



Brussels, 2.7.2025
C(2025) 4012 final

ANNEX

ANNEX

to the

COMMUNICATION TO THE COMMISSION

Approval of the content of a draft Commission Notice on a Guidance on the establishment of areas for grid and storage infrastructure necessary to integrate renewable energy into the electricity system in line with Article 15(e) of the Renewable Energy Directive

CONTENTS

1. Introduction.....	2
2. Scope of article 15e.....	3
3. Exemptions for Grids and storage projects.....	5
4. Identification of dedicated infrastructure areas.....	6
4.1. Network development plans	8
4.2. Cross-border cooperation for the designation of grid and storage areas for cross-border infrastructure.....	9
4.3. Flexibility Needs Assessments	9
4.4. Environmental considerations	10
4.5. The integration of renewable energy sources	10
4.6. Link between the renewable acceleration areas and areas for grid and storage infrastructure.....	11
4.7. Public Participation.....	11
4.8. Offshore planning	13
4.9. Using Digital tools to support implementation.....	14
5. Assessing the existence of significant environmental impacts	15
5.1. Cooperation and support tools to identify significant environmental impacts.....	17
5.2. Mitigation rulebook	17
5.2.1. Mitigation measures	17
5.3. Compensation measures	19
5.4. Screening of projects in dedicated infrastructure areas	19

1. Introduction

As outlined in the Grids Action Plan¹, in the Clean Industrial Deal (CID) and in the Affordable Energy Action Plan (AEAP), the expedited roll-out of renewable electricity and its integration into the electricity system is central to ensure a steady and secure supply of clean and affordable energy. For this purpose, a key performance indicator in the is the installation of 100 GW of additional renewable electricity capacity each year up to 2030. Both the CID and the AEAP identify cutting permitting times for the deployment of grid, energy storage and renewables projects as an essential aspect to achieve these goals. Experience across regions shows that a swift application of the permitting rules laid down in the Emergency Regulation and in the revised Renewable Energy Directive² (the ‘revised RED’) translated into an accelerated deployment of renewables³.

The concept of areas for grid and storage infrastructure necessary to integrate renewable energy into the electricity system was introduced by Article 15e⁴ of the revised RED in October 2023. To achieve the climate and renewable energy targets, Member States can enable energy infrastructure and storage projects located in such areas to benefit from derogations from certain types of environmental assessments, if the conditions set by Article 15e are met, with the aim to significantly shorten the permitting timelines especially for energy infrastructure projects which currently can last between 2⁵ and, even, 17⁶ years.

Given that significant amounts of renewable energy are ready to be integrated into the grid, given the expected increase in renewable energy production to meet the 2030 climate and energy targets and the 2050 climate neutrality objective, and given how key electrification technologies are to boosting the competitiveness of our industries, the timely development of energy infrastructure is crucial. Thus, Member States should make the best use of the provisions of Article 15e to reduce the time for the required assessments. This provision does not make it mandatory to designate dedicated infrastructure areas for the development of grid and storage projects. However, the Commission has encouraged Member States to use this possibility.

On 28 November 2023, the European Commission adopted a communication on an EU Action Plan for Grids⁷ committing to publish guidance on the designation of dedicated infrastructure areas for grid and storage projects in line with Article 15e of the revised RED. This guidance intends to support the identification and designation process and harmonise the approach across the EU by disseminating best practices.

¹ https://energy.ec.europa.eu/topics/infrastructure/trans-european-networks-energy_en#a-european-grid-action-plan

² Directive (EU) 2018/2001 as amended by Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652, OJ L, 2023/2413.)

³ As described in the AEAP, as a consequence of the application of swifter permitting during the energy crisis in Germany, permits for new onshore wind projects have more than tripled since 2022, ramping up the number of installations by 48% in one year (2023) 43 and about 3,300 km of transmission grids have been approved since Q2 2023, saving 12 months to three years in permitting time.

⁴ In line with these provisions, ‘Member States may adopt one or more plans to designate dedicated infrastructure areas for the development of grid and storage projects that are necessary to integrate renewable energy into the electricity system where such development is not expected to have significant environmental impact, such an impact can be duly mitigated or, where not possible, compensated for’.

⁵ See the 2023 ACER PCI Monitoring Report: https://acer.europa.eu/sites/default/files/documents/Publications/2023_ACER_PCI_Report.pdf

⁶ <https://investor.eliagroup.eu/-/media/project/elia/shared/documents/investor-relations/reports-and-results/reports-for-elia-group/2025/transcript-fy-2024-analyst-call.pdf>

⁷ Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Grids, the missing link - An EU Action Plan for Grids COM/2023/757 final, 28/11/2023, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2023:757:FIN.>)

Some Member States are actively preparing to designate dedicated infrastructure areas, while some others are prioritising the mandatory transposition and implementation of the revised RED, in particular Article 15c on renewables acceleration areas, and plan to subsequently designate dedicated infrastructure areas based on their experience. To designate dedicated infrastructure areas, Member States should, as much as possible, use areas where significant environmental impacts are not expected, where such impacts can be mitigated or, when not possible, compensated for. For this, the practical guidance and best practices specified in the European Commission guidance on energy transmission infrastructure and EU nature legislation should be considered⁸ as well as all other relevant guidance and best practices documents already available.

This guidance aims to support Member States in designating areas where grid and storage infrastructure can be developed with streamlined environmental assessment processes. A series of examples and best practices are identified to support Member States in assessing significant environmental impacts and determining whether such an impact can be duly mitigated or, where not possible, compensated for. Examples of mitigation measures, and of design, construction and operation requirements are also provided. Lastly, the guidance covers the screening of unforeseen significant environmental impacts and describes possible mitigation and compensation measures.

The Technical Support Instrument offers Member States, upon their request, tailor-made assistance to design and implement key investments and reforms on grid and storage infrastructure necessary to integrate renewable energy into the electricity system. Moreover, several Recovery and Resilience Plans of Member States contain measures aiming to support of the procedures and steps needed in the identification and the designation of dedicated grid and storage areas, for example in the case of Lithuania and Portugal. Member States are encouraged to make best use of these possibilities for funding increasing their administrative capacity for setting-up dedicated grid and storage areas and, overall, streamlining permitting procedures.

The guidance emphasises the importance of internal coordination in the designation of the areas between existing and envisaged national plans and strategies. This includes reflecting economic and environmental considerations already accounted for in different planning exercises closely involving the public, communities and industries. Member States are encouraged to prioritize regions that can support and complement the renewables acceleration areas and/or areas with strained or lacking grid capacity, presenting bottlenecks in connecting renewables production to demand centres, with a focus on industrial and urban areas with substantial future electrification needs. The preparation of this guidance was based on an informal targeted stakeholder consultation carried out between 8 November 2024 and 9 December 2024. In this the Commission received input from 39 stakeholders: 16 energy system operators, nine industry associations and non-governmental organisations, eight energy companies, five public authorities, and one energy regulator.

This document is intended uniquely as a guidance. Only the text of EU legislation itself has legal force. The binding interpretation of EU legislation is the exclusive competence of the Court of Justice of the European Union. The views expressed in this guidance are without prejudice to the position that the Commission might take before the Court of Justice.

⁸ Directorate-General for Environment, Guidance on energy transmission infrastructure and EU nature legislation, Publications Office of the European Union, 2018, <https://data.europa.eu/doi/10.2779/827210>

2. Scope of Article 15e and definitions

For the purposes of Article 15e, ‘grid infrastructure’ should be understood as any project to deploy any electricity transmission and distribution assets essential to enable the efficient operation of the electricity system⁹, including, as far as possible cross-border assets.

‘Storage infrastructure’ should be understood as all energy storage assets at transmission and distribution level⁽¹⁰⁾.

Article 15e applies to grid and storage projects that are necessary to integrate renewable energy into the electricity system, thus, excluding, investments in networks related to energy carriers other than electricity. Moreover, since the electricity system connects production, storage, transmission, distribution and consumption, and electricity flows wherever it can flow in view of the capacity of the grid, all investments in infrastructure assets forming part of the electricity system should be understood as necessary to integrate renewable energy. This includes almost all electricity grid infrastructure, but also energy storage assets that serve to provide flexibility to the system, enabling it to incorporate more renewable energy. The scope of Article 15e should, however, not be understood to cover also dedicated infrastructure aiming to integrate non-renewable generation capacity.

In addition, a distinction should be made between grid and storage projects necessary to integrate renewable energy into the electricity system, which fall under the scope of Article 15e, and the ‘related infrastructure’, ‘co-located storage’ or ‘assets necessary for the connection of renewable plants and storage to the grid’ which are strictly connected with the production facilities, and which are referenced in other provisions of the revised RED, on the other hand. The notion of ‘related infrastructure’, ‘co-located storage’ or ‘assets necessary for the connection of renewable plants and storage to the grid’ should capture energy infrastructure directly related to the renewable energy projects, including all infrastructure necessary for the connection of renewable energy installations to the existing grid, but also, all reinforcements and extensions, including as regards digitalization and modernisation, of the existing grid enabling the energy produced by the renewable energy installations to be transmitted to consumers ⁽¹¹⁾. This should cover most of the necessary investments into distribution grids,

⁹ This would include: low, medium, high and extra-high voltage overhead, underground and submarine electricity cables; any equipment or installation, digital systems and components integrating information and communication technologies (ICT), through operational digital platforms, control systems and sensor technologies both at transmission and distribution level, aiming to ensure a more efficient and intelligent electricity transmission and distribution network; and any equipment or installation essential for the electricity systems to operate safely, securely and efficiently, including protection, monitoring and control systems at all voltage levels and substations.

⁽¹⁰⁾ Article 2(59) of Directive (EU) 2019/944, as amended by Directive (EU) 2024/1711 of the European Parliament and of the Council of 13 June 2024 amending Directives (EU) 2018/2001 and (EU) 2019/944 as regards improving the Union’s electricity market design OJ L, 2024/1711, defines ‘energy storage’ as ‘in the electricity system, deferring the final use of electricity to a moment later than when it was generated, or the conversion of electrical energy into a form of energy which can be stored, the storing of such energy, and the subsequent reconversion of such energy into electrical energy or use as another energy carrier.’ Only energy storage that reconverts the energy stored into electrical energy can be considered as falling within the scope of Article 15e of the revised RED, Storage infrastructure assets in this framework would include: electricity storage facilities, in individual or aggregated form, used for storing energy on a permanent or temporary basis in above ground or underground assets (as batteries) or geological sites, provided they are connected to transmission or distribution lines, and any equipment or installation essential for the safe, secure and efficient operation of the storage facility, including protection, monitoring and control systems at all voltage levels and substations.

⁽¹¹⁾ The scope of these notions was addressed in detail in the Commission’s Recommendation and guidance on speeding up permit-granting for renewable energy and related infrastructure projects:

- Commission Recommendation (EU) 2024/1343 of 13 May 2024 on speeding up permit-granting procedures for renewable energy and related infrastructure projects C/2024/2660 OJ L, 2024/1343
- Commission Staff Working Document SWD (2024) 124 final of 13 May 2024 Guidance to Member States on good practices to speed up permit-granting procedures for renewable energy and related infrastructure projects. Accompanying the document Commission Recommendation on speeding up permit-granting procedures for

without excluding necessary investments in transmission grids. In this respect, a significant amount of new network developments and reinforcements could already benefit from streamlined permitting procedures, where located in a renewables' acceleration area. The dedicated infrastructure areas under Article 15e cover electricity grids that are not directly related to renewable installations, but are part of the overall electricity system, since the entire electricity system functions in a connected manner, and the integration of renewable energy requires investments linked to the connection, transportation, and consumption of the renewable energy, as well as, to flexibility assets. Therefore, if there is a need to increase the integration of renewable energy in a certain Member State, most elements in the system are, de facto, essential for such purpose, and the dedicated infrastructure areas under Article 15e could cover all types of investments linked to the adequate functioning, strengthening or extension of the electricity system. Additionally, regarding storage assets, the scope of article 15e covers storage assets that 'are necessary to integrate renewable energy into the electricity system', but that are not co-located with renewables installations, i.e. storage facilities that are not combined with a facility producing renewable energy and are not connected to the same grid access point.

So-called stand-alone energy storage installations which alternatively draw and inject electricity from and to the grid are, a key asset to further integrate renewable energy into the electricity system and ensure that the system benefits from the full potential of renewable generation at all times. Although, in theory, the storage installation could draw electricity at times of high fossil generation, the electricity markets create strong incentives for storage installations to function in a way that maximises renewable integration, since prices are the lowest when renewable generation rises and are the highest when fossil generation dominates the mix.

Behind-the-meter electricity storage installations that share a connection point with an electricity consumer, be it a building or an industry, can also play a role in supporting the integration of renewable energy, depending on the specific circumstances. This is clear for storage assets connected to behind-the-meter renewable energy generation installations. But even storage assets that are not connected to a renewable generation installation, can contribute to renewables integration. For example, with behind-the-meter energy storage, industrial consumers can shift consumption to hours of high renewable generation and low prices, thus contributing to the integration of renewable energy.

'Environmental assessments' in this document should be understood as a general term addressing all assessments that may be required by national environmental authorities for issuing the permits and authorisations necessary for project development, including but not limited to:

- environmental impact assessments (EIA) detailed in the EIA Directive ⁽¹²⁾;
- strategic environmental assessment (SEA) detailed in the SEA Directive ⁽¹³⁾;
- Assessment under the Water Framework Directive to determine if the project is likely to deteriorate the status of a water body¹⁴; and

renewable energy and related infrastructure projects C(2024) 2660 final - SWD(2024) 333 final
https://energy.ec.europa.eu/publications/recommendation-and-guidance-speeding-permit-granting-renewable-energy-and-related-infrastructure_en

⁽¹²⁾ Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment OJ L 26, p. 1–21. (hereinafter referred to as EIA Directive)

⁽¹³⁾ Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, OJ L 197, p. 30–37. (hereinafter referred to as SEA Directive)

¹⁴ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, p. 1–73

- appropriate assessments (AA) detailed in the Habitats Directive ⁽¹⁵⁾.

Article 15e of the revised RED refers to the entities implementing grid and storage projects as ‘the operator’. Since the operator may, in certain instances be different from the developer of the grid or storage project, i.e. the entity in charge of the permitting and development of the project, this guidance will use the term ‘project promoter’ to refer to, any entity in charge of either the development and/or the operation of a grid or storage project.

3. Exemptions for grids and storage projects

In the case that dedicated infrastructure areas are set-up in line with the conditions of 15e(1), under Article 15e(2) Member States may exempt grid and storage projects necessary to integrate renewable energy that are located in such dedicated infrastructure areas from:

- EIAs required under Article 2(1) of the EIA Directive for grid and storage projects,
- AAs of their implications for Natura 2000 sites pursuant to Article 6(3) of the Habitats Directive, and
- the assessment of their implications on species protection pursuant to Article 12(1) of the Habitats Directive and to Article 5 of the Birds Directive ⁽¹⁶⁾, if such assessments are required under nation law to fulfil the obligations under the abovementioned Articles.

Member States may grant these exemptions when justified, including by the need to accelerate the deployment and integration of renewable energy to achieve the climate and renewable energy targets and by demonstrating that the projects clearly fall under the derogations set in Article 15e(2). Due to the way the electricity system functions in a connected manner, these exemptions could, de facto, cover a large variety of projects in these areas linked to the development, extension or improvements of transmission and distribution electricity grids, and storage solutions. In any event, Member States are expected to motivate the exemptions granted.

Nevertheless, these exemptions cannot be used when projects are likely to have significant effects (see point 5) on the environment in another Member State or where a Member State likely to be significantly affected requests their non-application, as provided for in Article 7 of Directive 2011/92/EU. Moreover, the finding of likely significant effects on the environment in another Member State is not linked to the cross-border nature of a project or with the significant cross-border impacts from an energy policy perspective, such as in the case of projects of common interest or projects of mutual interest selected pursuant to Regulation (EU) 2022/869. Only the likely significant effects on the environment, but not as regards other EU policies, are taken into account in the assessment of whether the exemptions provided by Article 15e(2) of the revised RED apply. Member States should assess whether infrastructure developments, including cross-border projects, could be designed in such a way as to avoid likely significant effects on the environment in another Member State.

It is to be noted that for grid and storage infrastructure financed with Cohesion policy funds, the location of such infrastructure in a dedicated infrastructure area does not exempt it from the obligations stemming out of Regulation (EU) 2021/1060¹⁷ notably regarding the Do No

⁽¹⁵⁾ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora OJ L 206, p. 7–50. (hereinafter referred to as Habitats Directive)

⁽¹⁶⁾ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Codified version) OJ L 20, 26/01/2010, p. 7–25, <http://data.europa.eu/eli/dir/2009/147/2019-06-26>.

¹⁷ Common Provisions Regulation

Significant Harm principle as provided by Article 9.4 thereof and the climate proofing of infrastructure as provided by Article 73.2(j) thereof.

4. Identification of dedicated infrastructure areas

Dedicated infrastructure areas should be understood as geographical areas, perimeters or corridors, within which grid infrastructure and storage assets necessary to integrate renewable energy into the electricity system can be developed and where it is not expected that this development would lead to significant environmental impacts. Dedicated infrastructure areas could also include areas where significant environmental impacts can be duly mitigated, or if this is not possible such impacts are compensated for within the framework of Article 15(e).

The interplay between avoidance, mitigation and compensatory measures means that, in practice, there are few restrictions as regards the Member States' territory that can be designated as dedicated infrastructure areas in line with the conditions set in Article 15(e), i.e. as long as the Member States identify appropriate mitigation and, if mitigation is not possible, compensatory measures within the framework of that provision, and they ensure synergies with the designation of renewable acceleration areas. As regards grids projects, the dedicated infrastructure areas must avoid Natura 2000 sites and areas designated under national protection schemes for nature and biodiversity conservation, unless there are no proportionate alternatives for their deployment, taking into account the objectives of the site, whereas as regards storage projects, Natura 2000 sites and areas designated under national protection schemes must be excluded. This regards an absolute exclusion of these areas in the case of storage assets and a reversible one in case of grid projects, as explained further below. Dedicated infrastructure areas do not have to be continuous or linked and could be designated in different regions of the territory of the respective Member State, for example in the case of cross-border infrastructure where applicable.

In line with Article 15e(1), designating these areas requires that:

- plans designating the areas are subject to a SEA and, when likely to impact a Natura 2000 area⁽¹⁸⁾, an AA; and
- plans designating the areas set out appropriate and proportionate rules for the development of projects, including on proportionate mitigation measures, which ensure that the respective projects can be deployed while avoiding adverse effects on the environment or, where this is not possible, while significantly reducing them, and
- the relevant infrastructure system operators are consulted during the preparation of the plans.

The prioritisation of areas for energy infrastructure development should be guided by the strategic integration of renewable energy sources, electrification projects, practical needs, network development plans, environmental considerations, climate adaptation considerations for the future grid and storage projects, and the need to ensure synergies with the designation of renewables acceleration areas. Different processes that plan and map energy transport, storage, generation assets and transport and industry decarbonisation needs exist at the EU and national levels and should be taken into account⁽¹⁹⁾. A close alignment between these existing

⁽¹⁸⁾ In the case of grid projects, since article 15e of the revised RED excludes Natura 2000 areas for storage projects.

⁽¹⁹⁾ Renewable Acceleration Areas; National Energy and Climate Plans (NECPs); Non-Fossil Flexibility Needs Assessments; Network Development Plans (NDPs); Maritime Spatial Plans; Nature Restoration Plans; and Processes envisaged in Regulation (EU) 2024/1735 of the European Parliament and of the Council of 13 June 2024 on establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem and amending Regulation (EU) 2018/1724 OJ L, 2024/1735, 28.6.2024, ELI: <http://data.europa.eu/eli/reg/2024/1735/oj> (Net Zero Industry Act Regulation).

planning processes and the designation of dedicated infrastructure areas should always be ensured. Current practices on coordination of these processes with the designation of infrastructure areas vary across the EU.

In line with Article 15e(2), should the respective Member State have designated infrastructure areas under a different framework before 20 November 2023 (such as in line with Article 6 of the Council Regulation (EU) 2022/2577), and if plans for such areas have been subject to an environmental assessment pursuant to the SEA Directive, the exemptions in Article 15e(2) can also apply to projects located in those areas.. The respective Member State retains the right to designate additional or different dedicated grid and storage areas in line with the requirements of Article 15e.

Further, while storage assets enjoy a degree of flexibility in terms of location, grids have long routing paths with little to no flexibility as to their location. It is recommended that dedicated infrastructure areas are designated at national level in such a way that they avoid highly sensitive and valuable biodiversity areas including the Natura 2000 network and nationally designated protected areas. If, however, dedicated infrastructure areas do overlap with Natura 2000 areas or with areas designated under national protection schemes, the respective Member States may allow the development of grid infrastructure within the scope of Article 15e in those areas only provided that there are no proportionate alternatives.

When assessing proportionate alternatives, Member States should take into account the need to ensure the economic viability, the feasibility and the effective and accelerated implementation of the project with a view to ensuring that the additional generation capacity of renewable energy deployed can be promptly integrated into the energy system. In areas where grid expansion is an essential development of the electricity system in line with the national network planning, Member States may consider that projects do not have proportionate alternatives in view of the objectives of the site. If a Member State complies with the requirements of Article 15e(1) when designating the dedicated infrastructure areas, meaning that all relevant safeguards are in place, it will be able to argue that there are no proportionate alternatives to Natura 2000 sites or areas designated under national protection schemes in terms of the location for the development of grids. Member States could consider different options as regards to the assessment of whether proportionate alternatives exist, for example, for routings of certain lengths or for offshore projects, such as hybrid assets or infrastructure connecting renewable projects directly to shore, as the areas where such projects are developed have already been identified and subject to a SEA in the context of national maritime spatial plans.

In case the appropriate assessments under Article 6(3) of the Habitats Directive of a plan designating dedicated infrastructure areas for grids concludes that the plan has a significant negative impact on Natura 2000 sites, the plan may be approved pursuant to Article 6(4) of the Directive if conditions therein are fulfilled. This means that if there are no alternative solutions, and if the plan must be carried out for imperative reasons of overriding public interest²⁰, compensatory measures have to be taken to ensure that the overall coherence of the Natura

²⁰ Under Article 16f of Directive (EU) 2023/2413, the planning, construction and operation of renewable energy plants, the connection of such plants to the grid, the related grid itself, and storage assets are presumed as being in the overriding public interest and serving public health and safety until climate neutrality is achieved. Moreover, in line with Article 7(8) of the TEN-E Regulation, projects of common interest and projects of mutual interest may be considered as having overriding public interest with regards to the environmental impacts addressed in Article 6(4) of the Habitats Directive provided all the conditions therein are fulfilled.

2000 network is protected. The Commission has published extensive guidance on the application of Article 6(3) and (4) of the Habitats Directive²¹.

Member States should strive to identify priority areas that enable the necessary strengthening and expanding of the network at the lowest cost from an economic, environmental, and societal point of view and prioritize these for the set-up of dedicated infrastructure areas. This includes assessing the impact on climate resilience²². After being adopted, the dedicated infrastructure area plans need to be regularly updated to accommodate changes and align with updates in the elements relevant for the elaboration of the plans, such as updates of network plans or in other plans or programmes used for the designation of the areas.

4.1. Network development plans

The interaction between these infrastructure areas and network development plans²³ (NDPs) is central to the identification process. Article 15e(1) requires that Member States consult transmission and distribution system operators when they prepare a plan to designate dedicated infrastructure areas.

In practice, it might be expedient for the plans developed by system operators to be at the basis of the designation of the areas; nevertheless, if the designation process coincides with the development of a new NDP, it could also precede and shape the development of the new plans, in coordination with the system operators.

At the transmission level, NDPs should indicate the development of main transmission infrastructure, including interconnectors, over the next 10 years, and should detail the investments planned for the next three years. The plans should be well aligned with the national energy and climate plan, hence reflecting future developments in generation and load, as well as development of storage, demand response and other alternatives to grid development. At the distribution level, NDPs should set out the planned grid-related investments for the next 5-to-10 years, with particular emphasis on the main distribution infrastructure that is required to connect new generation capacity and new loads, including recharging points for electric vehicles, as well as ports and airports which will move more and more towards electrification. It should also provide transparency on the medium and long-term flexibility services needed and consider alternatives to grid development (such as flexibility, including storage and demand response, or innovative grid technologies).

Recharging infrastructure (for electric vehicles but also in ports and airports) plays a specific role among the new loads that NDPs must take into account. As underlined in the Industrial Action Plan for the European automotive sector⁽²⁴⁾, the roll-out of recharging infrastructure is a precondition for the uptake of zero-emission vehicles and key for the competitiveness of

²¹ Guidance on “[Managing Natura 2000 sites - Publications Office of the EU](#)”; Guidance on “[Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6\(3\) and \(4\) of the Habitats Directive 92/43/EEC](#)”; Guidance on “[Energy transmission infrastructure and EU nature policy](#)”.

²² When determining which areas to identify as priority areas, Member States should include a risk assessment of what the climate risks for the planned infrastructure and take into account which areas are more conducive to reduce the identified risks to acceptable levels. Commission Notice: Technical guidance on the climate proofing of infrastructure in the period 2021-2027, C(2021) 5430 final.

²³ As required for DSOs and TSOs in line with Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU (recast), OJ L 158, 14.6.2019, p. 125–199

⁽²⁴⁾ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on an Industrial Action Plan for the European automotive sector COM(2025) 95 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52025DC0095>.

Europe's automotive sector. In the coming years, bidirectional charging infrastructure will play a crucial role in boosting renewables integration. In some relevant facilities such as depots ⁽²⁵⁾, it will allow electric vehicles to store excess renewable electricity when production is high and feed it back to the grid when demand increases. The revised RED reflects the importance of bidirectional charging infrastructure through provisions on the system integration of renewable electricity included in Article 20a. Therefore, planned areas for the deployment of recharging infrastructure, and the grid infrastructure necessary for the deployment of such infrastructure should be duly reflected in the NDPs, and particularly considered when determining the grid and storage areas. This should include with priority sites for recharging pools for heavy duty vehicles as identified under the Clean Transport Corridor Initiative²⁶, which is a pilot initiative with Member States under the new Competitiveness Coordination Tool of the EU.

This interaction with the NDPs will ensure that grid infrastructure is built based on production and consumption needs and potential, supporting existing and future grid connections. Nevertheless, given the lengthy timelines for the development of grids it would also be important for the NDPs themselves to extend as much as possible beyond the 10 years horizon and plan infrastructure for much longer time horizons that should then be considered by Member States when designating grid and storage areas. In particular as regards offshore grids, Member States should consider at least the 2035-2040 time horizon.

Moreover, industrial areas pre-identified for increasing electrification in the coming years are also a priority as they are expected to generate substantial demand for renewable energy. Similarly, urban expansion areas present a high potential for integrated infrastructure solutions, due to the growing energy needs of densely populated regions.

For storage projects, the interaction with the NDPs is also central but less prescriptive. NDPs are not expected to define the precise locations where storage assets are to be connected but should contain critical information regarding grid congestion, which helps developers identify the best locations for storage assets. If storage assets are placed at the right locations, they can help alleviate grid congestions and represent an alternative to grid expansion.

Member States should also take into account local planning considerations such as existing zoning plans on land use, including regarding cultural heritage sites and urban planning, and network security requirements from a physical and digital perspective.

4.2. Cross-border cooperation for the designation of grid and storage areas for cross-border infrastructure

To complete the Energy Union, it is crucial to enable a rapid deployment of infrastructure addressing the EU's new cross-border electricity capacity needs. Therefore, as much as possible in line with Article 15e of the revised RED, Member States should work closely together to define grids and storage areas near their borders, that may fall under Article 15e to accelerate the roll-out of cross-border infrastructure. This should be possible for projects that are not likely to have significant effects on the environment in another Member State even if they are de facto crossing borders as described in Section 3.

In this context, Member States should cooperate, coordinate and align the area designation, relevant stakeholder consultations, but also the mitigation rulebook and possible compensatory measures applicable in case of significant environmental impacts in these areas that cannot be

⁽²⁵⁾ Bidirectional charging is more relevant for chargers at home, workplace and depots than fast charging points.

²⁶ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Industrial Action Plan for the European automotive sector; COM (2025)95 final.

avoided. It would be very important for project promoters of cross-border projects to deal only with aligned requirements as regards the development of their projects.

4.3. Flexibility needs assessments

Member States can combine the information derived from the network development plans as regards the optimal location for assets with the information derived from the ongoing process to assess the non-fossil flexibility needs of their electricity system. Based on the provisions of the Electricity Market Regulation, an EU-level methodology for these assessments is being adopted. On this basis, Member States will then proceed to assess the non-fossil flexibility needs of their electricity systems for 2030. These needs are understood, in particular, as needs to integrate renewable energy, the same objective for infrastructure areas under Article 15e. This needs assessment will provide an overall estimation of the amount of flexibility that needs to be available in a given Member State by 2030. This assessment will be used to adopt an indicative objective. Based on this assessment process, Member States are expected to obtain an estimation of (i) the storage capacity they would expect the electricity system to have by 2030, and (ii) the systems need for other sources of non-fossil flexibility. Although not all storage assets will be installed in dedicated infrastructure areas, this needs assessment process should inform the designation of these areas because it provides an estimation of the overall storage capacity required. In addition, the assessment will include locational aspects informed by the involvement of transmission and distribution system operators.

4.4. Environmental considerations

When alternative areas tackle the same network development needs and present comparable levels of viability (from an economic and system operation point of view), the area with the lower impact should be prioritised. In that sense, when identifying dedicated grid and storage areas, Member States are expected to assess the impacts likely to result from the development of grid and storage projects in the areas under consideration. Corridors with existing infrastructure, such as transmission lines or transportation routes, should be preferred from the outset. Expanding these takes precedence over creating new routes, as this will minimise environmental disruption and accelerate development timelines. Further, Member States should prioritise artificial and built areas, areas with ongoing economic activities such as transport or industry, or degraded land not usable for agriculture, as adverse effects on the environment in these areas are expected to be less significant than in others. Conclusions from previous environmental assessments or data covering the area, if available, should be taken into account.

As regards storage projects, Member States are expected to assess the specific role of pumped hydropower storage (PHS). From an energy shifting perspective, PHS already plays a key role in many Member States and a number of projects for building additional capacity are ongoing. Since PHS projects use the effect of gravity on water masses, they require very specific topographic conditions and are often making use of existing reservoirs. In other words, they can only be built in specific locations and have very specific environmental impacts that need to be assessed and carefully managed.

The coordinated planning of grids, storage and renewable generation capacities should favour a strategic and comprehensive approach that takes into consideration limitations arising from environmental protection, but also synergies, including those relating to nature protected areas or areas subject to restoration measures. To this end, strengthened cooperation between

competent authorities responsible for the permitting of grid and renewable generation assets is crucial to ensure maximum efficiency.

4.5. Integration of renewable energy sources

Priority should be given to areas close to renewables acceleration areas, areas with significant renewable energy potential, areas with strained grid capacity, and areas where the grid is congested creating bottlenecks in the delivery of renewable electricity to demand centres and holding back investments in the electrification, for instance of industry, . Grid and storage projects in these locations can maximise the integration of renewable energy into the grid, reducing curtailment and improving efficiency.

Input from commercial project developers and energy communities should be incorporated into the development of the plans to designate dedicated infrastructure and storage areas early. A dedicated platform or system should enable renewable energy developers to signal their grid connection needs during the project planning phase, potentially incorporating financial commitments and expedited permitting processes.

4.6. Link between renewables acceleration areas and areas for grid and storage infrastructure

Article 15e(1) states that the aim of the areas for grid and storage infrastructure is to support and complement the renewable acceleration areas. Specifically in Article 15(1) point (c) it is indicated that the plan for infrastructure areas must ensure synergies with the designation of renewables acceleration areas. As mentioned above, when identifying dedicated infrastructure areas Member States should take into account existing and planned renewables acceleration areas, as well as existing infrastructure.

As a minimum, the areas necessary for connecting renewables acceleration areas to the grid and for integrating them into the energy system should be designated as dedicated grid areas. They are particularly necessary if the renewable acceleration areas are not able to accommodate the construction of all grid equipment that is necessary to integrate the renewables acceleration areas.

Member States can designate the same area as a renewables' acceleration areas and a dedicated area for grid and storage infrastructure. However, the different requirements of both Article 15c and Article 15e must be met. A single national plan could address both areas but requires separate and specific sections focusing on infrastructure and renewables.

Article 15b obliges Member States to carry out a mapping of areas necessary for national contributions towards the overall Union renewable energy target for 2030 exercise by 21 May 2025. In accordance with Article 15b(2)(c), Member States must consider for the mapping, among other things, 'the availability of relevant energy infrastructure, including grids, storage and other flexibility tools or the potential to create or upgrade such grid infrastructure and storage'. Therefore, plans for dedicated infrastructure areas developed in line with Article 15e, should, ideally, be based on the mapping exercise according to Article 15b(2) of the revised RED, instead of a stand-alone action.

If it is not possible to designate dedicated grid and storage areas simultaneously with as the designation of renewables acceleration areas, they should be subsequently identified in a manner that ensures that sufficient grid capacity is available to connect and integrate the new renewable power plants and their related infrastructure.

4.7. Public participation

Public participation plays a crucial role in the approval processes for energy infrastructure projects, as it can influence both their pace and outcomes, in particular, by addressing opposition that could lead to administrative and legal challenges. The SEA required for the adoption of plans designating areas for grid and storage infrastructure ⁽²⁷⁾, implies that a public consultation takes place as part of the designation process. By organising early public engagement activities, ensuring transparency in the mapping, and carrying out inclusive public consultations identifying possible impacts on local communities early on, Member States can foster public acceptance of grids and storage projects.

A key instrument available to Member States to facilitate public participation in grids and storage deployment, is the European Pact for Engagement and its guiding principle²⁸s. The pact calls for early, regular and meaningful engagement of public stakeholders and the need for adequate regulatory support. By signing the pact and adhering to its principles, the relevant authorities can ensure that the public participation activities as part of the designation of dedicated infrastructure area are conducted in a way that eliminates or mitigates public opposition.

French planning example

The French process for designating renewable acceleration areas offers relevant good practices. The process includes the identification of relevant zones for the renewable acceleration areas and strategic evaluation and consultation with system operators.

After a public consultation local authorities identify the areas and inform the concerned authorities, including the energy regulator. With the involvement of distribution system operators (DSOs), the transmission system operator (TSO) draws up the S3REnR plan ⁽²⁹⁾, which optimises the development, use, and cost of infrastructure needed for renewable energy connections while ensuring the safety of the system. This includes assessing the renewable development potential at national and regional level and determines the network connection capacity needed across the area to accommodate the development of the generation assets.

DSOs chart the territory to determine whether a grid connection is located in a sensitive environmental area. Before grid development works start, public consultations are organised involving local governments, elected representatives, non-governmental organisations, and local populations.

German planning example

The regulatory authority, BNetzA, identifies preferential and reservation areas, which are categorized as ‘priority areas’ and ‘reservation areas for energy transmission lines’ in the German Regional Planning Act. The planning approval authority determines infrastructure areas where project specific environmental impact and species protection assessments are not mandatory. A review process is conducted to mitigate or compensate unforeseen adverse

⁽²⁷⁾ Application of Article 6 of the SEA Directive by requirement of Article 15e(1) of the revised RED.

²⁸https://energy.ec.europa.eu/document/download/65ffb0ca-928e-4746-adac-74c8f918c7f3_en?filename=Pact%20for%20Engagement%202023.pdf

⁽²⁹⁾ I.e. ‘Stratégie de Sécurité et de Rénovation de la Réseaux d’Energie’.

effects. BNetzA uses a geographic information system for a software-based resistance-distance analysis to identify strips of land with advantageous links between the start and end points, taking into account spatial and construction resistances and length.

The regional planning office determines how land is used and ensures that energy infrastructure is integrated into spatial planning. Local zoning laws allow municipalities to allocate land for specific purposes, including energy infrastructure. Local authorities are required to account for energy infrastructure needs in their planning. The Federal Energy Industry Act outlines the need for energy infrastructure, including electricity grids and storage facilities to support the energy transition and the Federal Grid Development Plan identifies critical areas for grid development. Environmental considerations and protection areas are taken into account. Further, the German Offshore Wind Energy Act sets out a clear framework for designating areas suitable for offshore wind energy infrastructure, including areas for generation, grid connections, and related network infrastructure.

The Federal Institute for Research on Building, Urban Affairs and Spatial Development maintains a nationwide Spatial Development Plan. It records specifications of state and regional planning.

4.8. Offshore planning

In line with Directive 2014/89/EU ⁽³⁰⁾, Member States are required to organise their maritime spatial planning based on relevant existing and future activities and uses in their marine waters. To do so, Member States draw up their maritime spatial plans (MSPs).

When drawing up the MSPs, Member States facilitate the use of maritime space for various purposes, including renewable energy generation.⁽³¹⁾ The designation of areas for different purposes is accompanied by a strategic environmental assessment in line with the SEA Directive. Further, to avoid duplication and additional administrative burden, the revised RED encourages Member States to use or build upon their workstream and their existing spatial planning documents and plans for drawing up MSPs when mapping areas with renewable energy production potential and when mapping areas required to meet at least their national contribution to the EU 2030 renewable energy target ⁽³²⁾.

Directive 2014/89/EU clearly identifies ‘installations and infrastructures for the production of energy from renewable sources’ as activities and uses that Member States may include in their MSPs. While the infrastructure needed for the transport of this energy onshore is not separately mentioned among the relevant considerations, it should be considered as part of the infrastructures referred to in the Directive. Considering the role of the dedicated infrastructure areas to integrate renewable energy in the electricity grid and complement the renewable acceleration areas, Member States should consider the infrastructure for the transport of renewable energy as a possible use in their MSPs, in the same way as ‘submarine cable and pipeline routes’ that are explicitly referred to in the Directive ⁽³³⁾. As a result, the work done to draw up the MSPs can be relied upon when designating dedicated infrastructure areas offshore.

⁽³⁰⁾ Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning, OJ L 257, 28.8.2014, p. 135–145. (hereinafter referred to as Directive 2014/89/EU)

⁽³¹⁾ Directive 2014/89/EU Article 8(2), 3rd subparagraph.

⁽³²⁾ Revised RED, Article 15b.

⁽³³⁾ Directive 2014/89/EU, Article 8(2), 9th subparagraph.

Member States are encouraged to strengthen cross-border cooperation in maritime spatial planning at sea basin level, to cooperate closely on offshore grid planning within regional organisations and in coordination with Offshore Network Development Plans.

The case of offshore planning needs special attention, since, in most cases, the developed renewable generation and infrastructure projects have characteristics that cannot be replaced by a different configuration of the projects or a different project in view of the costs and expected socio-economic benefits. Therefore, in those cases, when assessing the existence of proportionate alternatives for offshore projects such as hybrid assets ⁽³⁴⁾ or infrastructure connecting renewable projects directly to shore, Member States should consider the areas identified in the MSPs, as those plans identifying such areas have already been subject to an SEA when drawing up the MSP.

In addition, as regards the set-up of offshore dedicated areas, Member States should consider the use of the European Marine Observation and Data Network³⁵, which is a go-to service for the EU Blue economy and planning of new offshore installations.

Some Member States already present good practices as regards the coordination between processes for identification of specific areas for offshore developments:

Lithuania's maritime planning

Lithuania designates maritime areas for the deployment of offshore renewable energy. Its MSP was developed as a part of the National Comprehensive Plan, including a section on 'Maritime territories' which complements the terrestrial spatial plan. The plan is based on a study identifying priority areas for offshore wind development. The maritime areas were selected based on technological (i.e., installed capacity, plant layout, power density), territorial (i.e., rational use of the site, depth/terrain, distance from coast/ports, feasibility of the zones, wind speed) and infrastructure criteria (i.e. initial Harmony Link route, location of the offshore substation). In these areas, offshore wind farms can be developed and operated in phases, reserving corridors for infrastructure and naval traffic. The project was supported with funding from the European Commission under the Recovery and Resilience Plan.

4.9. Using digital tools to support implementation

Given the scarcity of space and the possible adverse effects of grid infrastructure, Member States should use of digital spatial planning tools like: permitting and connection request tools, tools managing renewables tenders, and capacity heatmaps for generation, transmission and distribution. Environmental sensitivity mapping tools and portals holding environmental data that identify regions that require special environmental consideration should also be used. For example, Member States could use the Natura 2000 viewer showcasing the geographic location of Natura 2000 sites and the specific site information ⁽³⁶⁾. In addition, setting up portals with digitalized environmental data could streamline the mapping and screening of the territory. For example, in Denmark, the Danish Environmental Portal owned by the national government, regions, and municipalities ⁽³⁷⁾ provides access to comprehensive, interoperable environmental data for registered users. The portal is structured around 'subject groups' covering water, nature, environmental assessments, and other areas, focusing on 'ecosystem-based analysis'

⁽³⁴⁾ Generation connected directly to interconnectors and serving a double purpose.

³⁵ <https://emodnet.ec.europa.eu/en/emodnet-blue-economy>

⁽³⁶⁾ EEA, The Natura 200 viewer: <https://natura2000.eea.europa.eu/>.

⁽³⁷⁾ ARTER, knowledge base website: <https://om.arter.dk/https://om.arter.dk/>.

for cumulative effects. Data is tied to locations, allowing users to mark specific areas and get an overview of all environmental data in the chosen area. For EIAs, the portal provides a baseline for projects data to be shared, and additional data produced for the EIA is shared with the portal to feed into the next assessments. The portal has developed several tools to help project promoters in the EIA process, including a screening tool using Artificial Intelligence to search previous EIAs, and an ‘EA hub’ to search for data on conflicts in specific locations. The tools include ‘EA tools’ which compile data for EIA process (currently only available for onshore projects) and allow users to define regions on maps to investigate available data and potential impacts.

Best use should be made also of existing GIS maps, databases, and other geological data portals that combine environmental and other restrictions with information on infrastructure requirements, capacity and/or areas with the highest renewable energy potential and demand. For example, the Commission’s Joint Research Centre’s Energy and Industry Geography Lab’s online tool ⁽³⁸⁾ integrates sensitive areas and data on existing and planned electricity grid, renewables and storage infrastructure. The Energy Atlas provides insights about demand centres ⁽³⁹⁾.

Digital tools facilitating information sharing with authorisation bodies and stakeholders as well as digital tools used to identify available energy infrastructure and comply with the mapping obligation stemming from Article 15b of the revised RED should also be used as much as possible.

Italy - TE.R.R.A.

The Italian Transmission System Operator, Terna, implemented a tool to facilitate territorial and environmental planning and ensure a more efficient infrastructure programming. The TE.R.R.A. portal disseminates information related to grid development, connection requests, renewable energy sources, storage, and consumption facilities (including through monitoring reports on the status of connection procedures, geolocated visualizations and mapping of environmental and territorial constraints). The portal can be accessed by institutions and interested economic operators improving programming and coordination between Terna and authorisation bodies. Moreover, Italy applies the micro-zoning principle, which divides current market zones into smaller areas to facilitate coordinated planning of connection requests and grid improvements. This model enables the quantification of additional renewables capacity that can be integrated given the expected grid developments.

Portugal

In Portugal, LNEG, the national energy and geology laboratory ⁽⁴⁰⁾, supported with funding from the European Commission under the Recovery and Resilience Plan, evaluated which areas of (mainland) Portugal have less environmental and heritage sensitivity to develop renewable energy power plants and developed an application that enables users to view maps and spatial information ⁽⁴¹⁾. This constitutes a repository that centralises LNEG’s georeferenced information in the energy and geology areas. Through the identification of the least sensitive areas from an environmental and heritage point of view, it became clear which areas are suitable for a simplified permitting process for solar and wind generation assets,

⁽³⁸⁾ Joint Research Centre - European Commission (JRC), Energy and Industry Geography Lab (EIGL) – Mapping Europe’s Energy Future: <https://energy-industry-geolab.jrc.ec.europa.eu/>.

⁽³⁹⁾ Joint Research Centre - European Commission (JRC), Energy and Industry Geography Lab (EIGL) – Energy Atlas, 22 April 2024: <https://energy-industry-geolab.jrc.ec.europa.eu/energy-atlas/>.

⁽⁴⁰⁾ Laboratório Nacional de Energia e Geologia: <https://www.lneg.pt/>.

⁽⁴¹⁾ Laboratório Nacional de Energia e Geologia, GEOPORTAL: <https://geoportal.lneg.pt/>.

making it possible to accelerate their implementation without compromising environmental and territorial values. The resulting areas are candidates for simplified permitting processes.

5. Assessing the existence of significant environmental impacts

Article 15e requires Member States to assess the potential significant environmental impacts when designating the dedicated areas. They must lay down appropriate and proportionate requirements for promoters to follow, in order to avoid or significantly reduce, adverse effects on the environment that may arise, for example through a mitigation rulebook. A screening process is also to be set up to ensure that in case that is highly likely for a project to create unforeseen significant adverse effects, this is detected and that the effects can be subsequently avoided, mitigated or, when mitigation is not possible, compensated for.

While the information this section is not specific to the identification of dedicated infrastructure and storage areas, it aims to guide Member States in conducting the relevant assessments and in laying down appropriate and proportionate requirements.

The potential impacts of grid and storage projects will vary depending on whether the project consists of a new asset or, reinforcement or substitution of existing assets. The impact of works necessary to modernise existing projects (it is estimated that more than 40% of European grids require modernisation ⁽⁴²⁾) could be considered of a temporary nature.

At the stage of the plans' preparation for the designation of the dedicated infrastructure areas, potential significant environmental impacts are assessed by considering the characteristics of existing and planned projects, their location, the geographical areas likely to be affected by them, and the characteristics of the potential impacts ⁽⁴³⁾. This determination of potential significant environmental impacts is fundamental to determine which areas do not have them and, for areas having them, to verify whether those impacts can be avoided, mitigated or, when not possible, compensated for. This assessment also helps authorities to identify the appropriate avoidance, mitigation or compensatory measures to be implemented in the area by the project promoters.

Significant environmental impacts associated with grid and storage projects may vary across the different lifetime phases: construction, maintenance, operation and decommissioning.

Typical environmental impact of grids and storage projects

- The construction phase may generate impacts such as: noise pollution, habitat disruption and fragmentation, light pollution, soil erosion or degradation, water pollution, and changes to food webs.
- The operation phase may generate impacts such as: noise pollution, electromagnetic interference, light pollution, soil erosion and degradation, bird, bat and other mammal strikes and electrocution, disruption of migration patterns (of birds, fish, mammal and insects), changes to food webs, and habitat disruption due to changes in flow regime.

⁽⁴²⁾ EU Action Plan for Grids, p. 1-2.

⁽⁴³⁾ EIA Directive, Annex III

To address significant environmental impacts of infrastructure, best practices and nature-positive measures, such as nature-based solutions, should be further promoted, and robust data collection and assessment processes should be in place.

Belgium integrated vegetation management

The Belgian Transmission System Operator, Elia, cooperates with the ecological and forestry engineering cooperative Ecofirst to monitor developments in the Belgian ecological corridors. This monitoring is conducted according to scientific standards relying on surveys of several taxonomic groups of fauna and flora with experts' opinions on the progress, diversity and structure of vegetation included in the report. This monitoring process takes place once per season and includes extensive site monitoring by ecologists during the high periods, regular photographic documentation and classifications of habitats. Elia also applies targets on bird diverters.

5.1. Cooperation and support tools to identify significant environmental impacts

To assess the potential significant environmental impacts, competent environmental and permitting authorities (at national, regional and local level) should be involved in the process from the start, so that the most precise information is integrated into the environmental permitting procedures. Appropriate tools, datasets and existing assessments should be used to identify areas where the deployment of grids and storage will not have significant environmental impacts. The Danish Environmental Portal, mentioned above, is a good example of cooperation amongst competent authorities using adequate tools. Moreover, it would be important for Member States to also cooperate cross-border with authorities in neighbouring Member States to ensure an alignment of approaches and requirements across-borders and facilitate, thus, the development of cross-border grid projects as much as possible.

5.2. Mitigation rulebook

Under Article 15e(1) point (e), Member States should lay down appropriate and proportionate rules to be part of the plans designating dedicated grid and storage infrastructure areas, in order to avoid or minimise adverse effects on the environment. This includes avoidance and, if not possible, mitigation measures and conditions. In line with Article 15e(1), if expected significant environmental impacts are not possible to be duly mitigated, such impact has to be compensated for (see Section 5.3 below on compensatory measures).

In consequence, Member States may draw up a mitigation rulebook for each dedicated grid and storage area, identifying tailored measures to address potential significant impacts expected to arise from implementing the plan ⁽⁴⁴⁾. Member States may rely on potential significant impacts identified in the SEA, and previous EIAs and AAs for projects in the area. When referring to measures that address the significant impact of projects in dedicated infrastructure areas, these should aim to avoid the identified impacts, or, when that is not possible, significantly reduce them ⁽⁴⁵⁾. Member States could also use the mitigation measures library for impacts on water bodies⁴⁶.

5.2.1. Mitigation measures

During the drafting of the rulebook, different measures could be considered to avoid or mitigate identified adverse effects on the environment that may arise, among other things: (i) using alternative routes that avoid ecologically sensitive areas and limit habitat fragmentation, (ii) burying cables where there is an increased wildlife collision risk (ideally along roads and other existing linear developed ground), or (iii) applying cable trenching or other innovative solutions in given areas.

Examples of approaches to mitigation measures at the planning stage:

1. **Stakeholder engagement:** Engaging with stakeholders, including local communities, indigenous peoples, and environmental organisations.
2. **Monitoring and reporting:** Monitoring of and reporting on environmental impacts and mitigation effectiveness.
3. **Adaptive management:** Adopting adaptive management strategies to respond to changing environmental conditions or unexpected impacts.

Member States could also impose conditions on developments in areas where grids and storage are necessary but have a significant impact on the environment.

Examples of design and construction requirements:

1. **Tower and pole design:** Designing towers to minimise bird strikes, electrocution, and visibility impacts.

⁽⁴⁴⁾ The principle of the mitigation rulebook as set out in the Renewable Energy Directive and of the measures referred to in Annex I paragraph (g) to the SEA Directive.

⁽⁴⁵⁾ Avoidance measures refer to the actions taken to prevent or avoid environmental harm or impacts altogether by changing the way a project or activity is carried out, e.g. requiring that grid infrastructure in a certain area consists of buried lines to prevent collision risks. Mitigation measures refer to actions taken to reduce or minimize the adverse environmental impacts of a plan, project, activity, or development.

⁴⁶ <https://circabc.europa.eu/ui/group/9ab5926d-bed4-4322-9aa7-9964bbe8312d/library/ce665502-bea5-48a5-8408-6c33af2f4f95/details>

2. **Wire marking and bird flight diverters:** Installing visual markers or diverters to reduce bird collisions.
3. **Insulation of wires and electrical conductor elements:** Insulating the electrical wires and other parts of the infrastructure that represent an electrocution risk.
4. **Fencing and exclusion systems:** Installing fencing or exclusion systems to protect wildlife from energized infrastructure.
5. **Tunnelling and burying infrastructure:** Burying or tunnelling infrastructure to reduce habitat disruption and visibility impacts.
6. **Fire prevention.** For batteries, installing fire suppression technologies
7. **Water courses.** For hydro pumped storage, installing fish passages, sedimentation control systems, etc.

Member States could also impose conditions on the operation of assets in dedicated infrastructure areas to mitigate the adverse effects on the environment that may arise.

Examples of conditions for operation:

1. **Reduced lighting:** Reducing or eliminating lighting on energy infrastructure to minimise light pollution.
2. **Noise reduction:** Implementing noise reduction measures, such as noise barriers or sound-dampening materials.
3. **Electromagnetic field reduction:** Implementing measures to reduce electromagnetic field strength and minimize impacts on wildlife.
4. **Monitoring and maintenance plans:** Regularly monitoring and maintaining energy infrastructure to prevent wildlife collisions and electrocution.
5. **Advanced battery storage management systems:** Implementing technologies that extend the system's lifetime, and reduce likelihood of thermal runaway, fire hazards, and chemical leakage incidents.
6. **Recycling:** Introducing recycling obligations for end-of-life batteries.
7. **Hydro pumped storage:** Promoting habitat restoration initiatives and minimum flow maintenance.

5.3. Compensatory measures

In line with Article 15e(1), the revised RED prioritises mitigation measures for addressing significant environmental impacts. However, Member States designating dedicated infrastructure areas may also introduce compensatory measures for situations when the significant environmental impacts of dedicated grid and storage areas cannot be mitigated. The aim would be to compensate significant unforeseen adverse effects on the environment of a project that could not be avoided or mitigated.

Example of compensatory measure:

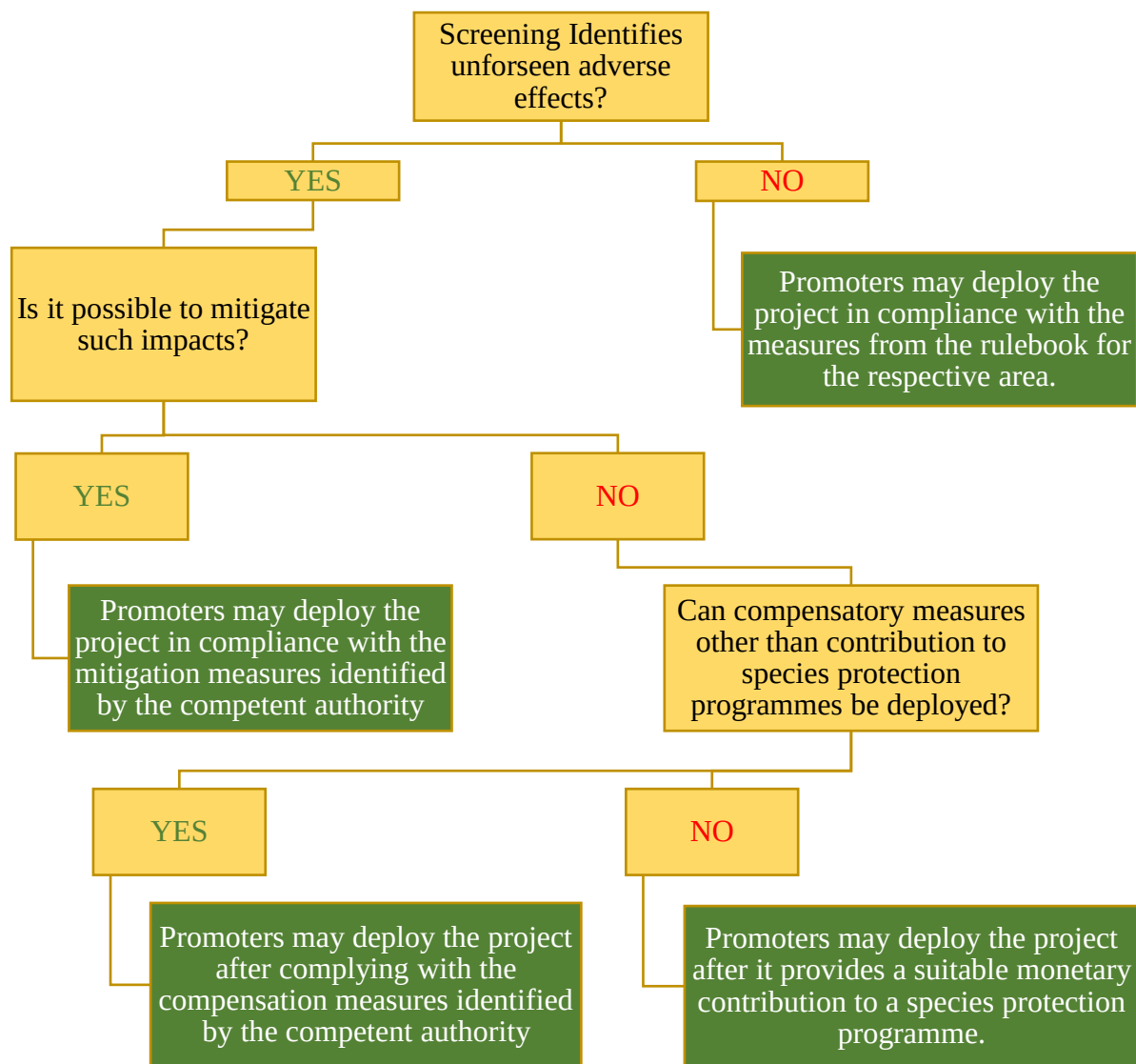
Compensatory habitat creation for affected species: Creating new habitats to compensate for losses caused by the deployment for grid or storage infrastructure.

5.4. Screening of projects in dedicated infrastructure areas

Where Member States aim to make use of the exemptions of Article 15e(2), the competent national authorities must carry out a screening of the projects to be deployed in dedicated infrastructure areas. The screening assesses whether a project is highly likely to give rise to significant unforeseen adverse effects that were not identified during the environmental assessment of the plans designating dedicated infrastructure areas, carried out pursuant to the SEA Directive and, where relevant, the Habitats Directive, or addressed in the relevant mitigation rulebook. When screening for environmental impacts related to infrastructure projects, the national competent authorities should take into account the criteria listed in Annex III to the EIA Directive ⁽⁴⁷⁾ and where relevant the Water Framework Directive.

This screening should not last more than 30 days and should be based on existing information from previous environmental assessments and any additional already available information the authority deems necessary for the promoter to produce. The screening process should not require the promoter to collect any new information that is not yet available.

⁽⁴⁷⁾ Characteristics of projects; Location of projects (i.e. geographical areas likely to be affected by projects); Characteristics of the potential impacts.



In line with Article 15e(5), for the screening and assessment process of a project aimed at reinforcing the existing grid infrastructure in dedicated infrastructure area, only the potential significant impact arising from the changes or extension compared to the original infrastructure needs to be taken into account. It should be mentioned that the provisions of Article 15e(5) are not limited to the dedicated grid and storage areas, or projects subject to the screening in line with Article 15e(3) and (4). This provision applies to all cases where the integration of renewable energy into the electricity system requires a project to reinforce the grid infrastructure (in or outside dedicated infrastructure areas). In fact, Article 15e(5) contains mandatory provisions for Member States requiring that in cases of projects reinforcing the grid, (i) screening process carried out pursuant Article 15e(3), (ii) the EIAs carried out in accordance to Article 4(1) of the EIA Directive and (iii) the determination, carried out in accordance with Article 4(2) of the EIA Directive, of whether an EIA is needed, must, all of them, be limited to the potential impact arising from the change or extension compared to the original grid infrastructures. In this sense, for projects to reinforce or replace grid infrastructure, the scope of these three procedures must be limited to changes or extensions that may give rise to significant impacts beyond the original project. When the screening process identifies a project as highly likely to give rise to significant unforeseen effects, the competent authority must ensure, only based on of existing data⁴⁸, that appropriate and proportional mitigation measures are applied. If it is not possible to apply mitigation measures for unforeseen adverse effects identified in the screening process, the competent authority must ensure that the promoter

⁴⁸ Either that the authority already holds or that is requested from the project promoter

adopts appropriate compensatory measures that address those effects. During the screening of projects, national competent authorities will be responsible for ensuring that the mitigation and compensatory measures proposed to be adopted by a project promoter are appropriate.

In order to ensure or improve the conservation status of the species affected, the authority may opt to require the establishment of compensatory measures or a monetary compensation for species protection programmes. For the latter, the competent authority should calculate the appropriate amount for the contribution. Since project promoters are not specialised in environmental matters, this last resort measure allows specialized environmental experts to ensure or improve conservation status of affected species in a location that is different from the location of the project and where the benefits of compensatory measures to the fauna and flora can be maximised. This also enables the projects to go ahead while the compensatory measures are being implemented, which is essential in view of the urgency to deploy energy infrastructure.

German environmental compensatory scheme

Infrastructure areas are determined by the planning approval authority. Environmental impact and species protection assessments are no longer mandatory for individual projects in these areas. Instead, the planning approval authority conducts a review to mitigate or compensate unforeseen adverse effects. When adequate mitigation measures cannot be identified, the competent authorities assess an appropriate contribution to be collected from project promoters to the nature protection fund or species support programmes for the preservation or improvement of corresponding populations. By doing so, the fund or programmes can be managed by environmental professionals and target an entire population rather than the individuals identified. Such an approach makes it possible to take action in locations where compensatory measures will bring more benefits and to set up a comprehensive monitoring of population development.