as the planning and construction of power lines, create tensions, which is why their permissibility is checked in advance by means of such a planning approval.

4.1.4. ENERGY LAW AND OTHER

4.1.4.1. GERMAN RENEWABLE ENERGY SURCES ACT (ERNEUERBARE-ENERGIEN-GESETZ (EEG))

The German Renewable Energies Act is a legal instrument for the promotion and feed-in of electricity from renewable sources. The EEG obliges grid operators to give priority to connecting electricity-generating plants to the grid that are not based on fossil fuels. Facilities for the generation of green energy can be subsidized on the basis of this law as long as they would not be economically viable on their own. Also, the feed-in of the electricity itself may be subsidized. This is done by apportioning it to the end consumer. However, the EEG is not only a basis for subsidies and approvals, it also sets expansion targets in gigawatts for wind and solar energy.

4.1.4.2. FEDERAL ENERGY ACT (ENERGIEWIRTSCHAFTSGESETZ (ENWG))

The Federal Energy Act contains general requirements for electricity generation, permitting, and grid operation.

4.1.4.3. WIND ENERGY REQUIREMENT ACT (WIND-AN-LAND-GESETZ (WINDBG))

The Wind Energy Area Requirements Act supports compliance with the expansion targets for wind energy set out in the Renewable Energy Sources Act by stipulating the mandatory designation of priority areas for wind energy. As a result, 0.8 percent of the country's land area must be set aside for wind turbines. By 2032, this figure is to be as high as 2 percent.

Due to the overriding public interest in the expansion of wind power, the approval procedures were adapted in agreement with the BNatSchG in order to achieve an accelerating effect. Landscape protection areas can now also be included in the expansion of wind energy.

4.1.4.4. GUIDELINE FOR WIND ENERGY PLANTS - EFFECTS AND STRUCTURAL STABILITY FOR TOWER AND FOUNDATION (RICHTLINIE FÜR WINDENERGIEANLAGEN EINWIRKUNGEN UND STANDSICHERHEITSNACHWEISE FÜR TURM UND GRÜNDUNG (RILI-WEA)

The Guideline for Wind Energy Plants - Effects and Structural Stability for Tower and Foundation is intended for the erection of wind energy plants and the verification of their stability. The guideline contains a list of important DIN standards and laws to be taken into account in the construction of wind energy plants. It has been adopted as binding national law.

4.2. SHORT CHARACTERIZATION OF THE MOST IMPORTANT ASPECTS INCLUDED IN THE DOCUMENTS FROM THE PROSPECTIVE OF AN END USER.

In the German legal system, as described in the analysis, there is a separation between mining law, which regulates the exploration, extraction, and completion of a resource exploitation project, and post-mining land uses, which are implemented after the release from mining supervision. This is important to keep in mind when we assume an end user perspective.

In principle, the operational closure plan from the Federal Mining Act makes use of the laws and guidelines of German environmental law, but the responsible mining company is only obliged to carry out the reclamation to a certain extent. The decisive factors here are, on the one hand, hazard prevention and on the other (economic) remediation. This means in consequence that the establishment of any post-mining land use can require additional reclamation work. The scope here is based on the land use to be achieved.

If, for example, a wind energy plant is to be erected on a mining dump, it is not the task of the formerly responsible mining company to ensure the statics of the dump. This is the responsibility of the new investor or developer, i.e., the end user. This may include, among other things, environmental, soil or statics expertise. Basically, the same laws apply as in the implementation of the final operating plan, but the interpretation of the laws, in particular environmental and building law, is now based on the new land use to be established.

5. ANALYSIS OF THE LEGAL FRAMEWORK IN POLAND

Poland has a long history in the mining industry, resulting in many areas requiring reclamation efforts. The Polish legal framework provides regulations and guidelines to ensure that mining companies undertake appropriate reclamation measures, which can help to reduce the negative environmental impacts of mining activities. This chapter provides an analysis of the legal framework related to the reclamation of post-mining areas in Poland. Specifically, we will

examine the key laws, regulations, and policies that govern the reclamation process, as well as the roles and responsibilities of relevant stakeholders, such as mining companies, regulatory agencies, and local communities.

In Polish law, it is difficult to indicate one act that would fully regulate the reclamation process. However, two legal acts provide a framework for these activities. Firstly, it is the **Geological and Mining Law**, which places an obligation of reclamation in the event of liquidation of a mining facility (or its parts) on the entrepreneur. The second important is **Act on the protection of agricultural and forest lands**, which obliges the person causing the loss or reduction of the value in use of land to reclamation. Both laws will be discussed later in this chapter. In addition to the regulations mentioned above, it is important to consider other acts related to the environment, spatial development, and energy when discussing reclamation of post-mining areas. For this reason, this chapter has been divided into 4 parts:

- Geological and Mining regulations;
- Environmental regulations;
- Spatial regulations;
- Energy and other regulations.

5.1. ACTS BEING IN FORCE

5.1.1. GEOLOGICAL AND MINING LAW

5.1.1.1. GEOLOGICAL AND MINING LAW

The Polish Mining and Geological Law serves as a fundamental legal framework governing the ownership, management, supervision, and liability of mining operations, including post-mining reclamation. Under the law, mining **entrepreneurs** possessing the necessary **licenses** are obligated to undertake measures to protect the environment and carry out land reclamation following the total or partial liquidation of a mining facility. It is important to note that the expiration, withdrawal, or loss of a concession does not relieve entrepreneurs of their responsibility to fulfil environmental protection measures and conduct proper liquidation of the mining facility.

The law also mandates the submission of **financial guarantees** to ensure that adequate funds are available to finance reclamation efforts. The legislation specifies **penalties** for individuals who fail to comply with their obligations related to the closure of a mining plant or its components, which includes taking necessary actions to safeguard the environment and reclaim the land following mining operations.

The legislative requirements necessitate the creation of operational plans for a mining plant, as well as plans for a liquidated mining plant. These plans outline various details, including the specific methods and procedures for performing obligations related to land reclamation after mining activities. The mining plan is prepared by the entrepreneur for each mining plant and must be approved by the relevant mining supervision authority through a decision-making process. The plan is designed to cover a period of 2 to 6 years or for the entire anticipated operational period if that period is shorter.

5.1.1.2. REGULATION OF THE MINISTER OF THE ENVIRONMENT ON MINING PLANT OPERATION PLANS

The Geological and Mining Law mandates the creation of **mining plant operation plans**. Therefore, to fully understand the scope of duties during reclamation, it is crucial to analyze the content of the mining plant operation plan. The Regulation of the Minister of the Environment on mining plant operation plans specifies the detailed requirements for the operation plan of a liquidated plant or its designated part. The regulation's appendices outline the specific requirements for the content of the operation plan, for various types of activities, including: underground mines, opencast mines, boreholes mines, underground non-reservoir storage of substances, underground waste storage, or a mining plant conducting underground storage carbon dioxide.

As an example, the **operation plan for a liquidated opencast mining plant** should contain details about the decommissioning period, including specific dates for the commencement and completion of the decommissioning process and land reclamation after mining activity. The plan must also address environmental issues, such as preventing and removing damage caused by mining and construction, land reclamation after mining activity, counteracting changes in water conditions, waste management, water and wastewater management, air protection against pollution, and protection against noise and vibrations.

5.1.1.3. REGULATIONS ON THE OPERATION OF MINING PLANTS

In accordance with the Geological and Mining Law, regulations have been issued that require the Minister of the Environment to define the requirements for operating different types of mining plants. Based on these provisions, the following regulations have been created:

- Regulation on the operation of underground mines;
- Regulation on the operation of boreholes mines;
- Regulation on opencast mining operations (described in this analysis).

The abovementioned regulations require the preparation of **reclamation documentation**, which outlines the specific measures for restoring post-mining areas to their original state.

For instance, in the case of opencast mining plants, the documentation specifies the direction, scope, manner, and date of reclamation, including the initial state of the land, location of building structures, methods of shaping the terrain and restoring soil, and measures to regulate water relations and prevent erosion. The documentation also includes a schedule of reclamation works and details on securing unused mineral deposits. It is important to note that regulations on reclamation documentation do not apply to land reclamation in opencast mining plants that extract minerals based on a license granted by the staroste (district government officer in Polish administration), except for cases where reclamation is performed using waste from outside the mining plant.

5.1.1.4. MINING WASTE ACT

It is important to note the provisions for reclamation under the Mining Waste Act. This Act governs the recultivation of **mining waste disposal facilities**. Such a facility is defined as a place for storing mining waste in a solid, liquid, solution, or suspension form, including heaps and tailing ponds, as well as dams or other structures used to contain, retain, limit, or reinforce such a facility. However, a mining excavation filled with mining waste for reclamation and technological purposes is not considered a mining waste disposal facility.

The Act requires the holder of mining waste to prepare a mining waste management program that includes a plan for closing the mining waste disposal facility, including procedures for land reclamation and post-closure monitoring. The program should be submitted to the voivode marshal or staroste.

5.1.2. ENVIRONMENTAL LAW

5.1.2.1. AGRICULTURAL AND FORESTED LAND PROTECTION ACT

The Agricultural and Forest Land Protection Law outlines the principles of protecting forest and agricultural land, as well as the reclamation and improvement of land value. It includes a definition of **reclamation**, which involves restoring or providing utility and natural values to degraded or devastated land through proper terrain shaping, improving physical and chemical properties, regulating water relations, restoring soils, strengthening slopes, and constructing or reconstructing necessary roads.

The Act distinguishes two situations with regard to entities obliged to carry out reclamation:

1. When the person causing the loss or limitation of the land's usefulness has been **identified**. In such a situation, the obligation to reclaim the land at their own expense lies with that person or entity.
2. When the land has been devastated or degraded by **unidentified** persons, natural disasters, or mass movements of soil. In this case, the obligation to reclaim the land lies with the appropriate authority, depending on the type of land.

Land reclamation and development is a crucial aspect of industrial activity, which is planned, designed, and implemented at all stages. The process involves restoring the degraded land to its original state by shaping the terrain, improving soil properties, regulating water relations, and constructing necessary infrastructure. Land reclamation must be carried out **within 5 years** from the cessation of industrial activity, and in areas where land subsidence is expected, reclamation is initiated before degradation occurs at the request of the owner. Failure to complete the process within the given period is associated with financial sanctions, such as an increased annual fee.

The reclamation process is primarily overseen by the staroste, who has significant authority in this regard. This includes issuing a **decision on reclamation and development**, as well as determining the direction of the reclamation process and confirming its completion.

5.1.2.2. ACT ON THE PROVISION OF INFORMATION ON THE ENVIRONMENT AND ITS PROTECTION, PUBLIC PARTICIPATION IN ENVIRONMENTAL PROTECTION AND ENVIRONMENTAL IMPACT ASSESSMENT

To assess the environmental impact of the reclamation process, the provisions on environmental impact assessment of the project should be applied. In the Polish legal system, projects that require an environmental impact assessment are defined in the Act on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessment. Although the list of projects in the Act does not explicitly include a reclamation project, these regulations may refer to specific reclamation methods, such as afforestation or revitalization of ponds.

The environmental impact assessment of a project is a crucial procedure that evaluates its impact on the environment and human health. To ensure transparency and accountability, public participation must be guaranteed throughout the process. In Poland, the administrative

authorities responsible for environmental impact assessments are, in the vast majority of cases, executive authority of the commune, i.e. the commune head, mayor, city president or Regional Directorate for Environmental Protection. In certain cases, the competent authority may also be the General Director for Environmental Protection, the staroste or the director of the regional directorate of the State Forests.

5.1.2.3. ENVIRONMENTAL PROTECTION LAW

The Environmental Protection Law in Poland is a comprehensive set of regulations aimed at safeguarding natural resources, controlling the introduction of substances and energy into the environment, and establishing the costs associated with environmental use. The law outlines the responsibilities of administrative bodies and individual entities, as well as the potential sanctions for noncompliance.

When it comes to reclamation, the law mandates that study and local plans should be designed to maintain a natural balance and promote the rational management of environmental resources. This can be achieved by establishing programs for the rational use of land, particularly in areas of mineral deposit exploitation. Such programs must take into account the areas where mineral deposits occur, as well as the current and future needs for exploitation of these resources.

5.1.2.4. ACT ON THE PREVENTION AND REPAIR OF DAMAGE TO THE ENVIRONMENT

The Act defines the rules of responsibility for the prevention of environmental damage and the remediation of environmental damage. According to the Act, damage to the environment is a negative, measurable change in the state or function of natural elements, assessed in relation to the initial state, which was caused directly or indirectly by the activity of the entity using the environment.

5.1.2.5. WATER LAW

At the outset, it should be noted that there are no detailed regulations specifying the requirements for groundwater after the reclamation process, including mining reclamation. Only general regulations concerning the status of all waters, including underground waters, apply.

The Water Law governs the reclamation of both surface and underground waters. Unless otherwise specified by the Act, obtaining a water law permit is mandatory for the reclamation of surface waters or groundwater. The competent authorities responsible for issuing water law permits is Państwowe Gospodarstwo Wodne Wody Polskie (State Water Holding – Polish Waters). The permit outlines the obligations required to protect environmental resources, the interests of the population and the economy, and the necessary projects to limit the negative impact on the environment within the scope of the intended use of water or water facilities.

5.1.3. SPATIAL LAW

In terms of reclamation and its planning at the local level, two basic acts of spatial planning are adopted: the Study of Conditions and Directions of Spatial Development of a Commune and the Local Spatial Development Plan.

5.1.3.1. STUDY OF CONDITIONS AND DIRECTIONS OF SPATIAL DEVELOPMENT OF A COMMUNE

The main planning act used to implement spatial policy and determine local rules for spatial development is the Study of Conditions and Directions of Spatial Development of a Commune. This study is mandatory in every commune, but it is not a local law act, only an internal policy

act for the commune. The study provides guidelines for planning in the form of local plans, which correspond to the needs of the commune as a whole. However, the study does not provide as much detail as a Local Spatial Development Plan, which is the only planning act that is a source of generally applicable law. The study identifies areas attractive for investment, tourism, natural resources, and informs about the commune's intentions for the specific area. The scope of the minimum requirements to be taken into account when developing the study is indicated in the Spatial Planning and Development Act. The study includes elements such as areas for which the commune intends to draw up a local spatial development plan, areas requiring transformation, rehabilitation, reclamation or remediation, and degraded areas.

5.1.3.2. LOCAL SPATIAL DEVELOPMENT PLAN

The Local Spatial Development Plan plays a critical role as an instrument of the spatial planning system. It is an act of local law adopted in the form of a resolution of the commune council, specifying the intended use, conditions for land development and development, as well as the location of public purpose investments. It consists of a text part (resolution) and a graphic part (annex to the resolution). On the basis of these Plans, all building permits are obtained.

In the context of mining activity, it should be noted that it may be conducted only if it does not violate the purpose of the real estate specified in the local spatial development plan, and in the absence of a local spatial development plan, mining is allowed only if it does not violate the use of the real estate established in the study of conditions and - terms of spatial development of the commune. Local development plans are required to take into account documented mineral deposits as well as mining regions and areas. Mining area is the area covered by the predicted harmful effects of mining works of a mining plant. The mining region, on the other hand, is the space within which the entrepreneur is entitled to extract minerals and conduct mining works necessary to perform the concession.

Although the Agricultural and Forest Land Act does not require the consideration of Local Spatial Development Plans when determining reclamation directions, it is necessary to take them into account according to jurisprudence. This means that the staroste, who issues the decision on the directions of reclamation and development, should not act in opposition to the provisions of local spatial development plans. In this context the commune self-government plays a significant role in determining the direction of reclamation and ensuring compliance with the established guidelines and regulations.

5.1.4. ENERGY LAW AND OTHER

5.1.4.1. ENERGY LAW

The Energy Law serves as a fundamental legal act that regulates the state's energy policy and sets standards and conditions for the production, supply, and use of fuels and energy. It also establishes the framework for the operation of energy companies and outlines the responsibilities of the relevant authorities. Although this law does not explicitly address renewable energy sources in detail, it does make provisions for them. For instance, energy companies that are responsible for transmitting or distributing energy are required to enter into network connection agreements with entities seeking connection to the network on a fair and equal basis. Priority is given to installations that use renewable energy sources, provided that technical and economic conditions allow for connection to the network and energy supply. To apply for a network connection, entities must submit an application to the relevant energy company, using a standardized form that is provided by the company.

5.1.4.2. RENEWABLE ENERGY SOURCES ACT

The Polish Renewable Energy Sources Act is a legal framework that governs the development, integration, and promotion of renewable energy sources in Poland. The main objectives of the RES Act are to increase the share of renewable energy in the national energy mix, reduce greenhouse gas emissions, and promote sustainable development of the energy sector. The RES Act sets out rules and regulations for the production, distribution, and use of energy from renewable sources, and provides financial incentives to support the development of renewable energy projects.

Another important aspect of the RES Act is its support mechanisms for renewable energy projects. These include feed-in tariffs, which provide guaranteed prices for renewable energy generated by RES installations; certificates of origin, which certify the origin of the energy and can be traded on the energy market; and auctions, which allow RES project developers to bid for support from the government.

The RES Act also establishes a licensing regime for large RES installations above 1 MW, which requires developers to obtain a license from the Energy Regulatory Office (ERO) before construction and operation. The licensing process involves demonstrating compliance with technical, environmental, and economic requirements as stipulated in the RES Act.

5.1.4.3. REGULATIONS RELATING TO THE LOCATION OF RES INSTALLATIONS

Local Spatial Development Plan
The Spatial Planning and Development Act is the main regulation that governs the location of renewable energy sources. According to this act, if a commune intends to designate areas for the installation of renewable energy devices with a capacity exceeding 500 kW, along with their protective zones that involve restrictions on land use and development, a study of the conditions and directions of spatial development must be conducted to establish the distribution of these installations.

Wind Farm Investment Act
The Wind Farm Investment Act is a key piece of legislation in Poland that outlines the guidelines for the construction and location of wind farms, including the required distance from existing or planned residential areas. In March 2023, an amendment to the act was signed, which introduced new regulations regarding the minimum distance between wind farms and residential areas. Under these new regulations, the minimum distance will be 700 meters.

However, it is important to note that there are some exceptions to this rule. For example, wind farms are not permitted to be erected in certain areas designated for nature conservation purposes, such as national parks, nature reserves, landscape parks, and Natura 2000 areas. Additionally, the minimum distance from national parks will be determined by the 10H rule, which means that the distance must be equal to ten times the height of the wind turbine.

Construction Law
It is worth noting that, in Poland, there are no specific laws or regulations that govern the placement of renewable energy installations, aside from wind farms. For non-wind RES projects, the provisions of the Construction Law apply. This means that renewable energy installations, such as solar panels or biomass power plants, must comply with the standard regulations and requirements for construction and location set out in the Construction Law.

5.2. SHORT CHARACTERIZATION OF THE MOST IMPORTANT ASPECTS INCLUDED IN THE DOCUMENTS FROM THE PROSPECTIVE OF AN END USER

5.2.1. REHABILITATION LEGISLATION

In Poland, a well-defined legal framework establishes regulations and guidelines to ensure that mining companies undertake proper reclamation measures, minimizing negative environmental consequences. The reclamation process is primarily governed by two significant legal acts: the **Geological and Mining Law** and the **Agricultural and Forest Land Protection Law**.

Reclamation efforts must commence within five years following the cessation of industrial activity. Failure to adhere to this timeline may result in the imposition of financial penalties. The reclamation process is mostly supervised by the staroste, a local administrative authority responsible for issuing decisions on reclamation and development.

In the context of post-mining area reclamation, conducting an environmental impact assessment becomes particularly significant in specific instances. Local spatial development plans serve a crucial function in delineating the intended land use and establishing conditions for development.

For further elaboration on particular legal issues, refer to Table 3 in Annex 1.

5.2.2. RES

Poland's legal framework for renewable energy sources is primarily composed of the Energy Law and the Renewable Energy Sources Act, supplemented by regulations found in the Spatial Planning and Development Act, the Wind Farm Investment Act, and the Construction Law. These acts collectively govern the development, integration, promotion, and location of RES installations in Poland, outlining specific support mechanisms and licensing requirements for projects. While exploring the potential for reclaiming post-mining areas using renewable energy sources, it is essential to consider the environmental impact assessment. A notable 2023 amendment established new regulations for the minimum distance between wind farms and residential areas, set at 700 meters. For detailed information on selected aspects of RES installations, refer to Table 4 in Annex 1.

6. ANALYSIS OF THE LEGAL FRAMEWORK IN GREECE

The core of the Greek legal framework regarding mine rehabilitation/reclamation and land use is the environmental licensing legislation and to some extent the Mining Code and other relevant laws. Future projects and activities with environmental impacts must obtain an **Environmental Terms Approval Decision (AEPO in Greek)**, after the prepared **Environmental Impact Assessment (MPE in Greek)** studies are approved. All measured, methods and aspects of reclamation, including waste management, must be described and analyzed in the MPE studies, which are carried out **before** operation. Any post-mining land use requires the obtainment of a new AEPO, which in turn requires new MPE studies and their approval.

In Greece, great effort has been made to apply clean energy technologies as a means of energy production, so as to facilitate the Transition and ensure the country's energy security and efficiency. In this light, many RES projects are being planned and some have already been installed in regions in Transition ("Delignification Zones"). The Greek legal framework includes a variety of spatial criteria for RES installation, especially for wind farms and solar parks.

Delignification Zones are post-mining landscapes, therefore the same environmental laws apply to them, but they are also part of the wider Transition framework. Since lignite mining and the production of electricity is an integral part of these regions' economy, special laws have been introduced in the recent years regarding their management and the plans for their post-mining uses, including RES.

6.1. ACTS BEING IN FORCE

6.1.1. GEOLOGICAL AND MINING LAW

The main Greek legislation on mining, waste management and rehabilitation activities is the Mining Code ("KMLE"), as well as the law for waste management that follows the relevant European Directive.

6.1.1.1. MINING CODE (MINISTERIAL DECISION D7/A/OIK. 12050/2223/2011 "REGULATION ON MINING AND QUARRYING OPERATIONS"

In Greece, the main legal framework related to rehabilitation and reclamation practices in former mines is the Mining Code ("KMLE", Ministerial Decision 2223-FEK1227/14-6-2011), which the Greek legislation for all is mining and quarrying activities. According to the Article 89 of the Mining Code, all mining and quarrying activities should be planned and implemented in a manner that ensures minimum environmental disturbance and apply measures for the prevention or decrease of any type of environmental impacts, especially on the air, the water, the soil, the flora and fauna, the landscape and human health. Selected provisions from the Mining Code are presented below.

The law outlines that location and method of disposal, as well as the final structure of the mining waste deposits, must be chosen during the preparation of the technical study, in order to ensure the rational operation of the project, the stability of the slopes (with compaction of the material, where necessary) or dams, where appropriate, and the possibility of restoring the landscape.

Moreover, the Mining Code establishes the companies that operate the mines are responsible for the environmental protection of the mining areas and are obliged to implement environmental protection measures in collaboration with the competent governmental and regional authorities. These measures must be applied as early in the mining operation as possible in order for the rehabilitation processes to be completed on time. The operator is obliged to apply Best Available Techniques (BAT) during the exploration, extraction and disposal of waste (mining and non-mining).

The Mining Code also highlights the importance of taking special measures for the rehabilitation of mining areas. The positioning of any intervention (location and orientation) must be chosen in such a way as to cause the least possible aesthetic disturbance to the landscape. If the choice of location cannot produce a satisfactory result, effort should be made to conceal the intervention artificially (green zones, embankments, etc.).

Extraction and disposal of the plant land should be carried out separately and kept suitable for future reuse. The final form of restoration should be in harmony with the wider environment and, in the case of public, municipal or communal land, provision should be made for meeting local needs for specific land uses, in accordance with the written recommendations of the regional and local authorities. The restoration of the farm grades to be carried out gradually and not to be destroyed after the end of the project.

The technical study must include a timetable for environmental rehabilitation work, if no exploitation is to follow within a reasonable period of time, as well as a detailed budget of the

amount of the investment (including the amount corresponding to the environmental restoration) and the operation costs.

Regarding waste management, the location and method of disposal and the final configuration of the tailings disposal facilities must be chosen in the preparation of the technical study, in order to ensure the rational operation of the project, the stability of the slopes (with compaction of the material, where necessary) or dams, where appropriate, and the possibility of restoring the landscape.

In the case of addressing the environmental impacts and waste facilities, which are the subject of the Environmental Impact Assessment, only a brief reference and reference to the Environmental Impact Assessment is made.

6.1.2. ENVIRONMENTAL LAW

The following section includes Laws and Ministerial Decisions regarding matters of environmental licensing (in chronological order) for various works and activities of different scales. It is important to note that Greece has updated its legislation to European standards and Directives regarding all these issues.

6.1.2.1. LAW 4014/2011 ENVIRONMENTAL LICENSING OF PROJECTS AND ACTIVITIES, REGULATION OF ARBITRARY BUILDINGS IN CONNECTION WITH THE CREATION OF AN ENVIRONMENTAL BALANCE AND OTHER PROVISIONS UNDER THE RESPONSIBILITY OF THE MINISTRY OF ENVIRONMENT

This law mentions the environmental licensing procedure with the conduct of an Environmental Impact Assessment (MPE), the assessment procedure, the issuance of an Environmental Terms Approval Decision (AEPO), as well as the control bodies for compliance with environmental commitments. For projects located in Natura 2000 sites, Special Ecological Assessment studies are also prepared. The AEPO sets out, inter alia, remedial or preventive measures and actions to monitor environmental media and parameters to avoid or minimise impacts or to remedy or restore the environment. The AEPO is usually valid for a period of 10-15 years, depending on the project, after which a renewal is required.

6.1.2.2. MINISTERIAL DECISION 170225/2014 SPECIFICATION OF THE CONTENT OF THE APPLICATIONS FOR ENVIRONMENTAL LICENSING OF WORKS AND ACTIVITIES OF CATEGORY A’

This Ministerial Decision defines the contents of the environmental studies for projects and activities (Law 4014/2011, Ministerial Decision YPEN/DIPA/17185/1069/2022) and more specifically the Environmental Impact Assessment (MPE), the Special Ecological Assessment (for projects located in Natura 2000 areas) and the environmental studies concerning the amendment or renewal of the AEPO of a project or activity. In general, these studies include information such as the existing situation of the area where the project will take place and the project's impact on the environment (such as water, soil, flora, fauna, etc.). These studies are mandatory for the granting of an environmental permit and the initial issuance of an AEPO after their assessment by the competent body.

More specifically, in the category of mining projects, the restoration of vegetation affected at all stages of the project is referred to (exploration, operation, closure), such as: slope configuration, deposition of mining waste, deposition of soil material, planting, appropriate plant species and planting, maintenance of plantations, cost of restoration, works to minimise aesthetic disturbance.

6.1.2.3. MINISTERIAL DECISION 46294/2013 STANDARD ENVIRONMENTAL COMMITMENTS FOR WORKS AND ACTIVITIES OF CATEGORY B OF THE 5TH GROUP "EXTRACTIVE AND OTHER RELEVANT ACTIVITIES"

The rehabilitation works are to be carried out in cooperation between the project operator and the relevant Forestry Service.

Exploration
The operator has to collect and preserve the soil material (plant soil, etc.) that will be produced during the implementation of the exploration works in a suitable location so that it can be used for rehabilitation. The rehabilitation works are to be carried out immediately after the end of the exploration works at each planned location. Prior to rehabilitation, the barren material must be returned to the excavation cavities. Subsequently, planting soil or clay of good quality and appropriate thickness should be deposited both at the survey sites and at the sites of temporary deposition of barren material.

Plantations
Plantations should use species that thrive in the soil and climate conditions of the area. These should be maintained and replaced when they are destroyed for any reason so that the plantation success rate is at least 80%. Maintenance work should continue until the plants can grow without additional care.

6.1.2.4. MINISTERIAL DECISION 3791/2013 STANDARD ENVIRONMENTAL COMMITMENTS FOR RENEWABLE ENERGY RESOURCES WORKS AND ACTIVITIES CLASSIFIED IN CATEGORY B OF THE 10TH GROUP "RENEWABLE ENERGY RESOURCES"

The purpose of this Ministerial Decision is to establish environmental conditions and restrictions during the construction and operation phase of category B of group 10 (RES projects). It refers to small-scale wind, photovoltaic and hydroelectric projects and defines the environmental conditions concerning their construction, operation, decommissioning and waste management.

6.1.2.5. MINISTERIAL DECISION YPEN/DIPA/17185/1069/2022 CLASSIFICATION OF PUBLIC AND PRIVATE WORKS AND ACTIVITIES IN CATEGORIES AND SUBCATEGORIES

Groups of public and private projects and activities where environmental permitting is required (according to categories of rehabilitation/reclamation works defined in deliverable 2.1) are outlined below:

Group 1: Roads, airports/airfields;

Group 2: Water reservoirs, conversion of lands to agricultural lands, enrichment of underground water reservoirs;

Group 3: All types of ports (for civil, touristic, commercial and industrial purposes);

Group 4: Industrial waste facilities, municipal waste facilities (storage and/or processing), recycling facilities;

Group 5: Exploration and mining of energy minerals, mining waste management facilities

Group 6: All tourist facilities (e.g. hotels, camps, ski resorts), urban development

(conference centres, excibition centres, sports facilities, health facilities, thematic parks, culture (cultural centres, museums, cinemas & theatres, education/training centres

Group 7: Poultry farms

Group 8: Fish farms

Group 9: Industrial facilities (waste storage, new industries)

Group 10: Onshore and offshore wind farms & solar parks, floating solar parks on sea, artificial lakes and pit lakes, hydroelectric plants, hybrid power stations, biogas and biomass power plants, power storage plants, hydrogen energy storage (not production). Activities are divided in three different categories depending on capacity

Group 11: All types and sizes of fuel pipelines and their supporting infrastructure, natural gas pipelines and storage, CO2 transport and storage, liquid fuel storage, refueling stations, surface and submarine electricity transmission network

Group 12: Soil sanitation and remediation for agricultural land use. The law includes specifically remediation and rehabilitation works and landscaping in former lignite mines in order to prepare them for agricultural use or reforestation.

6.1.2.6. LAW 4964/2022 PROVISIONS FOR THE SIMPLIFICATION OF ENVIRONMENTAL LICENSING, ADOPTION OF LEGAL FRAMEWORK FOR THE DEVELOPMENT OF OFFSHORE WIND FARMS, THE RESPONSE TO ENERGY CRISIS, THE PROTECTION OF THE ENVIRONMENT AND OTHER PROVISIONS

The law refers to the simplification of the procedure for updating or amending an AEPO (Law 4014/2011).

6.1.3. SPATIAL LAW

This section describes the legal framework regarding the Spatial Planning and criteria related to RES installation. Wind farms and solar parks installation criteria are given in detail, depending on the scale of the projects, as well as their spatial relationships with other features of the potential installation areas and the limitations that are required by the law. It is very important to note that there is no specific legislation regarding hydrogen yet and that the relevant European directives are being implemented instead, for the time being.

6.1.3.1. APPROVAL OF SPECIAL LEGAL FRAMEWORK OF SPATIAL PLANNING AND SUSTAINABLE DEVELOPMENT OF RENEWABLE ENERGY RESOURCES (RES) AND ITS STRATEGIC ENVIRONMENTAL IMPACT ASSESSMENT STUDY

Notably, the Approval of special legal framework of Spatial Planning and Sustainable Development of Renewable Energy Resources (RES) and its strategic Environmental Impact Assessment Study highlight several significant issues, including:

- Special criteria for site selection of onshore wind farms

- Criteria for the site selection of solar energy installations
- Site rehabilitation

Holders of licenses to operate installations for the production of electricity from renewable energy sources will be required to rehabilitate at their own expense and in accordance with the approved environmental conditions the relevant sites before the installation ceases to operate in any way, ensuring in particular the dismantling and safe removal of installations, the restoration of native vegetation and the general rehabilitation of the site to its previous state, provided that this is technically feasible (HWEA, 2018).

6.1.3.2. MAIN CRITERIA FOR RES INSTALLATION

Wind farms

The environmental classification of wind projects is determined by their nominal capacity and whether they are located within a protected area. According to Ministerial Decision no. 1958/2012 and its modifications, the environmental categories for wind energy projects are set out as follows:

- *Environmental* ***Category A***: It includes two sub-categories as follows:
    - *Sub-category A1* includes projects:
        - ✓ with installed capacity greater than 45 MW, or
        - ✓ with installed capacity greater than 35 MW and either located in protected areas (Natura 2000 Network etc.) or including the construction of a High Voltage Line of a length longer than 20 km

For sub-category A1, the responsible licensing authority for the evaluation of MPE study is the Special Environment Authority (“EYPE” in Greek) of Ministry of Environment, Energy and Climate Change and the MPE Study is approved via a Ministerial Decision.

    - *Sub-category A2* includes projects:

        - ✓ with installed capacity between 6,5 MW – 45 MW and
        - ✓ including the construction of a High Voltage Line of a length shorter than 20 km

For sub-category A2, the responsible licensing authority for the evaluation of MPE study is the Regional Directorate of Environment of the Decentralized Administration of the area where the project is planned to be installed and the MPE is approved via a Decision of the General Secretary of the Decentralized Administration.

- *Environmental* ***Category B*** includes projects:

        - ✓ with installed capacity between 0,02 MW – 6,5 MW
        - ✓ with installed capacity less than 0,02 MW and either located in protected areas (Natura 2000 Network etc.)

For Category B, the project operator may request the inclusion of the project in Standard Environmental Commitments from the Directorate of Environment and Spatial Planning of the relevant Prefecture after the approval of the production permit and before the approval of the final connection offer by the competent operator.

Table 1 Distances of wind installations from adjacent land uses, activities and technical infrastructure networks, according to the Special Framework for Spatial Planning and Sustainable Development (EPHSAA) (Ministerial Decision 49828/2008 - FEK 2464/B/3-12-2008, Annex II)

A. Distances to ensure the functionality and efficiency of wind installations	
Unconventional use	**Minimum distance based on the Special Framework for Spatial Planning and Sustainable Development (EPHSAA)**
A. Maximum distance from an existing land access road of any category	For installed power/unit below 10 MWe: 10-20 km, depending of the area
B. Maximum distance from the High Voltage electricity transmission system	As defined in the terms of connection of the installation (high voltage) and PPC S.A. (medium and low voltage)
C. Minimum distance between wind turbines	2,5 times the diameter of the turbine

B. Distances from areas of environmental interest	
Unconventional use	**Minimum distance based on the EPHSAA**
Areas of absolute protection of nature and nature conservation of Article 19 of Law 1650/1986.	According to article 21 of Law 1650/86) or the relevant Ministerial Decision (Law 3044/02)
- Core areas of National Parks, declared nature monuments, aesthetic forests not included in the areas of absolute nature protection and nature protection of Article 19 of Law No. 1650/1986. - RAMSAR wetlands - The priority habitats of areas of the country that have been included in the list of sites of Community importance of the NATURA 2000 network according to Commission Decision 2006/613/EC.	Decided on a case-by-case basis in the context of AEPO

Bathing beaches included in the bathing water quality monitoring programme coordinated by the Hellenic Ministry of Environment & Energy.	1500 m
Areas of avifauna	Decided on a case-by-case basis within the AEPO, after a specific ornithological study

C. Distances from cultural heritage sites and features	
Unconventional use	**Minimum distance based on the EPHSAA**
World Heritage List sites and other major monuments, archaeological sites and historic sites of Article 50 του Law 3028/2002	3.000 m
Absolute Protection Zone (Zone A) of other archaeological sites	A=7d=1.050 m, where (d) the diameter of the wind turbine blade at least 500 m
Declared cultural monuments and historical sites	A=7d=1.050 m, where (d) the diameter of the wind turbine blade at least 500 m

D. Distances from residential areas	
Unconventional use	**Minimum distance based on the EPHSAA**
Towns and settlements with a population of >2000 inhabitants or settlements with a population of <2000 inhabitants which are characterized as dynamic, touristic or remarkable according to Article 2 of 24.4/3.5.1985	1.000 m from the boundary of the settlement or town plan, as appropriate
Traditional settlements	1.500 m from the boundary of the settlement, in derogation from the above, it is possible by decision of the General Secretary of the Ministry of Environment &Energy following the recommendation of the competent Department,

	to reduce the above distance up to 1000 m if the number of dwellings that make up the settlement is < 20
Other settlement	500 m form the settlement boundary
Organized A' or B' residential development or B' residential areas, as identified in the framework of the MPE of each individual wind farm installation	1.000 m from the boundaries of the plan or landscaped area respectively
Monasteries	500 m from the monastery boundaries
Individual houses (legally existing)	Ensuring a minimum noise level of less than 45 db.

E. Distances from technical infrastructure networks and special uses	
Unconventional use	**Minimum distance based on the EPHSAA**
Main roads, roads under the responsibility of local authorities and railway lines	Safety distance 1.5d = 225 m from the boundaries of the expropriation zone of the road or railway network respectively.
High-voltage lines	Safety distance 1.5d = 225 m from the boundaries of the crossing limits of the lines
Telecommunication infrastructure, RADAR	On a case-by-case basis, an opinion from a competent body
Aviation installations or activities	On a case-by-case basis, an opinion from a competent body

F. Distances from zones or establishments of productive activities	
Unconventional use	**Minimum distance based on the EPHSAA**
High productivity agricultural land, afforestation zones, irrigated land	Safety distance 1.5d = 225 m
Fish farms	Safety distance 1.5d = 225 m
Units of livestock farming	Safety distance 1.5d= 225 m
Quarrying zones and activities	As defined in the legislation in force
Operating surface mining - extraction zones and activities	500 m
Integrated Tourism Development Areas and other Areas of Organized Development of Productive Activities of the tertiary sector, theme parks, tourist ports and other established or developed tourist areas (as identified in the MPE of the wind farm for each individual installation). Tourist accommodation and special tourist infrastructure	1000 m from the boundaries of the zone/area

Photovoltaics

According to the Special Spatial Planning and Sustainable Development Framework for Renewable Energy Sources, the exclusion zones for the site selection of solar energy installations are:

- Areas declared as World Heritage sites and monuments of major importance (UNESCO) as well as designated archaeological protection zones.
- Areas of absolute protection of nature and landscape, areas of national parks, declared nature monuments and areas with aesthetic forests.
- Protected areas included in the list of sites of community importance of the NATURA 2000 network, in forests and on highly productive agricultural land.
- Other areas or zones subject to a special land use regime, under which the siting of solar energy installations is not allowed (Special Framework for Spatial Planning and

Sustainable Development for RES, Ministry of Environment, Spatial Planning and Urban Development, 2008).

Hydrogen
There is no specific legislation regarding hydrogen in Greece yet. In European level, there is currently proposal COM/2021/803 final (Document 52021PC0803) for a European Directive that has not been approved yet.

6.1.3.3. MINISTERIAL DECISION 5295/09.10.2003 APPROVAL OF PREFECTURAL FRAMEWORK OF SPATIAL PLANNING AND SUSTAINABLE DEVELOPMENT FOR THE PREFECTURE OF WESTERN MACEDONIA

This Ministerial Decision refers to further expanding the share of RES in the energy balance by mobilizing private resources and strengthening the infrastructure and the reduction of the environmental impact of energy use, and meeting the country's environmental commitments, including on fuel quality.

6.1.4. ENERGY LAW AND OTHER

This section presents the relatively recent legislation regarding Just Transition in Greece and in particular the laws related to Delignification Zones, their Spatial Development Plans and their uses, Just Transition Development and the management of the Greek regions in transition.

6.1.4.1. LAW 4956/2022 RATIFICATION OF THE PROGRAMMING AGREEMENT OF PARAGRAPH 4 OF ARTICLE 5 OF LAW 4759 BETWEEN THE GREEK STATE AND THE ANONYMOUS COMPANIES WITH THE TITLE “METAVASI S.A” AND “PPC S.A.”

This Law refers to the full transfer from PPC S.A. to METAVASIS S.A. of all rights, activities and assets on the areas of the Delignification Zones in Ptolemaida, Amynteo and Megalopolis regions, where the need for their reclamation and utilization and the improvement of the land is apparent. The funding will be provided by the Recovery and Stability Fund, to which Greece is a beneficiary. PPC S.A. will continue to produce lignite and electricity within the Delignification Zones to meet the country's energy needs for as long as permitted by law.

The rehabilitation works are implemented by PPC S.A. in the areas affected by mining, supervised by PPC S.A. and METAVASI S.A. and defined in the AEPOs (which were issued at the end of 2022). PPC S.A. may carry out public tenders for the implementation of the rehabilitation works by contractors under its supervision. The rehabilitated areas will be received by METAVASI S.A. in sections or as a whole and are expected to be completed by 2025.

6.1.4.2. LAW 4872/2021 JUST TRANSITION DEVELOPMENT, REGULATION FOR SPECIAL LIGNITE TRANSITION ISSUES AND OTHER URGENT PROVISIONS

Within the Law 4872/2021 Just Transition Development, regulation for special lignite transition issues and other urgent provisions it's worth noting two articles in particular:

All lands owned by PPC S.A. and were acquired for the purpose of mining and exploitation of a lignite deposits which are included in the Delignification Zones of Article 155 of Law No. 4759/2020, shall be deemed to have fulfilled the purpose for which they were acquired and may now be used for other purposes in the context of the delignification process.

The areas included in the center of the Delignification Zones are subject to a remediation obligation under the AEPO in force at the time. These lands may be used for other purposes of public interest either by being transferred in accordance with the provisions of this law or

remaining for use and exploitation by PPC S.A., for activities related to the production and storage of electricity and in particular:

a) The production of electricity through renewable energy sources,
b) the storage of electricity,
c) green hydrogen, biomass and waste-to-energy facilities.

The number of letters of guarantee for the rehabilitation of lignite mines is recalculated on the basis of the shortening of the life of the mines and the reduction of the affected surface area of the mines, as well as the subsequent changes in the mining and rehabilitation operations. To this end, operators are invited to submit an amendment to the AEPO, in which the costs of remediation are specified for the remaining time of operation of the project, within which they must complete the remediation in relation to the new area of intervention.

Until the approval of the amendment file of the AEPO, the operators may carry out all the operations concerning the area covered by the amendment submitted for approval. Pending the approval of the amendment file of the AEPO, any authorizations from the competent authorities involved, such as forestry and the Ministry of Environment and Energy, shall be granted within the framework of the existing AEPO approved under amendment, in order to ensure the uninterrupted continuation of operations in the lignite mines.

The common areas, areas of public use and any lands that are assigned to the Municipality or the Greek State will be deemed to be transferred to common use. These areas will remain under the administration, management and operation of the implementing body of the Spatial Development Plan, until their configuration and delivery by the body to the municipality concerned or to the Greek State. This handover may take place in stages.

6.1.4.3. LAW 4759/2020 MODERNIZATION OF SPATIAL AND URBAN PLANNING LEGISLATION AND OTHER PROVISIONS

The Law 4759/2020 (FEK 245/A` 9.12.2020) elaborates on the modernization of spatial and urban planning legislation and other provisions includes provisions related to Delignification Zones and Spatial Development Plans. It covers several important aspects, including the responsibility for conducting technical studies and implementing rehabilitation measures, as well as issues related to RES and reforestation.

Responsibility of conducting technical studies and implementing rehabilitation measures
A contract between the Ministry of the Environment and Energy and the Public Power Corporation (PPC S.A.) may assign to PPC S.A. the execution of tenders for the preparation of the studies of the Spatial Development Plans within the Delignification Zones at the company's expense and to determine the specific terms of cooperation, including the responsibilities of the Special Advisory Committees in the preparation, award and execution of the study contracts.

Also, the contract, which is ratified by the Parliament, may assign to PPC S.A. the implementation of new land uses and the upgrading of areas that were owned or used by PPC S.A. for the production of electricity from lignite and are included in the Delignification Zones.

The contract provides for the terms and conditions for the upgrading of the land by PPC S.A. as described above, the obligations, the monitoring of the execution of the contract, the method of covering the costs of the actions and the relevant financial instruments, the method of calculating the management costs of PPC S.A. and their coverage, as well as the method of transferring to the State the ownership of the reclaimed land owned by PPC S.A.

RES

Licenses or approvals provided during the licensing of Renewable Energy Sources (RES) projects that are installed within the Centers of the Delignification Zones, such as the approval of environmental terms and the installation and operation licenses, are processed with absolute priority by the licensing authorities, as well as all the services and bodies that advise during the licensing process.

In forests and wooded areas within the depleted or under exploitation lignite mines of PPC S.A., intervention for the installation of photovoltaic power plants is permitted, after approval by the Directorate of Forestry Works and Infrastructure of the Ministry of Environment and Energy, following a recommendation of the locally competent forestry service, if the reforestation of these areas is not feasible.

Reforestation
The contract between the Minister of the Environment and Energy and PPC S.A provides for the obligation to create new forests as a priority within the areas of depleted or operational mines, as well as the relevant specifications and any necessary issue for the implementation of afforestation. All relevant plantations shall be completed within three (3) years from the entry into force of this Act.

6.1.4.4. MINISTERIAL DECISION 3791/2013 STANDARD ENVIRONMENTAL COMMITMENTS FOR RENEWABLE ENERGY RESOURCES WORKS AND ACTIVITIES CLASSIFIED IN CATEGORY B OF THE 10TH GROUP "RENEWABLE ENERGY RESOURCES".

The purpose of this Ministerial Decision is to establish environmental conditions and restrictions during the construction and operation phase of category B of group 10 (RES projects). It refers to small-scale wind, photovoltaic and hydroelectric projects and defines the environmental conditions concerning their construction, operation, decommissioning and waste management.

6.2. SHORT CHARACTERIZATION OF THE MOST IMPORTANT ASPECTS INCLUDED IN THE DOCUMENTS FROM THE PROSPECTIVE OF AN END USER

6.2.1. REHABILITATION LEGISLATION

As mentioned before, the environmental licensing legislation is the basis for all mining, rehabilitation/reclamation works and implementation of future land uses in post mining areas, with AEPOs and MPE studies being the main instruments. The Mining Code is also instrumental in terms of mine rehabilitation.

For mining projects in general, the operator in obliged by the legislation to plan, implement, supervise and fund all reclamation works carried out during and after operation. The same applies to the Delignification Zones in Greece, such as Western Macedonia, where PPC S.A. is the operator. The reclaimed lands will then be transferred to the State, and the in the case of Western Macedonia they will be transferred to METAVASI S.A., a public company that will then manage their uses (unless they remain to PPC S.A. for future use). All these processes are documented in the relevant recent laws on transition and delignification (see annex table 5).

6.2.2. RES

The main milestones and licenses for a wind energy project in Greece, issued sequentially, are:

a) The **Production License**, which in practice constitutes "a project feasibility approval".
b) The **Approval of Environmental Terms** or otherwise **Environmental Impact Assessment (MPE) Approval**.

c) The **binding Grid Connection Offer** (GCO), which is issued after MPE Approval and secures access to the electrical grid. It specifies the point of the grid where the wind power plant will be connected, the required works for this purpose and their costs.
d) The **Installation License**. The competent authority is bound to issue the Installation License, as far as a binding Grid Connection Offer has been obtained and various formal prerequisites -all being subject of proper preparation and of the discretion of the investor to execute them (payment of taxes, fees, land-use right etc.)- have been met. The Installation License grants the right to proceed with the construction of the project.
e) The **Operation License** is the final License of a wind energy project and is issued after the construction and successful startup of the power plant.

It is noted that once a binding GCO has been obtained and before the issuance of the Installation License, a request towards signing the Grid Connection Contract (GCC) with the System Operator is submitted. After signing the GCC, the Power Purchase Agreement (PPA) is signed with the Electricity Market Operator (EMO, LAGIE in Greek) for injecting the produced electricity to the grid in a predefined feed-in tariff. It is noted that the enforcement of GCC and PPA takes place only after the issuance of Installation License (see annex table 6).

7. COMPARISON ON NATIONAL LAWS

Legal regulations governing the reclamation and development of post-mining areas and renewable energy installations vary across Germany, Poland, and Greece, with the common framework of EU directives. However, the process of transposing these directives into national law differs across the three countries. Germany and Greece incorporated EU directives earlier than Poland due to historical reasons. Moreover, administrative divisions within each country can influence the legal regulations on reclamation of post-mining areas, leading to differences between regions or states.

Despite these variations, each country has comparable laws and executive regulations to ensure the proper reclamation and management of post-mining areas and renewable energy installations. These include i.e. regulations in the field of geological and mining law or environmental impact assessment. Nevertheless, each country's approach to implementing these laws can differ, leading to differences in the specific requirements and procedures that must be followed.

Overall, while there are some similarities and shared frameworks, the legal regulations governing reclamation and renewable energy installations in Germany, Poland, and Greece are shaped by a combination of historical, political, and administrative factors, resulting in differences between these countries.

Selected similarities and differences in German, Polish and Greek legislation are presented below.

7.1. RECLAMATION

Similarities:

1) All three countries have established legal frameworks for the reclamation and management of post-mining areas and the development of renewable energy installations. These frameworks include EU directives, national laws, and executive regulations.

2) Regarding the responsible party for reclamation, in Germany, Greece and Poland, the polluter-pays principle is applied, as well as the responsible parties are required to cover the costs of reclamation.

3) Each country has a controlling body for land reclamationand rehabilitation. For instance, Germany has a responsible mining authority as a mining supervisor body, and Poland has a wider group of inspectors, including the Minister of Agriculture and Food Economy, the Minister of Environmental Protection, Natural Resources, and Forestry, marshals of voivodships, the staroste, the director of the regional directorate of State Forests, the director of the national the commune head, the voivodship sanitary inspector as well as mining supervision authorities. Greece has also the Minister of Environment and Energy with the laws implemented by all administrative structure.

4) Each country allows for mining waste storage in mining excavations.

5) Local development plans are taken into account in the reclamation and development of post-mining.

6) In each of the countries, a significant role in the reclamation of post-mining areas is played by environmental impact assessment.

Differences:

1) In terms of the time for land reclamation, Germany requires a mandatory mine closure plan to determine the reclamation extent and approximate duration. Poland requires that land reclamation be carried out as the land becomes redundant for the operation of the mining plant and completed within 5 years of the cessation of industrial activities. In Greece, rehabilitation measures should be implemented as early as possible in the mining operation to ensure completion on time.

2) Different administrative divisions within a country can led to variations in the management and control schemes for the reclamation process.

Overall, the legal regulations in Germany, Greece, and Poland aim to ensure that the rehabilitation of post mining areas is carried out in a manner that is consistent with environmental protection, spatial planning, and sustainable development principles. Each country has its own approach and criteria, but all share the goal of promoting sustainable development, protecting the environment, and minimizing the negative impact of mining activities on the surrounding areas.

7.2. RES

Similarities:

1) RES installation must be reflected in the spatial development plan. This requirement ensures that the installation is located in an appropriate area and is consistent with the overall land use plan.

2) Mandatory environmental impact assessment for all renewable energy projects. The EIA examines issues such as the presence of protected areas, the impact of noise or location of birds and bats corridors. This assessment helps to identify any potential negative environmental impacts and identifies measures to mitigate or reduce these impacts. These requirements reflect the importance of environmental protection in the development of renewable energy projects.

3) The greatest restrictions apply to wind installations, when no specific legal regulations are introduced for photovoltaic ones.

Differences:

1) German law includes specific provisions for hydrogen installations, while Polish and Greek law currently do not. In Poland, hydrogen installations are regulated by the construction law. However, given the increasing importance of hydrogen in the context of renewable energy and decarbonization, it is likely that new regulations will be introduced in the future to address the safe and effective deployment of hydrogen technologies. Also in Greece, there is no specific legislation regarding hydrogen yet.

2) The regulations on the minimum distance between RES installations and residential areas, protected areas, or public roads. These differences reflect the different approaches taken by each country to ensure the safe and effective deployment of renewable energy technologies. For example, in Germany, restrictions for wind farms depend on state law, the minimum distance is 2000m, while in North Rhine-Westphalia, it is 1000m, and in Hamburg, it is 400m. In Poland, new regulations introduced in 2023 require a distance of not less than 700m. In Greece, the distance must be 1000m from the boundary of the settlement or 1500m from the boundary of the traditional settlement.

In order to better illustrate the aspects of legal regulations related to reclamation and RES installations, a summary table with selected issues has been presented below.

Table 2. Comparison table for legislation on **reclamation** of post-mining areas

MAIN CATEGORIES	GERMANY	POLAND	GREECE
Geotechnical conditions of the site		Ground investigation report, geotechnical design report and geological-engineering documentation must be delivered in addition to construction design and geotechnical opinion	The location and method of disposal, as well as the final structure of the mining waste deposits, must be chosen during the preparation of the technical study (before operation), in order to ensure the rational operation of the project, the stability of the slopes (with compaction of the material, where necessary) or dams, where appropriate, and the possibility of restoring the landscape. There is no technical study after the closure of the mine, only for the plantations.
Reclamation responsible party	Appointed in mandatory mine closure plan - especially §53 (2) BBergG in agreement with §58 BBergG. In general, the polluter-pays principle (mining company) is applied, yet single processes within the reclamation can be outsourced.	The party causing the loss or reduction of the use value of the land shall be obliged to rehabilitate the land at its own expense. If the industrial activity causing the obligation to rehabilitate the land is carried out by several parties, the obligation is incumbent on each of them, according to the extent of the activity causing the need for rehabilitation.	Mine operator for mines in general, in the case of the Delignification Zones in Greece, PPC S.A. is the responsible party.
Time for land reclamation	Appointed in mandatory mine closure plan - especially §53 (1) BBergG. Scoping is necessary to determine the reclamation extent and its approximate duration.	In the case of all mining plants, land reclamation should be carried out as the land becomes redundant for the operation of the mining plant and shall be completed within 5 years of the cessation of industrial activities.	Rehabilitation measure are to be implemented as early in the mining operation as possible in order for the rehabilitation processes to be completed on time.
Controlling the implementation of land reclamation	Appointed in mandatory mine closure plan - especially §69 BBergG. The responsible mining authority operates as mining supervisor. Depending on the state the allocation of the mining authority may vary. In the state of North-Rhine Westphalia the lower mining authority is situated at the district government.	The application of legal provisions related to reclamation can be supervised by multiple entities, including the Minister of Agriculture and Food Economy, the Minister of Environmental Protection, Natural Resources, and Forestry, marshals of voivodships, the staroste, the director of the regional directorate of State Forests, the director of the national the commune head, the voivodship sanitary inspector as well as mining supervision authorities. Minimum yearly control of compliance with documentation.	Same as “Reclamation responsible party”
Mine waste management	Obligation and scope appointed in mandatory mine closure plan. The mining company hast to develop a waste management plan containing the type and quantity of waste and its potential impact on protected goods, as well as according safety measures.	As part of the mining waste management process, the mining waste holder is responsible for creating a comprehensive plan that outlines the strategy for closing the mining waste disposal facility. This plan should include a detailed description of the approach for land reclamation, post-closure procedures, and the monitoring strategy.It is mandatory for a mining waste facility to carry out monitoring activities both during and after its operation.	The location and method of disposal and the final configuration of the tailings disposal facilities must be chosen in the preparation of the technical study.When the operator reintroduces extractive waste into excavation voids that is produced from either surface or underground mining for rehabilitation and construction purposes, the operator shall take appropriate measures.
Principles for the	These principles are constituted in attachment 6 and 7	The waste holder must:	The operator is obliged to apply Best Available Techniques

MAIN CATEGORIES	GERMANY	POLAND	GREECE
operation of a mine waste facility	of the General Federal Mining Ordinance (ABBergV) and contain information such as the location, company name or comprehensiveness of security measues. Also financial measures are included to guarantee a future decommisioning of mine waste facilities.	• operate facility in a way that prevents soil and water deterioration caused by seepage water, including determining the facility's water balance. They must also prevent these effects after the facility is closed; • prevent the emission of dust and gases from the facility. • ensure the stability and chemical stability of the facility, including ongoing control of the facility's stability; • if the facility stores waste containing combustible parts, the waste holder must implement technical measures to prevent fires.	(BAT) during the exploration, extraction and disposal of waste (mining and non-mining). After the closure of a waste facility, the operator shall without delay send information to the competent authority, as appropriate, on any event or development likely to affect the stability of the waste facility and on any serious adverse effects on the environment identified during the control and monitoring procedures. Where and at the frequency specified in the AEPO, the operator shall report to the competent authority the results of the monitoring, based on aggregated data, in order to demonstrate compliance with the conditions of the environmental permit and to improve knowledge of the behaviour of the waste and the waste facility.
Criteria that should be met by projects for the reclamation of areas after the mining operations	The federal mining act defines “reclamation” as a proper layout of the claimed surface with regard to the public interest and to extent required by circumstances. An assignment of land is only legal if the responsible party has taken care of the reclamation to an extent, where the surface has gained an increase of value due to reclamation measurements. Further criteria on reclamation and the target of achieving a “natural condition” can be found in the Federal Nature Conservation Act (BNatSchG). If local measurements don’t fit the criteria, compensation (money) and replacement measures elsewhere can serve as a substitute (state law).	In accordance with the law, reclamation refers to the process of restoring or enhancing the utility and natural values of degraded or devastated land by reshaping the landform, improving physical and chemical properties, regulating water relations, restoring soils, reinforcing slopes, and constructing necessary roads. A decision on reclamation completion confirms the successful completion of this process. The assessment of whether reclamation has been completed should not be based on the scope of the work performed but on whether the land's utility values have been restored through appropriate treatments.	The criteria and requirements/specification used in all aspects of reclamation must be stated in the MPE studies for mining projects and activities. An approved MPE leads to obtainment of a AEPO, which is obligatory for any new project of activity in Greece, with environmental impact. For projects located in Natura 2000 sites, Special Ecological Assessment studies are also prepared.MPE studies state in detail all remedial or preventive measures and actions to monitor environmental media and parameters to avoid or minimise impacts or to remedy or restore the environment. As stated in AEPO and the MPE studies, the operator in obliged and responsible to plan, implement, supervise and fund all reclamation works carried out during and after operation. For the Delignification Zones in Greece, PPC S.A. is the operator, with METAVASI S.A. co-supervising the reclamation projects.
Environmental impact	An environmental impact assessment is not indispensable, as it depends on the future land use of the former mining area, whether its needed or not.	The environmental impact assessment procedure plays a crucial role in the planning process and serves as a vital tool for achieving sustainable development. To	

MAIN CATEGORIES	GERMANY	POLAND	GREECE
assessments	Subjects to an assessment can be found in attachment 1 of the Federal Environmental Impact Assessment Act. If the mining activity needs an environmental impact assessment in the case of a planning approval procedure, it is posted within the mine operating plan.	ensure that reclamation efforts align with this principle, all reclamation projects are subject to strategic environmental impact assessments during the spatial planning stage, before undertaking specific reclamation activities.	
Principles of reclamation	The relevant conservation goals within the Federal Nature Conservation Act derive from EU-Directive 92/43/EEC, the “Habitats Directive”, as well as EU-Directive 2009/147/EC, the “Birds Directive”. Protected areas following these directives qualify the Naura-2000 Network. At least 10% of each Federal state is supposed to consist as biotope network. Reclaimed land can be part of this, however there is a catalogue of various land use types adding to the network (§20 (2) BNatSchG).	There are lot of regulations with principles govern various aspects of the reclamation process, including the procedures for conducting the work, land management after reclamation, and the monitoring of reclamation effects. I.e.:Act of 9 June 2011 Geological and Mining Law Act of agricultural and forested land protection of February 3, 1995; Regulation of 8 December, 2017 of the Minister of the Environment on mining plant operation plans; regulations on the operation of mining plants.	
Nature conservation	Protecting nature or landscape is done via declaration as an act and in regard to EU-Directive 2001/41/EC, which regulates environmental assessment procedure. Therefore, an environmental impact assessment would be mandatory.	Reclamation of post-mining areas should be carried out in accordance with the principles of nature protection. Environmental impact assessment is necessary for selected activities specified in Regulation on projects that may have a significant impact on the environment. As part of this assessment, the need to include Natura 2000 areas should also be highlighted. The executive authority of the commune, such as the commune head, mayor, or city president, is typically responsible for conducting environmental impact assessments. In some cases, other authorities such as the General Director for Environmental Protection or the director of the regional directorate of the State Forests may also be involved.	

MAIN CATEGORIES	GERMANY	POLAND	GREECE
Consent to carry out reclamation work	Appointed in mandatory mine closure plan - especially §53 (1) BBergG. The responsible mining authority operates as mining supervisor and approves the reclamation work to be carried out.	Companies engaged in mining activities must obtain permission to conduct mining and reclamation work. The basic document regulating the reclamation process is the reclamation and development decision. Such a decision is issued by the staroste, after obtaining the opinion of: the director of the relevant regional mining office - in relation to mining activities, the director of the regional directorate of the State Forests or the director of the national park - in relation to land with a planned forest reclamation direction and the commune head (mayor, president of the city).	As stated in AEPO and the MPE studies, the operator in obliged and responsible to plan, implement, supervise and fund all reclamation works carried out during and after operation. For the Delignification Zones in Greece, PPC S.A. is the operator, with METAVASI S.A. co-supervising the reclamation projects.
Reclamation obligation	Polluter-pays principle: Mining companies are obliged to carry out reclamation work in areas where their mining activities have been carried out.Prevention principle: Prevention is preferred to compensation and reclamation. Corresponding efforts should be highlighted in operating, waste management and closing plans.	Mining companies are obliged to recultivate all areas transformed as a result of mining activities, which caused the loss of their value in use.	
Preparation of reclamation plans		There are several ways to document remediation: - Land reclamation in mining plants must follow the guidelines outlined in the approved **reclamation documentation**, which specifies the direction, scope, method, and date of reclamation. - The **mining plant operation pla**n includes a plan that emphasizes environmental protection and the reclamation of land after mining activities. - In the event of a mining plant's liquidation, the recultivation procedure is outlined in the **operation plan of the liquidated plant**. Additionally, an administrative decision issued by the staroste is required.	

MAIN CATEGORIES	GERMANY	POLAND	GREECE
Reclamation of post-mining areas must be in accordance with the arrangements of land use plans and other applicable legal acts	Spatial planning objectives must be taken into consideration by the mining authority, when approving operational and closing plans. If more than 300 persons are affected by the plans o r the affected are not conclusive, the plan needs to be displayed to the public. This involves a consultation and consideration process	While there is no specific provision requiring consideration of the local plan's provisions for land development after exploitation, the staroste consults with the commune head (mayor or president of the city) when issuing a reclamation decision. The commune head should take into account the arrangements resulting from the local spatial development plan or study.	
Obligation to obtain a decision on the conditions of development and land use	Land needs to be relinquished from mining supervision. Afterwards the land use usually devolves from “mining” to an “industrial” notation and will be treated as such, until the planning body and politics transpose the land use in a legal manner. For further development additional ownership issues have to solved.	Mining activities must align with the real estate's designated purpose in the local spatial development plan or study of conditions and directions of spatial development of the commune. Mining regions and areas must also be included in these documents. The study and local plans promote environmental resource management and natural balance through rational land use and management programs, including areas where mineral deposits are exploited. Additionally, the plans specify methods for developing degraded areas resulting from human activity.	To change the land use of a reclaimed mining site, a new AEPO must be obtained by the operator for the new land use (whether is the mining operator or a different operator), by preparing a new MPE. For the Delignification Zones in Greece, PPC S.A. or any other operator must obtain new AEPOs for new projects. Reclaimed lands that will not be further utilised by PPC S.A., are transferred to METAVASI S.A. and the Greek State and will remain under the administration, management and operation of the implementing body of the Spatial Development Plan, until their configuration and delivery by the body to the municipality concerned or to the Greek State. This handover may take place in stages.
Study of conditions and directions of spatial development	There are various instruments and procedures in German planning law to gain insight on this, but nothing mandatory.	The study provides the basis for decisions on the formation of space in a given area, including post-mining areas. The study determines, among other things, the objectives and principles of land development, and also takes into account the requirements of environmental protection and prevention of damage to the environment	

Table 3. Comparison table for legislation on **RES installations**

MAIN CATEGORIES	GERMANY			POLAND			GREECE		
	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN
ENERGY POTENTIAL RELATED TO METEOROLOGICAL/ TOPOGRAPHIC CONDITIONS	Federal extension targets, e.g. ● Wind (onshore): 2030 115 GW | 2040 160 GW ● Wind (onshore): between 0,5% and 2,2% of every Federal state area until 2032 (depending on the Federal state) ● Wind (offshore): 2030 30 GW | 2045 70 GW ● Solar: 2030 215 GW | 2040 400 GW Investor must investigate the energy resource to calculate the resulting power output and prove profitability of an investment. However, public authorities must consider wind potentials in their planning approaches and approval planning as they must commit to an expedient urban development. In the state of NRW there is a GIS-system operated by the Federal State environmental agency (LANUV) for measuring renewable energy potentials: ● https://www.energieatlas.nrw.de/site/planungskarten/wind ● https://www.energieatlas.nrw.de/site/karte_solarkataster			Energy resource must be investigated in order to calculate the resulting power output and prove profitability of an investment			Preparation of an energy study to document electricity generation potential and documentation of RES potential		

MAIN CATEGORIES	GERMANY			POLAND			GREECE		
	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN
RIGHTS TO USE THE LAND	Land needs to be relinquished from mining supervision. Afterwards the land use usually devolves from “mining” to an “industrial” notation and will be treated as such. Consisting spatial law obligated to use the land as an owner towards erecting renewable energy: ● Regions are obliged to locate priority areas for wind energy in their regional plans at least until 02.2024 (f.ex. ~2000 ha at Ruhr Area) ● Federal building code is fundamental right of approval for wind and solar energy. ● State law (state building code) substantiates federal law as right of approval. ● The German Renewable Energy Sources Act (EEG) regulates on national level all subsidized renewable energy ● projects and its approval.			The location of a wind or photovoltaic power plant is based only on the local plan Depending on the design of the installation: - a building permanently attached to the ground - a building and occupancy permit is required; - structures not permanently attached to the ground - no need for a building permit.	Devices with an installed capacity of more than 50 kW always require a building permit		Since 2011, Environmental Impact Assessment (MPE) approval provides also the land-use right if the installation site is a public forestal area (permission for intervention). Furthermore, expropriation rights are obtained in case of private land as part of the MPE approval.		
GEOTECHNICAL CONDITIONS OF THE SITE	Hard coal waste dumps were not meant for building installations. Requirements for structural stability and other specifications/ standards follow certain DIN standards and are required for the approval planning by the responsible authority. Requirements of soil protection and the contaminated sites			Ground investigation report, geotechnical design report and geological-engineering documentation must be delivered in addition to construction design and geotechnical opinion			Prior to the construction of the project, field investigation work is required as part of the geotechnical study programme.		

MAIN CATEGORIES		GERMANY			POLAND			GREECE		
		WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN
		ordinance have to be taken into account when approving a project.								
GRID LIMITATIONS	GRID CONNECTION CONDITIONS	Must be agreed with regional power grid operator. If the grid is not capable of including the power source, the regional power grid operator is obliged to expand the grid accordingly. A grid compatibility test is usually done by the grid operator beforehand. Technical specification can be found in norms of relevant technical institutes such as VDE (Association of Electrical, Electronic & Information Technologies).		The construction of a hydrogen grid is of outstanding public interest until the 31st December 2025 (at least). Therefore, setting up a national grid is prioritised at the moment. In most other cases the hydrogen grid is handled as other gas supply lines. Usually, the route planning demands a formalised planning approval procedure.	Must be agreed with regional power grid operator			A non-binding, provisional, Grid Connection Offer (GCO) is issued by the System Operator, immediately after the issuance of the Production License. The binding GCO, is issued by System Operator after MPE Approval.		

MAIN CATEGORIES		GERMANY			POLAND			GREECE		
		WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN
	DISTANCE TO THE NEAREST ELECTRIC SUBSTATION	Regional power grid operator determines location of the grid connection, but is obliged to find the economically favourable spot – for both plant and grid operators. Depending on the scale of the project the erection of a substation is necessary.			When selecting the land for the investment, the distance from medium-voltage power lines and main power point (GPZ) should be taken into account.			As defined in the terms of connection of the installation (high voltage) and PPC S.A. (medium and low voltage)		
POSSIBILITY OF HEAVY MATERIAL TRANSPORTATION TO THE SITE		Usually possible, as bulk procedure of larger scale hard coal waste demands suitable roads.			Usually possible; various roads available in the vicinity of the former mine			It is being considered for environmental licensing		
SPATIAL LIMITATIONS	ESTABLISHED LOCAL LAND USE PLAN	Can be approved outside a legally binding land use plan if it's outside of settlements and there are no opposed interests, as they are "privileged structural installations". Opposing interests are mainly harmful environmental effects (§35 (3) No. 3 BauGB)	Can be approved outside a legally binding land use plan if it's outside of settlements and connected to suitable buildings or if it's connected to linear infrastructure such as highways. Temporal planning and approval are possible as dismantling of PV installations is	n/a	The plan must indicate possibility for wind power plant construction	The plan must indicate possibility for solar plant construction; if there is no local land use plan established, a zoning and land use decision for a plot of land in question must be obtained		The plan must indicate possibility for wind power plant construction	The plan must indicate possibility for solar plant construction; Other areas or zones subject to a special land use regime, under which the siting of solar energy installations is not allowed	

MAIN CATEGORIES		GERMANY			POLAND			GREECE		
		WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN
			relatively easy.							
	DISTANCE TO RESIDENTIAL/NATURE PROTECTION AREAS	Minimum distance depends on state law, f. ex. - Bavaria 2000m - North Rhine-Westphalia 1000m - Hamburg 400m And guidelines of relevant technical institutes such as FA Wind (Specialised agency Wind Energy on Land). Recommendation of FA Wind is Distance = 10x Turbine Height (Hub Height + Rotor)	n/a	n/a	Distance to residential - at least 700 m Distance to nature protection areas - not less than ten times the height of the wind farm	No fixed standards regarding the minimum distance		The distance must be 1.000 m from the boundary of the settlement or 1.500 m from the boundary of the traditional settlement	No fixed standards regarding the minimum distance	
	INVESTMENT ON RURAL LAND	Agricultural-PV (Agri PV) allows agricultural production whilst producing solar energy. Wind energy plants can be approved on agricultural land without mayor changes on the prevailing land use, yet it impacts the land value calculations.			If the land was reclaimed for agricultural purposes, it has to be excluded from agricultural use (regardless of the class of agricultural land)			Post-mining land uses have not been defined yet in the Delignification Zones		

MAIN CATEGORIES		GERMANY			POLAND			GREECE		
		WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN
	DISTANCE TO PUBLIC ROADS	Distances are varying as there is federal and state law on this topic. Federal law restricts or forbids high buildings in a distance of • 40m – 100m Controlled access Highway • 20m – 40m Federal Highway • 20m – 40m State Road • 15m – 40m County Road			Minimum distances are specified in the Act on public roads depending on the type of road and whether the investment is planned in built-up or undeveloped areas. If smaller, a consent of a relevant road administrator must be obtained. Minimum distances for: • Highway: 30-50 m • Expressway: 20-40 m • Public road: - national: 10-25 m - voivodship, poviat: 8-20 m - commune: 6-15 m			Safety distance 1.5d = 225 m from the boundaries of the expropriation zone of the road or railway network respectively, where (d) the diameter of the wind turbine blade at least 500 m.	No fixed standards regarding the minimum distance	
	DISTANCE TO POWER TRANSMISSION LINES	Power transmission lines have protective strips varying in size depending on the voltage and size. Wind energy plants are not allowed to protrude in the protective strips. DIN standards regulating distances were superimposed by more current enactments, such as the wind-energy	General safety distance of high voltage power transmission lines for buildings must be obeyed. Individual cases may apply. • 100 kV – 3m - 11m • 380 kV – 5m - 13m		Minimum distances are specified by power distribution companies and depend on voltage of the power lines	Location of a power plant in a close distance to a power line, especially within a technical lane going along the line, must be agreed with a relevant power distribution company		Safety distance 1.5d = 225 m from the boundaries of the crossing limits of the lines, where (d) the diameter of the wind turbine blade at least 500 m.	No fixed standards regarding the minimum distance	

MAIN CATEGORIES		GERMANY			POLAND			GREECE		
		WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN
		decree of North-Rhine Westphalia.								
	LOCATION OF AIR TRAFFIC	Air traffic has to be considered when constructing certain buildings within a perimeter of 1,5 km of an airstrip. The federal institution for air traffic control submits a statement within the approval process.			Areas with limited development of constructed objects due to air traffic must be checked in the local land use plan	n/a		On a case-by-case basis, an opinion from a competent body	n/a	
	LOCATION OF PROTECTED LANDSCAPE	Nature reserves exclude construction projects that impact preservation, development, or recovery of various protected goods, yet exceptions are possible. Landscape conservation areas allow wind energy plants as long as they are within a planned area according to § 2 Wind Energy Area Requirement Act (WindBG), so called Go-To-Areas, contributing to the federal renewable energy targets.			Priority landscapes may be indicted in local land use plans. Restrictions on spatial development set for landscape protection zones (that are designated in landscape parks and protected landscape areas) are binding for local land use plans/zoning and land use decisions					
ENVIRONMENTAL CONDITIONS/EIA	OBTAINING DECISION ON ENVIRONMENTAL CONDITIONS	An exclusion of harmful effects on environment is the main approval requirement by the Federal Immission Control Act (BImSchG), defining goods to be protected. Wind energy plants above 50m height are part of this right of approval. Smaller ones are subordinated to the individual states building regulations. The current EU emergency ordinance (2022/2577) causes			Required for wind power plants of a total height of more than 30 m or located within nature protection areas	Required for photovoltaic farms covering the area larger than 1 ha or 0.5 ha if located within a nature protection area		Depending on the nominal capacity of the projects and their location or not inside a protected area, there are 3 categories, with corresponding licensing authorities. See above in paragraph 8.1.2 for more details.		

MAIN CATEGORIES		GERMANY			POLAND			GREECE		
		WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN
		an omission of former environmental assessments. Nevertheless, local authorities have to check on available data to avoid planning errors.								
	LOCATION OF NATURE PROTECTION AREAS	Nature reserves exclude construction projects that impact preservation, development, or recovery of various protected goods, yet exceptions are possible.			Location of a power plant within some nature protection areas (such as national parks, nature reserves, landscape parks and Natura 2000 sites) is not possible. Location within other nature protection areas or its impact on the nearest nature protection areas is important in terms of EIA	Location of a power plant within a nature protection area or its impact on the nearest nature protection areas is important in terms of EIA		Location of a wind power plant within areas of environmental interest is decided on a case-by-case basis in the context of AEPO.	Location of a solar power plant within a nature protection area or its impact on the nearest nature protection areas is important in terms of MPE	
	ACOUSTIC INFLUENCE	§48 BImSchG initiate the creation of the German Noise Pollution Prevention Regulation (TA Lärm), which is responsible for assessing reasonableness of projects such as wind energy plants in regards of acoustic influence. TA Lärm substantiates the legal scale by linking acoustic limits to certain area categories and day times.			If a distance between a wind power plant and a residential area must be at least ten times a total height of the plant, the noise standards should	Noise analysis may need to be performed with regard to permissible noise levels during the day and night regarding a transformer station		The noise generated by the operation of wind turbines must be less than 50dB at the boundaries of their plot and less than 45dB at the boundaries of neighbouring	n/a	

MAIN CATEGORIES		GERMANY			POLAND			GREECE		
		WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN	WIND FARM	SOLAR FARM	HYDROGEN
					be met			settlements.		
					The Regulation of the Minister of the Environment in Poland sets permissible noise levels for different areas to protect the environment against noise pollution. The document specifies the acoustic noise levels for various areas based on their intended use, including residential areas, hospitals and nursing homes, areas for children and youth, spa areas, recreational areas, and residential and commercial areas.				
	LOCATION OF BIRDS AND BATS CORRIDORS	As a result of the implementation of the EU emergency ordinance wind energy plant located within a planned area according to §2 Wind Energy Area Requirement Act (WindBG) don't need a species conservation examination or an environmental impact assessment, as long as the designating regional plan or legally binding land-use plan did a strategic environmental assessment. Exceptions to this rule are Natura-2000-areas, like bird sanctuaries, national parks and other nature reserves with special protection status.			Monitoring of birds and bats, usually one year-long, is required for an environmental impact assessment report			If the project's area belongs to a protected area of Natura 2000 Network, the MPE must include a Special Ecological Evaluation study, as determined in Law 4014/2011.		

8. PROPOSED AMENDMENTS TO LEGAL REGULATIONS

Below are some potential changes to reclamation and renewable energy regulations in Germany, Poland, and Greece.

Germany:

- The development of raw materials usually goes hand in hand with risks for people, soil, water, flora, fauna, and other protected goods. For this reason, German mining law is very concerned to regulate the question of responsibility conclusively. This is basically a tried and tested procedure. As a consequence, however, state aid law is only applied in an apparent destructive manner. Accordingly, some reclamation measures can be funded, however, most of the time targeted post-mining land uses cannot be included in the mandatory reclamation. For this reason, some measures, such as soil remediation, have to be carried out more than once - by the responsible mining company and a future developer. By setting up affiliated companies, the mining companies often take care of further development themselves after they have been released from mining supervision. This system works and, moreover, spreads financial risks. Nevertheless, aid law at EU and federal level could be examined to prevent duplication of effort in the reclamation process.
- Recent legislation and policy implementation to accelerate the expansion of renewable energy is just getting underway. The impact remains to be observed. Bottleneck is the tension between environmental concerns and the acceleration of the process. The balance remains a political question among others.

Poland:

- The current regulations on the reclamation of post-mining areas are complex and lack clear guidelines for the responsibilities of monitoring. To address this issue, it is proposed that a more orderly law be introduced with unambiguous guidelines;
- In some cases, it may be challenging to complete reclamation within the mandated five-year period, such as in instances of large post-mining excavations that are susceptible to flooding. In light of this, it is recommended that the progress of reclamation works should be monitored according to the established plan without imposing a maximum time frame for implementation;
- The current regulations do not explicitly outline the obligation to consider the content of local spatial development plans when determining the directions of reclamation or issuing decisions on reclamation. Therefore, it is necessary to develop supplements to the existing legal framework. Adopting the German model of creating new regulations in the form of acts of local law, Governor's orders, standardization studies, or technical specifications may prove advantageous;
- Lastly, recent changes in the law related to wind farms have introduced a regulation requiring them to be built at a distance of not less than 700 m. However, according to many experts, this regulation may hinder the development of wind investments

Greece:

- Current legislation is very complex and laws are overlapping, preventing future investments due to the bureaucratic framework.
- The legal framework regarding the repurposing of land use in the delignification zones, should have been established prior to the planning of the transition. The current Master Plan provides some initial suggestions for land use repurposing, but the final land uses have not yet been established. Further actions are required to improve the legal framework regarding green hydrogen.

9. SUMMARY

The reclamation of post-mining areas is a crucial process that must be regulated by law. Reclamation law is important because it ensures that mining activities do not permanently damage the environment and leave behind unsafe, unusable land. It provides a framework for the restoration of land to a usable state, whether for agricultural, residential, or industrial purposes. Reclamation can also be an opportunity to use post-mining areas for renewable energy installations, especially given the current climate challenges. Without adequate reclamation regulations and enforcement, mining companies may prioritize profits over environmental sustainability and public health, leaving communities with contaminated land and polluted water sources. Reclamation law also ensures that mining companies are held responsible for the environmental damage caused by their operations, and provides a means for affected communities to seek redress and compensation for any harm caused. Overall, reclamation law plays a crucial role in balancing the economic benefits of mining with the need to protect the environment and public health.

The European Union has established legal frameworks to ensure that reclamation process is carried out properly. Although there is no specific reclamation law in the EU has created a number of regulations that relate indirectly to this subject. These regulations seek to ensure that mining activities are carried out in an environmentally responsible way and that the restoration of post-mining areas is carried out effectively.

The main EU regulations that relate to the reclamation process include among others: the Environmental Liability Directive, the Industrial Emissions Directive, Environmental Impact Assessment Directive or the Water Framework Directive. These regulations require that mining companies assess the environmental impact of their activities before they commence mining, and that they take steps to minimize any negative effects. They also require that mining companies provide financial guarantees to cover the cost of restoring the land after mining activities have ceased.

Since the European Union has established certain regulations related to environmental protection, spatial planning, and mining, these regulations influence the national laws of its member states. As a result, the legal frameworks for reclamation of post-mining areas in Germany, Poland, and Greece have many similarities. Each country has its own primary laws that regulate the reclamation process, which are then supplemented by additional acts in the fields of environmental protection or spatial planning. While there are similarities between these laws, such as the obligation to undertake reclamation measures and requirements for monitoring progress, there can be significant differences in the details of the laws and regulations. For example, in Poland, there is maximum time frame for completing reclamation works, whereas in Germany and Greece, the law does not regulate a specific time period. It is important to consider these differences when undertaking reclamation projects in different EU member states to ensure compliance with the relevant laws and regulations.

In matters of law related to renewable energy installations, similar dependencies exist. At the EU level, member states are linked by directives such as the Renewable Energy Directive or the Energy Efficiency Directive. Additionally, the member states are connected by the Emissions Trading System. However, specific regulations governing the installation of wind or photovoltaic power plants, such as distances from homes, protected areas or roads, are regulated at the national level.

In conclusion, while the EU and national regulations on reclamation and renewable energy projects in post-mining areas are well established, there is always room for improvement and simplification. It is crucial that more attention and resources are dedicated to these projects to ensure the achievement of climate goals and provide economic benefits and social welfare to the local communities.

10. CHECKLISTS FOR PARTICULAR COUNTRIES

In the Annex 1, comprehensive tables are demonstrated that outline the legal aspects related to the reclamation of post-mining areas and the installation of renewable energy systems in Germany, Poland, and Greece. These tables are designed to provide a clear and concise summary of the relevant legal acts and regulations related to each issue.

In particular, these tables offer valuable information for stakeholders involved in reclamation activities within coal regions in transition areas. By presenting the specific legal acts related to each issue, these tables provide a helpful roadmap for navigating the complex legal landscape of post-mining reclamation. In addition, the tables can serve as a helpful checklist for ensuring compliance with relevant regulations and requirements.

Annex 1.

Summary of the national legal frameworks regarding reclamation and RES installations.

Table 4. Summary of the **German** legal framework regarding **reclamation**

Main categories	Legal description	Legal basis
Geotechnical conditions of the site		• §53 (1) Federal Mining Act (BBergG) in force 08.1980, current version 06.2021
Reclamation responsible party	Appointed in mandatory mine closure plan - especially §53 (2) BBergG in agreement with §58 BBergG. In general, the polluter-pays principle (mining company) is applied, yet single processes within the reclamation can be outsourced.	• §§50 - 58; 62; 69 Federal Mining Act (BBergG) in force 08.1980, current version 06.2021 • §15 Federal Nature Conservation Act (BNatSchG), in force 12.1976, updated 03.2010, current version 12.2022
Time for land reclamation	Appointed in mandatory mine closure plan - especially §53 (1) BBergG. Scoping is necessary to determine the reclamation extent and its approximate duration.	
Controlling the implementation of land reclamation	Appointed in mandatory mine closure plan - especially §69 BBergG. The responsible mining authority operates as mining supervisor. Depending on the state the allocation of the mining authority may vary. In the state of North-Rhine Westphalia the lower mining authority is situated at the district government.	
Mine waste management	Obligation and scope appointed in mandatory mine closure plan. The mining company hast to develop a waste management plan containing the type and quantity of waste and its potential impact on protected goods, as well as according safety measures. Additionally, the waste management plan has to contain information on waste disposal facilities, that are used to treat accruing mine waste.	• §55 Federal Mining Act (BBergG) in force 08.1980, current version 06.2021 • §22a and Attachment 5 - 7 General Federal Mining Ordinance (ABBergV), in force 10.1995, current version 10.2017 • EU-Ordinance 2006/21/EG, in force 03.2006
Principles for the operation of a mine waste facility	These principles are constituted in attachment 6 and 7 of the General Federal Mining Ordinance (ABBergV) and contain information such as the location, company name or comprehensiveness of security measues. Also, financial measures are included to guarantee a future decommisioning of mine waste facilities.	
Criteria that should be met by projects for the reclamation of areas after the mining operations	The federal mining act defines “reclamation” as a proper layout of the claimed surface with regard to the public interest and to extent required by circumstances. An assignment of land is only legal if the responsible party has taken care of the reclamation to an extent, where the surface has gained an increase of value due to reclamation measurements. Further criteria on reclamation and the target of achieving a “natural condition” can be found in the Federal Nature Conservation Act (BNatSchG). If local measurements don’t fit the criteria, compensation (money) and replacement measures elsewhere can serve as a substitute (state law).	• §§4 (4); 55 (1) No. 7; 81 (2) Federal Mining Act (BBergG) in force 08.1980, current version 06.2021 • §1 (5) Federal Nature Conservation Act (BNatSchG), in force 12.1976, updated 03.2010, current version 12.2022 • §31 State Nature Conservation Act North-Rhine Westphelia (LnatSchG NRW), in force 08.1994, updated 11.2016, current version 02.2022

Main categories	Legal description	Legal basis
The principles of nature protection and the principles of reclamation of areas after mining operations to protect nature	These principles are determined by a future land use and the linked legal implications. Frequently former mining areas become nature reserves, but in many cases just because the brown field lacks potential investors.	• Federal Nature Conservation Act (BNatSchG), in force 12.1976, updated 03.2010, current version 12.2022
Environmental impact assessments	An environmental impact assessment is not indispensable, as it depends on the future land use of the former mining area, whether it's needed or not. Subjects to an assessment can be found in attachment 1 of the Federal Environmental Impact Assessment Act. If the mining activity needs an environmental impact assessment in the case of a planning approval procedure, it is posted within the mine operating plan.	• §57a (2) Federal Mining Act (BBergG) in force 08.1980, current version 06.2021 • Federal Environmental Impact Assessment Act (UVPG), in force 02.1990, current version 02.2023 • §§72 – 78 Administrative Procedures Act (VwVfG), in force 01.1977, updated 01.2003, current version 08.2021
Principles of reclamation	The relevant conservation goals within the Federal Nature Conservation Act derive from EU-Directive 92/43/EEC, the "Habitats Directive", as well as EU-Directive 2009/147/EC, the "Birds Directive". Protected areas following these directives qualify the Naura-2000 Network. At least 10% of each Federal state is supposed to consist as biotope network. Reclaimed land can be part of this, however there is a catalogue of various land use types adding to the network (§20 (2) BNatSchG).	• §7 (1) No. 9 & 10; 20 (1) & (2) Federal Nature Conservation Act (BNatSchG), in force 12.1976, updated 03.2010, current version 12.2022 • EU-Directive 92/43/EEC, in force 06.1992 • EU-Directive 2009/147/EC, in force 10.2010
Nature conservation	Protecting nature or landscape is done via declaration as an act and in regard to EU-Directive 2001/41/EC, which regulates environmental assessment procedure. Therefore, an environmental impact assessment would be mandatory.	• §22 Federal Nature Conservation Act (BNatSchG), in force 12.1976, updated 03.2010, current version 12.2022 • EU-Directive 2001/41/EC, in force 07.2001
Consent to carry out reclamation work	Appointed in mandatory mine closure plan - especially §53 (1) BBergG. The responsible mining authority operates as mining supervisor and approves the reclamation work to be carried out.	• §§53 (1); 69 Federal Mining Act (BBergG) in force 08.1980, current version 06.2021
Reclamation obligation	Polluter-pays principle: Mining companies are obliged to carry out reclamation work in areas where their mining activities have been carried out. Prevention principle: Prevention is preferred to compensation and reclamation. Corresponding efforts should be highlighted in operating, waste management and closing plans.	• §§13; 15 Federal Nature Conservation Act (BNatSchG), in force 12.1976, updated 03.2010, current version 12.2022
Reclamation of post-mining areas must be in accordance with the arrangements of land	Spatial planning objectives must be taken into consideration by the mining authority, when approving operational and closing plans. If more than 300 persons are affected by the plans or the affected are not conclusive, the	• §48 (2) Federal Mining Act (BBergG) in force 08.1980, current version 06.2021

Main categories	Legal description	Legal basis
use plans and other applicable legal acts	plan needs to be displayed to the public. This involves a consultation and consideration process.	
Obligation to obtain a decision on the conditions of development and land use	Land needs to be relinquished from mining supervision. Afterwards the land use usually devolves from “mining” to an “industrial” notation and will be treated as such, until the planning body and politics transpose the land use in a legal manner. For further development additional ownership issues have to be solved.	• §69 (2) Federal Mining Act (BBergG) in force 08.1980, current version 06.2021
Study of conditions and directions of spatial development	There are various instruments and procedures in German planning law to gain insight on this, but nothing mandatory.	n/a

Table 5. Summary of the **German** legal framework regarding **RES projects**

Main categories	Wind farm	Solar farm	Hydrogen	Legal basis
Energy potential related to meteorological/ topographic conditions	Federal extension targets, e.g. • Wind (onshore): 2030 115 GW | 2040 160 GW • Wind (onshore): between 0,5% and 2,2% of every Federal state area until 2032 (depending on the Federal state) • Wind (offshore): 2030 30 GW | 2045 70 GW • Solar: 2030 215 GW | 2040 400 GW Investor must investigate the energy resource to calculate the resulting power output and prove profitability of an investment. However, public authorities must consider wind potentials in their planning approaches and approval planning as they must commit to an expedient urban development. In the state of NRW there is a GIS-system operated by the Federal State environmental agency (LANUV) for measuring renewable energy potentials: • https://www.energieatlas.nrw.de/site/planungskarten/wind • https://www.energieatlas.nrw.de/site/karte_solarkataster			• §4 German Renewable Energy Sources Act (EEG), in force 04.2000, updated 08.2014, current version 01.2023 | • Attachment 1 Wind Energy Area Requirement Act (WindBG), in force 02.2023 | • §1 Offshore Wind Energy Act (WindSeeG), in force 01.2017, current version 01.2023 • §1 (3) Federal Building Code (BauGB), in force 10.1960, updated 11.2017, current version 02.2023
Rights to use the land	Land needs to be relinquished from mining supervision. Afterwards the land use usually devolves from “mining” to an “industrial” notation and will be treated as such. Consisting spatial law obligated to use the land as an owner towards erecting			• §69 (2) Federal Mining Act (BBergG) in force 08.1980, current version 06.2021 • § 2 Wind Energy Area Requirement Act (WindBG),

Main categories		Wind farm	Solar farm	Hydrogen	Legal basis
		renewable energy: • Regions are obliged to locate priority areas for wind energy in their regional plans at least until 02.2024 (f.ex. ~2000 ha at Ruhr Area) • Federal building code is fundamental right of approval for wind and solar energy. • State law (state building code) substantiates federal law as right of approval. • The German Renewable Energy Sources Act (EEG) regulates on national level all subsidized renewable energy projects and its approval.			in force 02.2023 • §35 Federal Building Code (BauGB), in force 10.1960, updated 11.2017, current version 02.2023 • E.g. §37 German Renewable Energy Sources Act (EEG), in force 04.2000, updated 08.2014, current version 01.2023 •
Geotechnical conditions of the site		Hard coal waste dumps were not meant for building installations. Requirements for structural stability and other specifications/ standards follow certain DIN standards and are required for the approval planning by the responsible authority. Requirements of soil protection and the contaminated sites ordinance have to be taken into account when approving a project.			• Guideline for Wind Energy Plants - Effects and Structural Stability for Tower and Foundation (RiLi-WEA), published 10.2012 by the German Institute for Construction Technology (DIBt), updated 03.2015 • Serves as catalogue for DIN Standards • Guideline can be state law (f.ex. Lower Saxony) • Federal Soil Protection Act (BBodSchG), in force 01.03.1999, current version 10.2017
Grid limitations	Grid connection conditions	Must be agreed with regional power grid operator. If the grid is not capable of including the power source, the regional power grid operator is obliged to expand the grid accordingly. A grid compatibility test is usually done by the grid operator beforehand. Technical specification can be found in norms of relevant technical institutes such as VDE (Association of Electrical, Electronic & Information Technologies).		The construction of a hydrogen grid is of outstanding public interest until the 31st December 2025 (at least). Therefore, setting up a national grid is prioritised at the moment. In most other cases the hydrogen grid is handled as other gas supply lines. Usually, the route planning demands a formalised planning approval	• German Renewable Energy Sources Act (EEG), in force 04.2000, updated 08.2014, current version 01.2023 • Ordinance on System Services by Wind Energy Plants (VO-SDLWindV), published 07.2009, current version 10.2016 • §43l Federal Energy Act (EnWG), in force 12.1935; updated 07.2015, current version 01.2023 • §§72 – 78 Administrative Procedures Act (VwVfG), in force 01.1977, updated 01.2003, current version 08.2021 • Technical Connection Rules Maximum Voltage (VDE-AR-N 4120), published 10.2018 • Technical Connection Rules Medium Voltage (VDE-AR-N 4110), published 04.2022 •

Main categories		Wind farm	Solar farm	Hydrogen	Legal basis
				procedure.	
	Distance to the nearest electric substation	Regional power grid operator determines location of the grid connection, but is obliged to find the economically favorable spot – for both plant and grid operators. Depending on the scale of the project the erection of a substation is necessary.			• §8 German Renewable Energy Sources Act (EEG), in force 04.2000, updated 08.2014, current version 01.2023
Possibility of heavy material transportation to the site		Usually possible, as bulk procedure of larger scale hard coal waste demands suitable roads.			•
Spatial limitations	Established local land use plan	Can be approved outside a legally binding land use plan if it's outside of settlements and there are no opposed interests, as they are" privileged structural installations". Opposing interests are mainly harmful environmental effects (§35 (3) No. 3 BauGB)	Can be approved outside a legally binding land use plan if it's outside of settlements and connected to suitable buildings or if it's connected to linear infrastructure such as highways. Temporal planning and approval are possible as dismantling of PV installations is relatively easy.	n/a	• §35 (1) No. 5 & 8 Federal Building Code (BauGB), in force 10.1960, updated 11.2017, current version 02.2023 • §35 (3) No. 3 Federal Building Code (BauGB), in force 10.1960, updated 11.2017, current version 02.2023
	Distance to residential/nature protection areas	Minimum distance depends on state law, f. ex. • Bavaria 2000m • North Rhine-Westphalia 1000m • Hamburg 400m And guidelines of relevant technical institutes such as FA Wind (Specialised agency Wind Energy on Land). Recommendation of FA Wind is Distance = 10x Turbine Height (Hub Height + Rotor)	n/a	n/a	• §35 (1) No. 5 Federal Building Code (BauGB), in force 10.1960, updated 11.2017, current version 02.2023 • F.ex. Z 10.2-3 "Principle of Distance Space for Wind Energy Spaces" in State Development Plan of North Rhine-Westphalia (LEP), in force 2017 in agreement with LEP-Decree "Renewable Energies", commenced in 02.2023

Main categories		Wind farm	Solar farm	Hydrogen	Legal basis
	Investment on rural land	Agricultural-PV (Agri PV) allows agricultural production whilst producing solar energy. Wind energy plants can be approved on agricultural land without mayor changes on the prevailing land use, yet it impacts the land value calculations.			• DIN SPEC 91434 “Agri-PV-Installations – Requirements for the Agricultural Main Land Use”, published 01.2020 • DIN SPEC 91492 “Agri-PV-Installations – Livestock Requirements”, published 02.2023 • §35 (1) No. 5 Federal Building Code (BauGB), in force 10.1960, updated 11.2017, current version 02.2023 • §§ 3-4 Real Estate Assessment Regulations (ImmoWertV), commenced 01.2010, updated 01.2022
	Distance to public roads	Distances are varying as there is federal and state law on this topic. Federal law restricts or forbids high buildings in a distance of • 40m – 100m Controlled access Highway • 20m – 40m Federal Highway • 20m – 40m State Road • 15m – 40m County Road			• §9 Federal Highway Act (FStrG), in force 08.1953, updated 06.2007, current version 06.2022
	Distance to power transmission lines	Power transmission lines have protective strips varying in size depending on the voltage and size. Wind energy plants are not allowed to protrude in the protective strips. DIN standards regulating distances were superimposed by more current enactments, such as the wind-energy decree of North-Rhine Westphalia.	General safety distance of high voltage power transmission lines for buildings must be obeyed. Individual cases may apply. • 100 kV – 3m - 11m • 380 kV – 5m - 13m		• Din standard transmission lines above AC 1 kV (VDE- 0210-1 & 2-4), published 09.2019
	Location of air traffic	Air traffic has to be considered when constructing certain buildings within a perimeter of 1,5 km of an airstrip. The federal institution for air traffic control submits a statement within the approval process.			• §§ 12; 18a Federal Aviation Act (LuftVG), in force 10.1923, updated 05.2007, current version 08.2021 (planned version 01.2024)

Main categories		Wind farm	Solar farm	Hydrogen	Legal basis
	Location of protected landscape	Nature reserves exclude construction projects that impact preservation, development, or recovery of various protected goods, yet exceptions are possible. Landscape conservation areas allow wind energy plants as long as they are within a planned area according to § 2 Wind Energy Area Requirement Act (WindBG), so called Go-To-Areas, contributing to the federal renewable energy targets.			• §23 (2)- 26 Federal Nature Conservation Act (BNatSchG), in force 12.1976, updated 03.2010, current version 12.2022 • §§ 2 & 5 Wind Energy Area Requirement Act (WindBG), in force 02.2023
Environmental conditions/EIA	Obtaining decision on environmental conditions	An exclusion of harmful effects on environment is the main approval requirement by the Federal Immission Control Act (BImSchG), defining goods to be protected. Wind energy plants above 50m height are part of this right of approval. Smaller ones are subordinated to the individual states building regulations. The current EU emergency ordinance (2022/2577) causes an omission of former environmental assessments. Nevertheless, local authorities have to check on available data to avoid planning errors.			• §§3 & 48 Federal Immission Control Act (BImSchG), in force 03.1974, updated 05.2013, current version 10.2022 • Art. 6 EU-Ordinance 2022/2577, in force 12.2022 • §23 (2) – 26 & 67 (1) Federal Nature Conservation Act (BNatSchG), in force 12.1976, updated 03.2010, current version 12.2022 • German Noise Pollution Prevention Regulation (TA Lärm) • §35 Federal Building Code (BauGB), in force 10.1960, updated 11.2017, current version 02.2023
	Location of nature protection areas	Nature reserves exclude construction projects that impact preservation, development, or recovery of various protected goods, yet exceptions are possible.			
	Acoustic influence	§48 BImSchG initiate the creation of the German Noise Pollution Prevention Regulation (TA Lärm), which is responsible for assessing reasonableness of projects such as wind energy plants in regards of acoustic influence. TA Lärm substantiates the legal scale by linking acoustic limits to certain area categories and day times.			
	Location of birds and bats corridors	As a result of the implementation of the EU emergency ordinance wind energy plant located within a planned area according to §2 Wind Energy Area Requirement Act (WindBG) don't need a species conservation examination or an environmental impact assessment, as long as the designating regional plan or legally binding land-use plan did a strategic environmental assessment. Exceptions to this rule are Natura-2000-areas, like bird sanctuaries, national parks and other nature reserves with special protection status.			

Table 6. Summary of the **Polish** legal framework regarding **reclamation**

Main categories	Legal description	Legal basis

Geotechnical conditions of the site	Ground investigation report, geotechnical design report and geological-engineering documentation must be delivered in addition to construction design and geotechnical opinion	• Act of July 7, 1994 Construction Law (Journal of Laws of 2020, item 1333) • Regulation of the Minister of Transport, Construction and Maritime Economy of 25 April 2012 on the determination of geotechnical conditions for the foundation of buildings (Journal of Laws of 2012, item 463) • Act of 9 June 2011 Geological and Mining Law (Journal of Laws 2020, item 1064) • Regulation of the Minister of the Environment of November 18, 2016 on hydrogeological documentation and geological-engineering documentation (Journal of Laws of 2016, item 2033)
Reclamation responsible party	The party causing the loss or reduction of the use value of the land shall be obliged to rehabilitate the land at its own expense. If the industrial activity causing the obligation to rehabilitate the land is carried out by several parties, the obligation is incumbent on each of them, according to the extent of the activity causing the need for rehabilitation	• Act of 3 February 1995 on the protection of agricultural and forestry land
Time for land reclamation	In the case of all mining plants, land reclamation should be carried out as the land becomes redundant for the operation of the mining plant and shall be completed within 5 years of the cessation of industrial activities.	
Controlling the implementation of land reclamation	Ensuring compliance with land reclamation obligations involves conducting annual checks to confirm that the treatments performed align with the land reclamation documentation, including adherence to technical requirements and completion within specified timeframes.	
Mining waste management	As part of the mining waste management process, the mining waste holder is responsible for creating a comprehensive plan that outlines the strategy for closing the mining waste disposal facility. This plan should include a detailed description of the approach for land reclamation, post-closure procedures, and the monitoring strategy. It is mandatory for a mining waste facility to carry out monitoring activities both during and after its operation.	• Act of 10 July 2008 on mining waste • Act of 14 December 2012 on waste

Principles for the operation of an mining waste facility	The waste holder must: • operate facility in a way that prevents soil and water deterioration caused by seepage water, including determining the facility's water balance. They must also prevent these effects after the facility is closed; • prevent the emission of dust and gases from the facility. • ensure the stability and chemical stability of the facility, including ongoing control of the facility's stability; • if the facility stores waste containing combustible parts, the waste holder must implement technical measures to prevent fires.	
Criteria that should be met by projects for the reclamation of areas after the mining operations	In accordance with the law, reclamation refers to the process of restoring or enhancing the utility and natural values of degraded or devastated land by reshaping the landform, improving physical and chemical properties, regulating water relations, restoring soils, reinforcing slopes, and constructing necessary roads. A decision on reclamation completion confirms the successful completion of this process. The assessment of whether reclamation has been completed should not be based on the scope of the work performed but on whether the land's utility values have been restored through appropriate treatments.	• Act of agricultural and forested land protection of February 3, 1995
Environmental impact assessments	The environmental impact assessment procedure plays a crucial role in the planning process and serves as a vital tool for achieving sustainable development. To ensure that reclamation efforts align with this principle, all reclamation projects are subject to strategic environmental impact assessments during the spatial planning stage, before undertaking specific reclamation activities.	• Act of 27 April 2001 Environmental Protection Law • Act of 3 Ovtober, 2008 on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessment • Regulation of the Council of Ministers of September 10, 2019 on projects that may have a significant impact on the environment
Principles of reclamation	These principles govern various aspects of the reclamation process, including the procedures for conducting the work, land management after reclamation, and the monitoring of reclamation effects.	• Act of 9 June 2011 Geological and Mining Law • Act of agricultural and forested land protection of February 3, 1995 • Regulation of 8 December, 2017 of the Minister of the Environment on mining plant operation plans • regulations on the operation of mining plants: – Regulation of the Minister of Energy of November 23, 2016 on detailed

		requirements for the operation of underground mines; – Regulation of the Minister of Economy of 25 April 2014 on detailed requirements for the operation of mining plants extracting minerals through boreholes – Regulation of the Minister of Economy of April 8, 2013 on detailed requirements for opencast mining operations
Nature conservation	Reclamation of post-mining areas should be carried out in accordance with the principles of nature protection. Environmental impact assessment is necessary for selected activities specified in Regulation on projects that may have a significant impact on the environment. As part of this assessment, the need to include Natira 2000 areas should also be highlighted. The executive authority of the commune, such as the commune head, mayor, or city president, is typically responsible for conducting environmental impact assessments. In some cases, other authorities such as the General Director for Environmental Protection or the director of the regional directorate of the State Forests may also be involved.	• Act of April 27, 2001. Environmental Protection Law • Act of 3 February 1995 on the protection of agricultural and forestry land • Act of 3 Ovtober, 2008 on the provision of information on the environment and its protection, public participation in environmental protection and environmental impact assessment • Regulation of the Council of Ministers of September 10, 2019 on projects that may have a significant impact on the environment
Consent to carry out reclamation work	Companies engaged in mining activities must obtain permission to conduct mining and reclamation work. The basic document regulating the reclamation process is the **reclamation and development decision**. Such a decision is issued by the staroste, after obtaining the opinion of: the director of the relevant regional mining office - in relation to mining activities, the director of the regional directorate of the State Forests or the director of the national park - in relation to land with a planned forest reclamation direction and the commune head (mayor, president of the city).	• Act of 3 February 1995 on the protection of agricultural and forestry land
Reclamation obligation	Mining companies are obliged to recultivate all areas transformed as a result of mining activities, which caused the loss of their value in use.	• Act of 9 June 2011 Geological and Mining Law
Supervision of reclamation work	The application of legal provisions related to reclamation can be supervised by multiple entities, including the Minister of Agriculture and Food Economy, the Minister of Environmental Protection, Natural	• Act of 9 June 2011 Geological and Mining Law • Act of 3 February 1995 on the protection of agricultural and forestry land

	Resources, and Forestry, marshals of voivodships, the staroste, the director of the regional directorate of State Forests, the director of the national the commune head, the voivodship sanitary inspector as well as mining supervision authorities.	
Preparation of reclamation plans	There are several ways to document remediation: – Land reclamation in mining plants must follow the guidelines outlined in the approved **reclamation documentation**, which specifies the direction, scope, method, and date of reclamation. – The **mining plant operation plan** includes a traffic plan that emphasizes environmental protection and the reclamation of land after mining activities. – In the event of a mining plant's liquidation, the recultivation procedure is outlined in the **operation plan of the liquidated plant**. Additionally, an administrative decision issued by the staroste is required.	• Act of 9 June 2011 Geological and Mining Law • Regulation of 8 December, 2017 of the Minister of the Environment on mining plant operation plans • regulations on the operation of mining plants: - Regulation of the Minister of Energy of November 23, 2016 on detailed requirements for the operation of underground mines; - Regulation of the Minister of Economy of 25 April 2014 on detailed requirements for the operation of mining plants extracting minerals through boreholes - Regulation of the Minister of Economy of April 8, 2013 on detailed requirements for opencast mining operations • Act of 3 February 1995 on the protection of agricultural and forestry land
Reclamation of post-mining areas must be in accordance with the arrangements of land use plans and other applicable legal acts	While there is no specific provision requiring consideration of the local plan's provisions for land development after exploitation, the staroste consults with the commune head (mayor or president of the city) when issuing a reclamation decision. The commune head should take into account the arrangements resulting from the local spatial development plan or study.	
Obligation to obtain a decision on the conditions of development and land use	Mining activities must align with the real estate's designated purpose in the local spatial development plan or study of conditions and directions of spatial development of the commune. Mining regions and areas must also be included in these documents. The study and local plans promote environmental resource management and natural balance through rational land use and management programs, including areas where mineral deposits are exploited. Additionally, the plans specify methods for developing degraded areas resulting from human activity.	• Act of 9 June 2011 Geological and Mining Law • Act of April 27, 2001. Environmental Protection Law • Act of March 27, 2003 on spatial planning and development

Study of conditions and directions of spatial development	The study provides the basis for decisions on the formation of space in a given area, including post-mining areas. The study determines, among other things, the objectives and principles of land development, and also takes into account the requirements of environmental protection and prevention of damage to the environment	• Act of March 27, 2003 on spatial planning and development

Table 7. Summary of the **Polish** legal framework regarding **RES projects**

Main categories	Wind farm	Solar farm	Hydrogen	Legal basis
Energy potential related to meteorological/topographic conditions	Energy resource must be investigated in order to calculate the resulting power output and prove profitability of an investment			-
Rights to use the land	The location of a wind or photovoltaic power plant is based only on the local plan			• Act of July 7, 1994 Construction Law • Act of March 27, 2003 on spatial planning and development
	Depending on the design of the installation: ● a building permanently attached to the ground - a building and occupancy permit is required; ● structures not permanently attached to the ground - no need for a building permit.	Devices with an installed capacity of more than 50 kW always require a building permit		

Geotechnical conditions of the site		Ground investigation report, geotechnical design report and geological-engineering documentation must be delivered in addition to construction design and geotechnical opinion			• Act of July 7, 1994 Construction Law (Journal of Laws of 2020, item 1333) • Regulation of the Minister of Transport, Construction and Maritime Economy of 25 April 2012 on the determination of geotechnical conditions for the foundation of buildings (Journal of Laws of 2012, item 463) • Act of 9 June 2011 Geological and Mining Law (Journal of Laws 2020, item 1064) • Regulation of the Minister of the Environment of November 18, 2016 on hydrogeological documentation and geological-engineering documentation (Journal of Laws of 2016, item 2033)
Grid limitations	Grid connection conditions	Must be agreed with regional power grid operator			• Act of April 10, 1997 Energy Law (Journal of Laws 2020, item 833)
	Distance to the nearest electric substation	When selecting the land for the investment, the distance from medium-voltage power lines and main power point (GPZ) should be taken into account. This is one of the elements assessed by the regional power grid operator.			-
Possibility of heavy material transportation to the site		Usually possible; various roads available in the vicinity of the former mine			-
Spatial limitations	Established local land use plan	The plan must indicate possibility for wind power plant construction	The plan must indicate possibility for solar plant construction; if there is no local land use plan established, a zoning and land use decision for a plot of land in question must be obtained		• Act of 27 March 2003 on spatial planning and development • Act of May 20, 2016 on wind farm investments

	Distance to residential/nature protection areas	Distance to residential - at least 700 m Distance to nature protection areas - not less than ten times the height of the wind farm	No fixed standards regarding the minimum distance		• Act of May 20, 2016 on wind farm investments (Journal of Laws of 2016, item 961)
	Investment on rural land	If the land was reclaimed for agricultural purposes, it has to be excluded from agricultural use (regardless of the class of agricultural land)			• Act of February 3, 1995 on the protection of agricultural and forest land (Journal of Laws of 2017, item 1161)
	Distance to public roads	Minimum distances are specified in the Act on public roads depending on the type of road and whether the investment is planned in built-up or undeveloped areas. If smaller, a consent of a relevant road administrator must be obtained. Minimum distances for: 1. Highway: 30-50 m 2. Expressway: 20-40 m 3. Public road: ● national: 10-25 m ● voivodship, poviat: 8-20 m commune: 6-15 m			• Act of March 21, 1985 on public roads (Journal of Laws 2020, item 470)
	Distance to overhead power transmission lines	Minimum distances are specified by power distribution companies and depend on voltage of the power lines	Location of a power plant in a close distance to a power line, especially within a technical lane going along the line, must be agreed with a relevant power distribution company		• Regulation of the Minister of Infrastructure of February 6, 2003 on occupational health and safety during construction works (Journal of Laws 2003, No. 47, item 401) • Regulation of the Minister of Health of 17 December 2019 on the permissible levels of electromagnetic fields in the environment (Journal of Laws of 2019, item 2448)

	Location of air traffic	Areas with limited development of constructed objects due to air traffic must be checked in the local land use plan	n/a		• Act of July 3, 2002, Aviation Law (Journal of Laws 2020, item 1970)
	Location of protected landscape	Priority landscapes may be indicted in local land use plans. Restrictions on spatial development set for landscape protection zones (that are designated in landscape parks and protected landscape areas) are binding for local land use plans/zoning and land use decisions			• Act of April 24, 2015 amending certain acts in connection with the strengthening of landscape protection tools (Journal of Laws of 2015, item 774) • Act of April 16, 2004 on nature protection (Journal of Laws of 2020, item 55)
Environmental conditions/EIA	Obtaining decision on environmental conditions	Required for wind power plants of a total height of more than 30 m or located within nature protection areas	Required for photovoltaic farms covering the area larger than 1 ha or 0.5 ha if located within a nature protection area		• Act of May 20, 2016 on wind farm investments (Journal of Laws of 2016, item 961) • Act of 27 April 2001 Environmental Protection Law (Journal of Laws 2020, item 1219) • Act of April 16, 2004 on nature protection (Journal of Laws of 2020, item 55) • Act of 3 October 2008 on the provision of information about the environment and its protection, public participation in environmental protection and environmental impact assessments (Journal of Laws 2020, item 283) • Regulation of the Council of Ministers of September 10, 2019 on projects that may significantly affect the environment (Journal of Laws 2020, item 1333) • Regulation of the Minister of the Environment of 14 June 2007 on permissible noise levels in the environment (Journal of Laws of 2019, item 1839)
	Location of nature protection areas	Location of a power plant within some nature protection areas (such as national parks, nature reserves, landscape parks and Natura 2000 sites) is not possible. Location within other nature protection areas or its impact on the nearest nature protection areas is important in terms of EIA	Location of a power plant within a nature protection area or its impact on the nearest nature protection areas is important in terms of EIA		
	Acoustic influence	If a distance between a wind power plant and a residential area must be at least ten times a total height of the plant, the noise standards are always met	Noise analysis may need to be performed with regard to permissible noise levels during the day and night regarding a transformer station		

		The Regulation of the Minister of the Environment in Poland sets permissible noise levels for different areas to protect the environment against noise pollution. The document specifies the acoustic noise levels for various areas based on their intended use, including residential areas, hospitals and nursing homes, areas for children and youth, spa areas, recreational areas, and residential and commercial areas.		
	Location of birds and bats corridors	Monitoring of birds and bats, usually one year-long, is required for an environmental impact assessment report		
	Location of protected landscape	Impact on landscape must be analyzed in frame of EIA		

Table 8. Summary of the **Greek** legal framework regarding **reclamation**

Main categories	Legal description	Legal basis
Geotechnical conditions of the site	The location and method of disposal, as well as the final structure of the mining waste deposits, must be chosen during the preparation of the **technical study (before operation)**, in order to ensure the rational operation of the project, the stability of the slopes (with compaction of the material, where necessary) or dams, where appropriate, and the possibility of restoring the landscape. There is no technical study after the closure of the mine, only for the plantations.	• Mining Code (Ministerial Decision D7/A/oik. 12050/2223/2011 (FEK 1227/B` 14.6.2011) "Regulation on Mining and Quarrying Operations" Article 87
Reclamation responsible party	Mine operator for mines in general, in the case of the Delignification Zones in Greece, PPC S.A. is the responsible party.	• Mining Code (Ministerial Decision D7/A/oik. 12050/2223/2011 (FEK 1227/B` 14.6.2011) "Regulation on Mining and Quarrying Operations" Article 89 • Ministerial Decision 46294/2013 (FEK 2001/B` 14.8.2013) Standard Environmental Commitments for works and activities of category B of the 5th group "Extractive and other relevant activities" of Annex V, of the active Ministerial Decision 1958/2012 (FEK 21/B), as it has been amended, especially for works and activities of No. 10 (RES) • Ministerial Decision 39624/2209/E103/2009 (FEK 2076/B` 25.9.2009) Measures, conditions and constraints for mining waste management, in compliance with the legal provisions of the Directive 2006/21/EC of the 15th March 2006 of the European Parliament on the "management of waste from extractive industries and the amendment of the Directive 2004/35/EC" of the European Parliament of the 15th March 2006. Article 13 • Law 4956/2022 Ratification of the Programming Agreement of paragraph 4 of article 5 of law 4759 between the Greek State and the anonymous companies with the title "METAVASI S.A" and "PPC S.A."

		• Law 4759/2020 (FEK 245/A` 9.12.2020) Modernisation of spatial and urban planning legislation and other provisions.
Time for land reclamation	Rehabilitation measure are to be implemented as early in the mining operation as possible in order for the rehabilitation processes to be completed on time.	• Mining Code (Ministerial Decision D7/A/oik. 12050/2223/2011 (FEK 1227/B` 14.6.2011) "Regulation on Mining and Quarrying Operations" Article 89
Controlling the implementation of land reclamation	Same as "Reclamation responsible party"	Same as "Reclamation responsible party"
Mining waste management	The location and method of disposal and the final configuration of the tailings disposal facilities must be chosen in the preparation of the technical study. When the operator reintroduces extractive waste into excavation voids that is produced from either surface or underground mining for rehabilitation and construction purposes, the operator shall take appropriate measures.	• Mining Code (Ministerial Decision D7/A/oik. 12050/2223/2011 (FEK 1227/B` 14.6.2011) "Regulation on Mining and Quarrying Operations" Article 90 • Ministerial Decision 39624/2209/E103/2009 (FEK 2076/B` 25.9.2009) Measures, conditions and constraints for mining waste management, in compliance with the legal provisions of the Directive 2006/21/EC of the 15th March 2006 of the European Parliament on the "management of waste from extractive industries and the amendment of the Directive 2004/35/EC" of the European Parliament of the 15th March 2006. Article 13
Principles for the operation of a mining waste facility	The operator is obliged to apply Best Available Techniques (BAT) during the exploration, extraction and disposal of waste (mining and non-mining). After the closure of a waste facility, the operator shall without delay send information to the competent authority, as appropriate, on any event or development likely to affect the stability of the waste facility and on any serious adverse effects on the environment identified during the control and monitoring procedures. Where and at the frequency specified in the AEPO, the operator shall report to the competent authority the results of the monitoring, based on aggregated data, in order to demonstrate compliance with the conditions of the environmental permit and to improve knowledge of the behaviour of	• Mining Code (Ministerial Decision D7/A/oik. 12050/2223/2011 (FEK 1227/B` 14.6.2011) "Regulation on Mining and Quarrying Operations" Article 89 • Ministerial Decision 39624/2209/E103/2009 (FEK 2076/B` 25.9.2009) Measures, conditions and constraints for mining waste management, in compliance with the legal provisions of the Directive 2006/21/EC of the 15th March 2006 of the European Parliament on the "management of waste from extractive industries and the amendment of the Directive 2004/35/EC" of the European Parliament of the 15th March 2006. Article 15

	the waste and the waste facility.	• Ministerial Decision 170225/2014 (FEK 135/B` 27.1.2014) Specification of the content of the applications for environmental licensing of works and activities of category A' of the active Ministerial Decision 1958/2012 (21/B), according to article 11 of the Law 4014/2011 (209/A) and all other relevant specifications.
Criteria that should be met by projects for the reclamation of areas after the mining operations The principles of nature protection and the principles of reclamation of areas after mining operations to protect nature Environmental impact assessments Principles of reclamation Nature conservation	The criteria and requirements/specification used in all aspects of reclamation must be stated in the MPE studies for mining projects and activities. An approved MPE leads to obtainment of a AEPO, which is obligatory for any new project of activity in Greece, with environmental impact. For projects located in Natura 2000 sites, Special Ecological Assessment studies are also prepared. MPE studies state in detail all remedial or preventive measures and actions to monitor environmental media and parameters to avoid or minimise impacts or to remedy or restore the environment.	• Law 4014/2011 (FEK 209/A` 21.9.2011) Environmental licensing of projects and activities, regulation of arbitrary buildings in connection with the creation of an environmental balance and other provisions under the responsibility of the Ministry of Environment. • Ministerial Decision 170225/2014 (FEK 135/B` 27.1.2014) Specification of the content of the applications for environmental licensing of works and activities of category A' of the active Ministerial Decision 1958/2012 (21/B), according to article 11 of the Law 4014/2011 (209/A) and all other relevant specifications.
Consent to carry out reclamation work Reclamation obligation Supervision of reclamation work Preparation of reclamation plans Reclamation of post-mining areas must be in accordance with the arrangements of land use plans and other applicable legal acts	As stated in AEPO and the MPE studies, the operator in obliged and responsible to plan, implement, supervise and fund **all** reclamation works carried out during and after operation. For the Delignification Zones in Greece, PPC S.A. is the operator, with METAVASI S.A. co-supervising the reclamation projects.	• Mining Code (Ministerial Decision D7/A/oik. 12050/2223/2011 (FEK 1227/B` 14.6.2011) "Regulation on Mining and Quarrying Operations" • Ministerial Decision 170225/2014 (FEK 135/B` 27.1.2014) Specification of the content of the applications for environmental licensing of works and activities of category A' of the active Ministerial Decision 1958/2012 (21/B), according to article 11 of the Law 4014/2011 (209/A) and all other relevant specifications. • Ministerial Decision 46294/2013 (FEK 2001/B` 14.8.2013) Standard Environmental Commitments for works and activities of category B of the 5th group "Extractive and other relevant activities" of Annex V, of the active Ministerial Decision 1958/2012 (FEK 21/B), as it has been amended, especially for works and activities of No. 10 (RES) • Law 4956/2022 Ratification of the Programming

		Agreement of paragraph 4 of article 5 of law 4759 between the Greek State and the anonymous companies with the title “METAVASI S.A” and “PPC S.A.” • Law 4872/2021 Just Transition Development, regulation for special lignite transition issues and other urgent provisions • Law 4759/2020 (FEK 245/A` 9.12.2020) Modernisation of spatial and urban planning legislation and other provisions.
Obligation to obtain a decision on the conditions of development and land use	To change the land use of a reclaimed mining site, a new AEPO must be obtained by the operator for the new land use (whether is the mining operator or a different operator), by preparing a new MPE. For the Delignification Zones in Greece, PPC S.A. or any other operator must obtain new AEPOs for new projects. Reclaimed lands that will not be further utilised by PPC S.A., are transferred to METAVASI S.A. and the Greek State and will remain under the administration, management and operation of the implementing body of the Spatial Development Plan, until their configuration and delivery by the body to the municipality concerned or to the Greek State. This handover may take place in stages.	• Law 4014/2011 (FEK 209/A` 21.9.2011) Environmental licensing of projects and activities, regulation of arbitrary buildings in connection with the creation of an environmental balance and other provisions under the responsibility of the Ministry of Environment. • Ministerial Decision 170225/2014 (FEK 135/B` 27.1.2014) Specification of the content of the applications for environmental licensing of works and activities of category A’ of the active Ministerial Decision 1958/2012 (21/B), according to article 11 of the Law 4014/2011 (209/A) and all other relevant specifications. • Law 4759/2020 (FEK 245/A` 9.12.2020) Modernisation of spatial and urban planning legislation and other provisions. • Law 4872/2021 Just Transition Development, regulation for special lignite transition issues and other urgent provisions. Articles 29, 35.
Study of conditions and directions of spatial development		

Table 9. Summary of the **Greek** legal framework regarding **RES projects**

Main categories	Wind farm	Solar farm	Hydrogen	Legal basis
Energy potential related to meteorological/topographic conditions	Preparation of an energy study to document electricity generation potential and documentation of RES potential			• Ministerial Decision 114746/4230/2020 (FEK 5291/B` 01.12.2020) • Regulation on Certificates for Producers of Electricity from RES and CHP and Certificates for Producers of Electricity from Special • Projects of Renewable Energy Sources (RES) and • High Efficiency Cogeneration of Heat and Power (HECHP). • Ministerial Decision 14810/2011 (FEK 2373/B` 25.10.2011) • Electricity Production Licensing Regulation • using Renewable Energy Sources and • High Efficiency Cogeneration of Heat and Power (HECHP). • Law 3468/2006 (FEK 129/A/27.6.2006). Production of electricity from Renewable Energy Sources • Energy Sources and Cogeneration • and High Efficiency Cogeneration of Heat and Power and other provisions.
Rights to use the land	Since 2011, Environmental Impact Assessment (MPE) approval provides also the land-use right if the installation site is a public forestal area (permission for intervention). Furthermore, expropriation rights are obtained in case of private land as part of the MPE approval.			• Law 4956/2022 (FEK 140/A/19.07.2022) • Ratification of the Programming Agreement of paragraph 4 of article 5 of law 4759/2020 between the Greek State and the anonymous companies with the title “METAVASI S.A” and “PPC S.A.” • Law 4014/2011 (FEK 209/A` 21.9.2011) • Environmental licensing of projects and activities, regulation of arbitrary buildings in connection with the creation of an environmental balance and other provisions under the responsibility of the Ministry of Environment. • Ministerial Decision 49828/2008 – (FEK 2464/B/3.12.2008) • Special Framework for Spatial Planning and

					Sustainable Development for RES (EPHSAA)
Geotechnical conditions of the site		Prior to the construction of the project, field investigation work is required as part of the geotechnical study programme.			According to Greek Anti-Seismic Regulation • (FEK 270/B`/16.3.2010) • (FEK 1154/B`/12.8.2003) • (FEK 1153/B`/12.8.2003) • (FEK 781/B`/18.6.2003) • (FEK 1564/B`/22.12.2000) • (FEK 2184/B`/20.12.1999) • (FEK 611/B`/22.7.1996) • (FEK 588/B`/6.7.1995) • (FEK 534/B`/20.6.1995) • (FEK 774/B`/12.10.1994) • (FEK 613/B`/12.10.1992)
Grid limitations	Grid connection conditions	A non-binding, provisional, Grid Connection Offer (GCO) is issued by the System Operator, immediately after the issuance of the Production License. The binding GCO, is issued by System Operator after MPE Approval.			• Law 3468/2006 (FEK 129/A/27.6.2006). • Production of electricity from Renewable Energy Sources • Energy Sources and Cogeneration • and High Efficiency Cogeneration of Heat and Power and other provisions.
	Distance to the nearest electric substation	As defined in the terms of connection of the installation (high voltage) and PPC S.A. (medium and low voltage)			
Possibility of heavy material transportation to the site		It is being considered for environmental licensing			• Law 4014/2011 (FEK 209/A` 21.9.2011) • Environmental licensing of projects and activities, regulation of arbitrary buildings in connection with the creation of an environmental balance and other provisions under the responsibility of the Ministry of Environment.
Spatial limitations	Established local land use plan	The plan must indicate possibility for wind power plant construction	The plan must indicate possibility for solar plant construction; Other areas or zones subject to a special land use regime, under which the siting of solar energy		• Ministerial Decision 49828/2008 – (FEK 2464/B/3.12.2008) • Special Framework for Spatial Planning and Sustainable Development for RES (EPHSAA)

			installations is not allowed		
	Distance to residential/nature protection areas	The distance must be 1.000 m from the boundary of the settlement or 1.500 m from the boundary of the traditional settlement	No fixed standards regarding the minimum distance		
	Investment on rural land	Post-mining land uses have not been defined yet in the Delignification Zones			
	Distance to public roads	Safety distance 1.5d = 225 m from the boundaries of the expropriation zone of the road or railway network respectively, where (d) the diameter of the wind turbine blade at least 500 m.	No fixed standards regarding the minimum distance		
	Distance to overhead power transmission lines	Safety distance 1.5d = 225 m from the boundaries of the crossing limits of the lines, where (d) the diameter of the wind turbine blade at least 500 m.	No fixed standards regarding the minimum distance ??		
	Location of air traffic	On a case-by-case basis, an opinion from a competent body	n/a		
Environmental conditions/MPE	Obtaining decision on environmental conditions	Depending on the nominal capacity of the projects and their location or not inside a protected area, there are 3 categories, with corresponding licensing authorities. See above in paragraph 8.1.2. for more details.			• Ministerial Decision 1958/2012 (FEK 21/B/13.01.2012) with its modifications. • Classification of projects and activities into categories/subcategories according to their potential environmental impacts as well as into groups of similar projects-activities • Law 4014/2011 (FEK 209/A` 21.9.2011)

	Location of nature protection areas	Location of a wind power plant within areas of environmental interest is decided on a case-by-case basis in the context of AEPO.	Location of a solar power plant within a nature protection area or its impact on the nearest nature protection areas is important in terms of MPE		• Environmental licensing of projects and activities, regulation of arbitrary buildings in connection with the creation of an environmental balance and other provisions under the responsibility of the Ministry of Environment. • Presidential Decree: No. 1180/81 (FEK 293/A/6-10-81) On the regulation of matters related to the establishment and operation of industries, crafts, all kinds of mechanical installations and warehouses and the safeguarding of the environment in general.
	Acoustic influence	The noise generated by the operation of wind turbines must be less than 50dB at the boundaries of their plot and less than 45dB at the boundaries of neighbouring settlements.	n/a		
	Location of birds and bats corridors	If the project's area belongs to a protected area of Natura 2000 Network, the MPE must include a Special Ecological Evaluation study, as determined in Law 4014/2011.			

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