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# PERMITTING REFORM AND RENEWABLE ENERGY

One-Stop-Shop under  
the Revised RED





# FOREWORDS



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Director

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At the Energy Community Secretariat, we celebrate the unmistakable energy transition unfolding across the Energy Community. Rooted in the drive for energy market integration, this transition has reshaped the region's energy landscape, embedded decarbonisation targets and fostered competitive, market-based renewable energy deployment. Yet deployment still falls short of what the transition demands. Overly complex and fragmented permitting procedures across the region create delays and uncertainty for renewable energy developers. A competitive and thriving renewables market requires a robust legal and policy framework, fully embedded in a functioning regional energy market, and consistent and effective implementation in practice.

The revised Renewable Energy Directive EU/2023/2413 (revised RED) is designed to create such a stable and investment-friendly framework. It introduces a new paradigm through the mandatory designation of Renewables Acceleration Areas, designed to ensure that renewable energy projects can be developed efficiently while maintaining high environmental safeguards. Their effectiveness lies in the binding time limits, streamlined permit-granting procedures and clearer requirements for coordinated or single contact point mechanisms. Turning the revised RED into an operational reality in the Energy Community will require sustained institutional support to reform planning and permitting systems and technical implementation on the ground.

The Energy Community Secretariat is committed to providing this support. Through the Centre for Accelerating Renewables, we give hands-on technical assistance to establish one-stop-shops and designate Renewables Acceleration Areas, helping institutions clearly define responsibilities, establish predictable timelines and ultimately reduce approval periods for renewable energy projects.

The Protocol laid out in this book is another milestone in accelerating the practical delivery of renewable energy reform and will complement the work of the Centre. Developed in partnership with The Nature Conservancy, it provides a structured roadmap for establishing effective one-stop-shop mechanisms, clarifying administrative responsibilities, applying binding time limits and designing coordinated permitting workflows that ensure efficient and predictable decision-making. Together with the previously issued *Operational Blueprint for Designation of Renewables Acceleration Areas*, it forms a coherent framework to guide both strategic planning and practical permitting reform.

I invite all Contracting Parties and stakeholders to use this Protocol as a practical guide in implementing the revised RED. Implementation cannot wait. The strength of our integrated energy market – and the credibility of our transition – will be defined by reforms delivered.



## Marianne Kleiberg

Regional Managing  
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The energy transition is one of the defining challenges of our time. Achieving sustainable renewable energy deployment is crucial for meeting climate targets. At the same time, this transition must uphold and protect Europe's rich biodiversity and the natural systems on which all communities rely.

As Regional Managing Director for The Nature Conservancy in Europe, I firmly believe that renewable energy expansion and biodiversity protection are not competing objectives – they can be mutually reinforcing when supported by smart planning, transparency and inclusion.

The Protocol on permitting and one-stop-shops for renewable energy, developed in partnership with the Energy Community Secretariat, captures the current momentum for simplifying permitting procedures for renewable energy and underscores the need for coordinated, efficient and transparent administrative systems. A well-functioning one-stop-shop should enable accelerated permitting for renewable energy while ensuring that environmental considerations are fully integrated into early stages of decision-making and project planning. This is essential to avoid conflicts, reduce delays and safeguard natural and social values.

A good example of this integrated approach is The Nature Conservancy's smart siting methodology, which uses spatial analysis, ecosystem and social-value data to identify locations for wind and solar development that minimise negative socio-environmental impacts. This approach demonstrates how renewable energy targets can be met while respecting nature and local communities. The methodology has been applied globally, with its most recent projects launched in Montenegro and Portugal. Incorporating such smart siting principles into the work of one-stop-shops can strengthen their capacity to support decision-makers, developers and investors.

By aligning smart spatial planning with improved permitting coordination, we can create truly sustainable pathways toward a climate-neutral and nature-positive future.

I hope this Protocol serves as practical guidance and inspiration for competent authorities across regions to design one-stop-shops that are not only efficient but also environmentally conscious and inclusive of biodiversity values.

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# ABBREVIATIONS

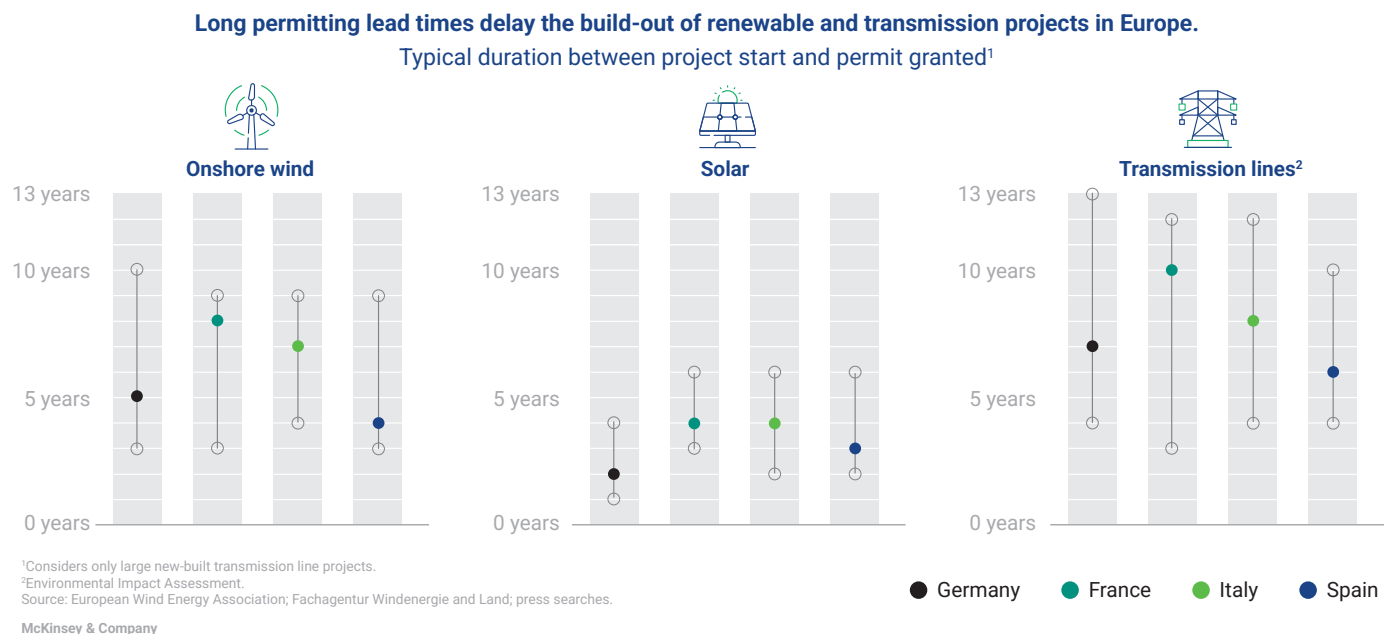
<b>ADR</b>	Alternative Dispute Resolution
<b>CP</b>	Energy Community Contracting Party
<b>DSO</b>	Distribution System Operator
<b>EIA</b>	Environmental Impact Assessment
<b>EIA Directive</b>	Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment with amendments introduced by Directive 2014/52/EU
<b>ECS</b>	Energy Community Secretariat
<b>EU</b>	European Union
<b>Habitat Directive</b>	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
<b>KPI</b>	Key Performance Indicator
<b>OSS</b>	One-Stop-Shop
<b>RAA</b>	Renewables Acceleration Area
<b>RE</b>	Renewable Energy
<b>RE OSS</b>	Renewable Energy One-Stop-Shop
<b>RED</b>	Renewable Energy Directive
<b>RED II</b>	Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources
<b>RES</b>	Renewable Energy Sources
<b>Revised RED</b>	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
<b>SEA</b>	Strategic Environmental Assessment
<b>SEA Directive</b>	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
<b>TEN-E Regulation</b>	Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on guidelines for trans-European energy infrastructure, amending Regulations (EC) No 715/2009, (EU) 2019/942 and (EU) 2019/943 and Directives 2009/73/EC and (EU) 2019/944, and repealing Regulation (EU) No 347/2013
<b>TSO</b>	Transmission System Operator

# INTRODUCTION

Developing renewable energy (RE) projects requires obtaining numerous permits. This involves coordination with multiple competent authorities, including those responsible for energy, environmental protection, planning and construction, as well as network operators and national regulatory authorities for energy. The study of the European Commission *Simplification of permission and administrative procedures for RES installations* (RES

Simplify) finds that lengthy and complex administrative procedures create substantial bottlenecks in RE development.<sup>1</sup> As illustrated in Figure 1, permitting in four EU Member States (Germany, France, Italy and Spain) can take three to 10 years for onshore wind and two to six years for solar.<sup>2</sup> The RES Simplify also flags that bottlenecks can be created if the authorities are understaffed or lack expertise.<sup>3</sup>

**Figure 1:** Typical duration between initiation of project and permit granted in four Member States



RES Simplify highlights that RE one-stop-shops (RE OSS) or single contact points<sup>4</sup> can effectively streamline RE permitting by simplifying administrative steps and improving transparency, as illustrated by Member State examples such as Denmark's integrated approach

for offshore wind. However, the study concludes that there is still considerable scope to strengthen RE OSS arrangements by expanding their coverage across the full permitting chain to cover elements like grid connection and, where relevant, production licensing.

1 [European Commission, Technical support for RES policy development and implementation – Simplification of permission and administrative procedures for RES installations \(RES Simplify\), Final report, page 86.](#)

2 [McKinsey & Company, Five key action areas to put Europe's energy transition on a more orderly path, August 2023.](#)

3 RES Simplify, page 87.

4 The terms "contact points", "one-stop-shop" and "single contact point" are used interchangeably in the EU policy and legal documents and the second chapter elaborates on this aspect.

Similarly, the Permitting study commissioned by the Energy Community Secretariat (ECS) finds that Energy Community Contracting Parties (CPs) face challenges that mirror those encountered in the EU; the procedures for connecting RE projects to the transmission grid in CPs can take up to seven years, starting from the submission of the connection application to the operator and ending with the project's final operation.<sup>5</sup> The Permitting study concludes that none of the CPs has yet established an RE OSS.<sup>6</sup>

The EU gained deeper insight into the barriers affecting permitting procedures across Member States through the RES Simplify study and began to address the permitting of RE projects more systematically in 2022 by adopting the Commission Recommendation<sup>7</sup> and the Guidance on speeding up renewable energy permitting.<sup>8</sup> As a response to the energy crisis, the Council also adopted the Regulation (EU) 2022/2577, which established temporary rules of an emergency nature to accelerate the permit-granting process.<sup>9</sup>

These policy documents recommend streamlining and better coordination of permitting responsibilities through efficient RE OSSs that limit the number of authorities involved and concentrate relevant expertise, such as by designating a single national or regional authority with clear mandates, defined lists of involved bodies, digitalised platforms and close alignment with grid and environmental permitting processes.<sup>10</sup>

In parallel with enacting these policy documents, the new provisions on streamlining permitting procedures were incorporated in the EU legislative framework for the development of RE projects in the revision of Renewable Energy Directive of 2023 (revised RED). Following up the revision of the directive, the European Commission updated the 2022 Recommendation in May 2024, adopting the Recommendation (EU) 2024/1343<sup>11</sup> and accompanying guidance to ensure their alignment with the revised RED.

This new acquis has already delivered tangible results in the EU. For example, the implementation of permitting reforms in Germany significantly reduced permitting times by one to three years. As a result, the number of new onshore wind project permits has more than tripled since 2022, installations increased by 48% in 2023 and around 3,300 km of transmission grids have been approved since Q2 2023.<sup>12</sup>

While Renewable Energy Directive (EU) 2018/2001 (RED II) has been a part of the Energy Community acquis since December 2021,<sup>13</sup> the revised RED has not yet been incorporated into the Energy Community acquis. In June 2024, the ECS adopted Policy guidelines<sup>14</sup> to accelerate RE deployment by simplifying permitting (including establishing RE OSSs and a maximum of 45 days for environmental impact assessment (EIA) screenings), designating renewables acceleration areas (RAAs) and strengthening transparent, participatory decision-making.

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- 5 [Energy Institute Hrvoje Požar's Permit-Granting and Planning of Energy Projects in the Energy Community: Overview, Recommendations, and Best Practices](#) (Permitting study), page 119.
  - 6 Permitting study, page 70.
  - 7 [Commission Recommendation of 18 May 2022 on speeding up permit-granting procedures for renewable energy projects and facilitating Power Purchase Agreements C/2022/3219](#).
  - 8 [Commission Staff Working Document Guidance to Member States on good practices to speed up permit-granting procedures for renewable energy projects and on facilitating Power Purchase Agreements Accompanying the document Commission Recommendation on speeding up permit-granting procedures for renewable energy projects and facilitating Power Purchase Agreements SWD/2022/0149 final](#).
  - 9 [Council Regulation \(EU\) 2022/2577 of 22 December 2022 laying down a framework to accelerate the deployment of renewable energy](#).
  - 10 The Commission Recommendation and Guidance of 2022.
  - 11 [Commission Recommendation \(EU\) 2024/1343 of 13 May 2024 on speeding up permit-granting procedures for renewable energy and related infrastructure projects, and the accompanying guidance to Member States \(SWD/2024/124\)](#).
  - 12 [Communication from the Commission to the European Parliament, the Council, the European economic and Social Committee and the Committee of the Regions 'Action Plan for Affordable Energy: Unlocking the true value of our Energy Union to secure affordable, efficient and clean energy for all Europeans' COM/2025/79 final](#), page 11.
  - 13 [Decision of the Ministerial Council of the Energy Community D/2021/14/MC-EnC](#).
  - 14 [Policy Guidelines by the Energy Community Secretariat on the Permit-Granting and Planning of Energy Projects in the Energy Community PG 02/2024/ 15 June 2024 \(Policy guidelines\)](#).



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In December 2024, the Energy Community Ministerial Council adopted a non-binding Recommendation<sup>15</sup> which calls on CPs to prepare the legal and institutional conditions for implementation of the revised RED provisions. These provisions relate to designating RAAs and accelerating permit-granting procedures. The Recommendation tasks the ECS with supporting CPs in this work.

The aim of this document is to support national, regional and local authorities in CPs to prepare the legal and institutional conditions for implementation of the EU renewables acquis' provisions on accelerated

permit-granting procedures, including the RED II and revised RED requirements for setting up or designating contact points for RE project permitting.

The first chapter of this policy document provides an overview of the legal requirements under the EU renewables acquis. The second chapter examines different RE OSS models, their features and practical applicability. The third chapter provides step-by-step guidance for establishing RE OSS. Annex 1 highlights good practice examples on RE OSS from EU Member States.

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15 Ministerial Council Recommendation 2024/1/MC-EnC on accelerating the deployment of renewable energy projects and implementing the energy efficiency first principle of 12 December 2024.



# **CHAPTER 1: OVERVIEW OF KEY AMENDMENTS UNDER THE EU REVISED RED**

The revised RED adds new rules and introduces changes to the RED II provisions on the organisation and duration of permit-granting procedures for RE projects. Subchapter 1 and Table 1 below comparatively outline and analyse the relevant RED II and revised RED provisions applicable to permit-granting procedures for all RE projects. The following two subchapters reflect on new rules in revised RED concerning the permitting framework for projects within RAAs and frameworks for solar energy equipment, repowering and heat pumps respectively. The final subchapter presents the maximum duration of permit-granting procedures for specific technologies as envisaged in RED II and the revised RED.

## 1.1. Cross-cutting considerations of the permit-granting procedure

In the revised RED, the organisation and main principles applicable to permit-granting procedures for all RE projects are generally provided in one article (Article 16), while the duration and provisions for specific types of projects are set in separate articles (from Article 16a to

Article 16e). Table 1 below compares the main principles of permit-granting procedures as provided in RED II and the revised RED respectively, with key differences listed in the first column and highlighted in bold in the last column.

**Table 1:** Key changes to the main principles of permit-granting procedures

Topics and key changes	RED II (Directive (EU) 2018/2001)	Revised RED (Directive (EU) 2023/2413)
<p><b>Scope of permit-granting procedures</b></p> <ul style="list-style-type: none"> <li>Co-located energy storage included along RE projects, and associated grid assets</li> <li>Environmental assessments and grid connection procedure included</li> </ul>	<p>Covers the relevant administrative permits to build, repower and operate plants for the production of energy from renewable sources and assets necessary for their connection to the grid. (Article 16 (1))</p>	<p>Covers all relevant administrative permits to build, repower and operate renewable energy plants, <b>including those combining different renewable energy sources, heat pumps, and co-located energy storage, including power and thermal facilities</b>, as well as assets necessary for the connection of such plants, <b>heat pumps and storage to the grid, and to integrate renewable energy into heating and cooling networks</b>, including <b>grid-connection permits</b> and, where required, <b>environmental assessments</b>. (Article 16 (1))</p>
<p><b>Start and finalisation of the permit-granting procedures</b></p>	<p>The permit-granting process shall comprise all procedures from the acknowledgment of the receipt of the application to the transmission of the outcome of the procedure. (Article 16 (1))</p>	<p>The permit-granting <b>procedure</b> shall comprise all <b>administrative stages</b> from the acknowledgment of the <b>completeness of the permit application</b> to the <b>notification of the final decision</b> on the outcome of <b>the permit-granting procedure by the relevant competent authority or authorities</b>. (Article 16 (1))</p>

Topics and key changes	RED II (Directive (EU) 2018/2001)	Revised RED (Directive (EU) 2023/2413)
<p>Obligation of competent authority to:</p> <ul style="list-style-type: none"> <li>• review the application within set deadlines</li> <li>• return incomplete application</li> <li>• acknowledge application completeness</li> <li>• notify a final decision</li> </ul>		<p><b>The competent authority shall acknowledge the completeness of the application (or lack thereof) within 30 days of receipt of an application for RE plants in RAAs, and 45 days for RE plants located outside RAAs.</b> (Article 16 (2))</p> <p><b>If the applicant has not sent all the information required to process the application, the competent authority shall request that the applicant submit a complete application without undue delay.</b> (Article 16 (2))</p>
<p><b>Digitalisation</b></p> <p>Obligation to enable permitting in electronic form</p>	<p>Applicants shall be allowed to submit relevant documents also in digital form. (Article 16 (2))</p>	<p>The applicants are allowed to submit relevant documents also in digital form. <b>As of 21 November 2025, the permit-granting procedures should be carried in electronic form.</b> (Article 16 (3))</p>
<p><b>Contact point/s</b></p> <p>Obligation of contact point to follow the permitting deadlines</p>	<p>Member States shall set up or designate one or more contact points. Those contact points shall, upon request by the applicant, guide through and facilitate the entire administrative permit application and granting process.</p> <p>The contact point shall guide the applicant through the administrative permit-application procedure, [...], provide the applicant with all necessary information and, where appropriate, involve other administrative authorities. (Article 16 (2))</p>	<p>Member States shall set up or designate one or more contact points.</p> <p>Those contact points shall, upon the request of the applicant, guide and facilitate <b>the applicant during</b> the entire administrative permit-application <b>and permit-granting procedure.</b></p> <p>The contact point shall guide the applicant through the administrative permit-application procedure, <b>including the steps relating to the protection of the environment</b>, [...], provide the applicant with all necessary information and, where appropriate, involve other administrative authorities.</p> <p><b>The contact point shall ensure that the deadlines for the permit-granting procedures set out in this Directive are met.</b> (Article 16 (3) and (4))</p>
<p><b>Qualified staff</b></p> <p>Obligation to ensure qualified staff and to assist regional and local authorities</p>		<p><b>Member States shall provide adequate resources to ensure qualified staff, upskilling and reskilling of their competent authorities in line with the planned installed renewable energy generation capacity provided for in their integrated national energy and climate plans. Member States shall assist regional and local authorities in order to facilitate the permit-granting procedure.</b> (Article 16 (7))</p>

Topics and key changes	RED II (Directive (EU) 2018/2001)	Revised RED (Directive (EU) 2023/2413)
<p><b>Transparency</b></p> <p>Obligation to publish all permitting-related decisions</p>		<p><b>All decisions in the permit-granting procedure shall be made publicly available.</b> (Article 16(9))</p>
<p><b>Public participation</b></p> <p>Obligation to include local communities in the projects</p>		<p><b>Member States shall promote public acceptance of RE projects by means of direct and indirect participation of local communities in those projects.</b> (Article 15d (2))</p>
<p><b>Settlement of disputes</b></p> <p>Obligation to ensure that:</p> <ul style="list-style-type: none"> <li>the general public has access to the settlement of disputes, including ADR</li> <li>RE-related disputes are solved in the most expeditious administrative and judicial procedure</li> </ul>	<p>Member States shall ensure that applicants have easy access to simple procedures for the settlement of disputes concerning the permit-granting procedure and the issuance of permits to build and operate renewable energy plants, including, where applicable, alternative dispute resolution mechanisms. (Article 16 (5))</p>	<p>Member States shall ensure that applicants <b>and the general public</b> have easy access to simple procedures for the settlement of disputes concerning the permit-granting procedure and the issuance of permits to build and operate renewable energy plants, including, where applicable, alternative dispute resolution mechanisms. (Article 16 (5))</p> <p><b>Member States shall ensure that administrative and judicial appeals in the context of a project for the development of a renewable energy plant, the connection of that plant to the grid, and the assets necessary for the development of the energy infrastructure networks required to integrate energy from renewable sources into the energy system, including appeals related to environmental aspects, are subject to the most expeditious administrative and judicial procedure that is available at the relevant national, regional and local level.</b> (Article 16 (6))</p>
<p><b>Overriding public interest</b></p> <p>Presumption that RE projects, storages and related grid are in public interest provided that certain conditions are met</p>		<p><b>Permit-granting procedure, 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 when balancing legal interests in individual cases for the purposes of Article 6(4) and Article 16(1), point (c), of Directive 92/43/EEC (<i>Habitats Directive</i>), Article 4(7) of Directive 2000/60/EC (<i>Water Framework Directive</i>) and Article 9(1), point (a), of Directive 2009/147/EC (<i>Birds Directive</i>).</b> (Article 16f)</p>

**Both RED II and the revised RED define the scope of the permit-granting procedure as encompassing the entire administrative process** covering all relevant administrative permits to build, repower and operate renewable energy plants. The revised RED further specifies that it also includes grid-connection permits and required environmental assessments. Moreover, in the revised RED, the procedure includes not only stand-alone renewable energy plants and their associated grid-connection assets, as in RED II, but also covers hybrid projects that combine multiple renewable technologies, including heat pumps and co-located power and thermal storage, as well as the grid-connection assets of such hybrid facilities. In this respect, the permit-granting procedure encompasses a broader range of administrative permits than under RED II.

Concerning *the initiation of the permit-granting procedures*, the revised RED is more precise: the procedure begins not at the acknowledgment of the receipt of the application as stipulated in RED II, but at the acknowledgment that the application is complete.<sup>16</sup>

**The competent authorities must acknowledge the completeness of the application within 30 days for RE plants in RAAs and within 45 days for plants outside these areas.** Concerning *the finalisation of the procedure*, the revised RED provision is also more specific than RED II. Namely, the revised RED explicitly stipulates that it ends when the applicant is notified of the final decision by competent authorities.<sup>17</sup>

Both RED II and the revised RED provide that the applicant may submit relevant documents in digital form. However, the revised RED requires all permit-granting procedures to be carried out in electronic form after 21 November 2025.

*Contact points* were and remain tasked with guiding applicants through the permit application and permit-granting procedures, being the sole point of contact for applicants and coordinating with competent authorities as needed. They are responsible for making available a manual of procedures for developers and for providing that information online, including information about contact points relevant to the application in

question. The revised RED includes the important novelty that contact points are also responsible for ensuring that permit-granting deadlines are respected.

The revised RED introduces new provisions requiring that *sufficient resources* must be allocated to ensure that the competent authorities have appropriately qualified personnel who benefit from continuous upskilling and reskilling, being able to manage increased number of applications in line with the projected RE generation capacity set out in their integrated national energy and climate plans. In addition, to ensure efficient handling of applications, the revised RED introduces the requirement for regional and local authorities to be assisted in facilitating the permit-granting procedures.

The revised RED places emphasis on *transparency and public participation* in permit-granting procedures, which is an addition when compared to RED II. Namely, decisions resulting from the permit-granting procedures shall be made publicly available in accordance with the applicable law. The revised RED emphasises the importance of public acceptance of RE projects, and requires authorities to actively encourage both direct and indirect participation of local communities in these projects.

Furthermore, under the revised RED, access to straightforward procedures for *resolving disputes* related to permitting, including alternative dispute resolution (ADR) mechanisms, is extended beyond applicants to cover the general public. Under RED II they were limited to applicants only. Member States must ensure that any administrative or judicial appeals related to RE projects, including appeals related to environmental aspects, are handled through the fastest available procedures at the national, regional or local level.

One more key novelty introduced by the revised RED is the recognition of RE deployment as being in the *overriding public interest*. Overriding public interest is a principle that can be invoked to allow certain projects when they do not have significant adverse effects on the environment. This is because their broader societal benefits, such as protecting public health and safety, are considered essential.<sup>18</sup> The presumption is not

<sup>16</sup> In case of an incomplete application the competent authority shall request that the applicant submit missing documents and/or information without undue delay.

<sup>17</sup> RED II uses vague terminology: “transmission of the outcome of the procedure”.

<sup>18</sup> Recital 44 of revised RED.

applied automatically to all RE projects, but rather in individual permitting cases when authorities weigh competing legal interests, such as deployment of RE and environmental protection for the purpose of specific environmental assessments under Habitats, Water and Birds directives.<sup>19</sup> This means that when conducting particular environmental assessments, authorities presume that the RE project serves the public interest and then assess the remaining elements

(alternatives, likely impacts, mitigation measures and, where applicable, compensatory measures).

The correct application of the EU environmental acquis remains essential in this process, as it provides the legal framework within which this presumption operates and is a prerequisite for the effective transposition and implementation of the provision of the revised RED.

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<sup>19</sup> Derogations from strict species and habitat protection rules under the Habitats Directive (Article 6(4) and Article 16(1)(c)), Exceptions to rules on preventing deterioration of water bodies under the Water Framework Directive (Article 4(7)), and Derogations from bird protection rules under the Birds Directive (Article 9(1)(a)).



## 1.2. Permit-granting procedures in renewables acceleration areas

A significant novelty of the revised RED is the introduction of the concept of Renewables Acceleration Areas (RAAs). These areas are defined as land, inland water and sea areas where the deployment of a specific type or specific types of renewable energy sources is not expected to have a significant environmental impact.<sup>20</sup> It prioritises locations such as degraded land, rooftops and industrial sites, while excluding Natura 2000 sites and areas protected under national nature and biodiversity protection regimes.<sup>21</sup>

Competent authorities should prepare one or more plans designating RAAs, explaining the rationale and methodology used to select the technologies and types of areas included. An integrated part of the RAA plan is a mitigation rulebook that, for each area, identifies likely adverse environmental impacts and sets binding, effective and timely mitigation measures for RE plants, co-located storage and related grid infrastructure to avoid those impacts or, when that is not possible, to significantly reduce them in order to ensure compliance with the Habitats, Birds and Water Framework Directives (including the no-deterioration obligation). The RAA plan, along with the mitigation rulebook, is subject to Strategic Environmental Assessments (SEA) and, where relevant, appropriate assessment<sup>22</sup> under the Habitats Directive.

**Within these designated areas, the revised RED provides the following measures to accelerate permitting:**

- ➔ **Default rule:** Projects are exempt from a dedicated EIA and, where relevant, a Natura 2000 appropriate assessment, unless fast EIA screening indicates otherwise.<sup>23</sup>
- ➔ **Fast screening deadlines:** Screening must be complete within 45 days (for new applications) or 30 days (for projects ≤150 kW and for repowering).<sup>24</sup>

- ➔ **When an EIA is required:** If screening identifies significant unforeseen adverse effects (not covered by the RAA plan assessment) that cannot be mitigated by measures in the plan or proposed by the developer, the authority must adopt an explicit decision requiring an EIA and publish it.<sup>25</sup>

- ➔ **EIA timeframe (if required):** The EIA must be completed within six months (extendable once by up to six months).<sup>26</sup>

- ➔ **Transboundary check:** Screening must also determine whether Article 7 of EIA Directive 2011/92/EU is triggered (likely significant effects in another Member State or a request for involvement).<sup>27</sup>

- ➔ **Tacit approval in specific intermediary steps:** If the competent authority does not reply within the established deadline, the specific intermediary administrative steps shall be considered as approved. This rule does not apply to final decisions, nor to RE projects which are subject to an EIA and in those jurisdictions where the national legal system does not recognise the principle of administrative tacit approval.<sup>28</sup>

- ➔ **Shorter deadlines for permit-granting:** Deadlines are set at half the duration of those applicable outside RAAs. The table in the subchapter below lists all timeframes envisaged in RED II and the revised RED.<sup>29</sup>

- ➔ **Public participation:** The affected or likely to be affected public must be involved in the process of developing the RAA plan by being informed and having their input taken into account before the final adoption.<sup>30</sup>

<sup>20</sup> Article 15c revised RED.

<sup>21</sup> For more information on how the low-conflict zones should be mapped, and RAAs designated, see the Energy Community Secretariat and the Nature Conservancy, the [Operational Blueprint: designation of RAAs](#)

<sup>22</sup> Article 6(3) Habitats Directive states the following: *Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.*

<sup>23</sup> Article 16a (5) revised RED.

<sup>24</sup> Article 16a (4) revised RED.

<sup>25</sup> Article 16a (5) revised RED.

<sup>26</sup> Article 16a (5) revised RED.

<sup>27</sup> Article 16a (4) revised RED.

<sup>28</sup> Article 16a (6) revised RED.

<sup>29</sup> Article 16a (1) revised RED.

<sup>30</sup> Article 15d (1) revised RED.

## Environmental Assessments in the EU Environmental and Renewable Energy Acquis

Multiple environmental assessments are sometimes required for a single RE project. Namely, all RE projects are subject to an EIA under the Environmental Impact Assessment Directive,<sup>31</sup> although small-scale projects are often exempt under national law. An appropriate assessment under the Habitats Directive<sup>32</sup> is required for projects that might have impacts on Natura 2000 sites, while the assessment under the Water Framework Directive<sup>33</sup> is required for projects which are likely to result in the deterioration of the status of water bodies.

If the obligation to carry out assessments under the EIA Directive, Habitats Directive and/or Birds Directive<sup>34</sup> arises simultaneously from these directives, the EIA Directive requires streamlining of the procedures in a joint or coordinated approach.<sup>35</sup>

Under a joint procedure, the environmental impacts of a project are assessed through a single, unified assessment that replaces multiple separate assessments. Under a coordinated procedure, multiple separate assessments still take place, with a designated authority overseeing and coordinating them and serving as a single point of contact.<sup>36</sup> The choice between a joint or coordinated approach is left to the discretion of national authorities, provided that all substantive and procedural requirements of each applicable directive are fully met.

The revised RED follows a similar approach. If environmental assessments pursuant to both the EIA Directive and Habitats Directive are required for RE projects outside an RAA, these shall be carried out in a single procedure that combines both assessments.<sup>37</sup>

When it comes to the Water Framework Directive, an “applicability assessment” (ApA) should be carried out to determine whether a derogation under Article 4(7), from the no-deterioration obligation and the duty to achieve/maintain good status, may be relied upon for a new project or modification. Where obligations under the EIA Directive and the Water Framework Directive apply concurrently, streamlining is not mandatory. The decision to extend such streamlining is left to the discretion of the individual Member States.<sup>38</sup>

31 [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 as amended by Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment.](#)

32 [Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.](#)

33 [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.](#)

34 [Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds \(OJ L 20, 26.1.2010, p. 7\).](#)

35 Article 2(3), EIA Directive.

36 [European Commission, Commission Notice: Commission guidance document on streamlining environmental assessments conducted under Article 2\(3\) of the Environmental Impact Assessment Directive \(Directive 2011/92/EU, as amended by Directive 2014/52/EU\), 2016/C 273/01.](#)

37 Article 16b (2) revised RED.

38 [Commission Notice: Commission guidance document on streamlining environmental assessments, C 273/3, section 3.2.](#)



### 1.3. Special procedures for repowering, solar energy equipment and heat pumps

The revised RED introduces specific procedural rules and deadlines for repowering of existing RE plants,<sup>39</sup> solar energy equipment and heat pumps. This subchapter will outline these rules, while the exact timeframes of permit-granting procedures will be listed in the subchapter below.

For repowering projects, when the capacity increase of a RE plant does not exceed 15%, the project benefits from shortened grid connection timelines of three months, unless there are justified safety concerns or there are technical incompatibilities with the system components.<sup>40</sup> Moreover, if repowering a RE plant requires a screening process, a determination of whether the project requires an environmental assessment or, in the end, environmental assessments, these should focus only on the impacts caused by the changes or extensions compared to the original project.<sup>41</sup> Finally, repowering of solar installations that remain within their existing spatial footprint are exempt from additional environmental screening, determination or assessments, provided that they still comply with existing mitigation measures.<sup>42</sup>

The installation of solar energy equipment and co-located storage in existing or future artificial structures are exempt from EIA requirements as long as the primary aim of such artificial structures is not solar energy production or energy storage.<sup>43</sup> This exemption does not include artificial water

surfaces. Small installations of 100 kW or less, including those of self-consumers and energy communities, should also be processed in a short timeframe of one month and include tacit approval for the final stage or permitting (the permit being considered as granted) if authorities do not respond in time.<sup>44</sup> If applying the capacity threshold mentioned above creates a significant administrative burden or limits the operation of the electricity grid, Member States may set a lower threshold, as long as it is above 10.8 kW.<sup>45</sup>

The maximum duration of permit-granting procedures is one month for heat pumps below 50 MW and three months for ground-source heat pumps. Grid connections should be authorised within two weeks of notifying the competent entity for heat pumps with an electrical capacity of up to 12 kW. This two week authorisation requirement should be extended to heat pumps of up to 50 kW if installed by renewable self-consumers in situations where the electrical capacity of the renewable electricity generation installation represents at least 60% of the heat pump's electrical capacity.<sup>46</sup> The revised RED in this case encourages the pairing of heat pumps with on-site renewable electricity installation by simplifying connection procedures, provided that a significant share (60%) of the heat pump's electricity demand is covered by renewables.

39 Repowering refers to the process of replacing or upgrading existing renewable energy installations, such as wind turbines or solar panels, with newer and more efficient technologies that have become available since the original project was commissioned (RES Simplify report, page 120).

40 Article 16c (1) revised RED.

41 Article 16c (2) revised RED.

42 Article 16c (3) revised RED.

43 Article 16d (1) revised RED.

44 Article 16d (2) revised RED.

45 Article 16d (2) revised RED.

46 Article 16e (2) revised RED.



## 1.4. Maximum duration of permit-granting procedures

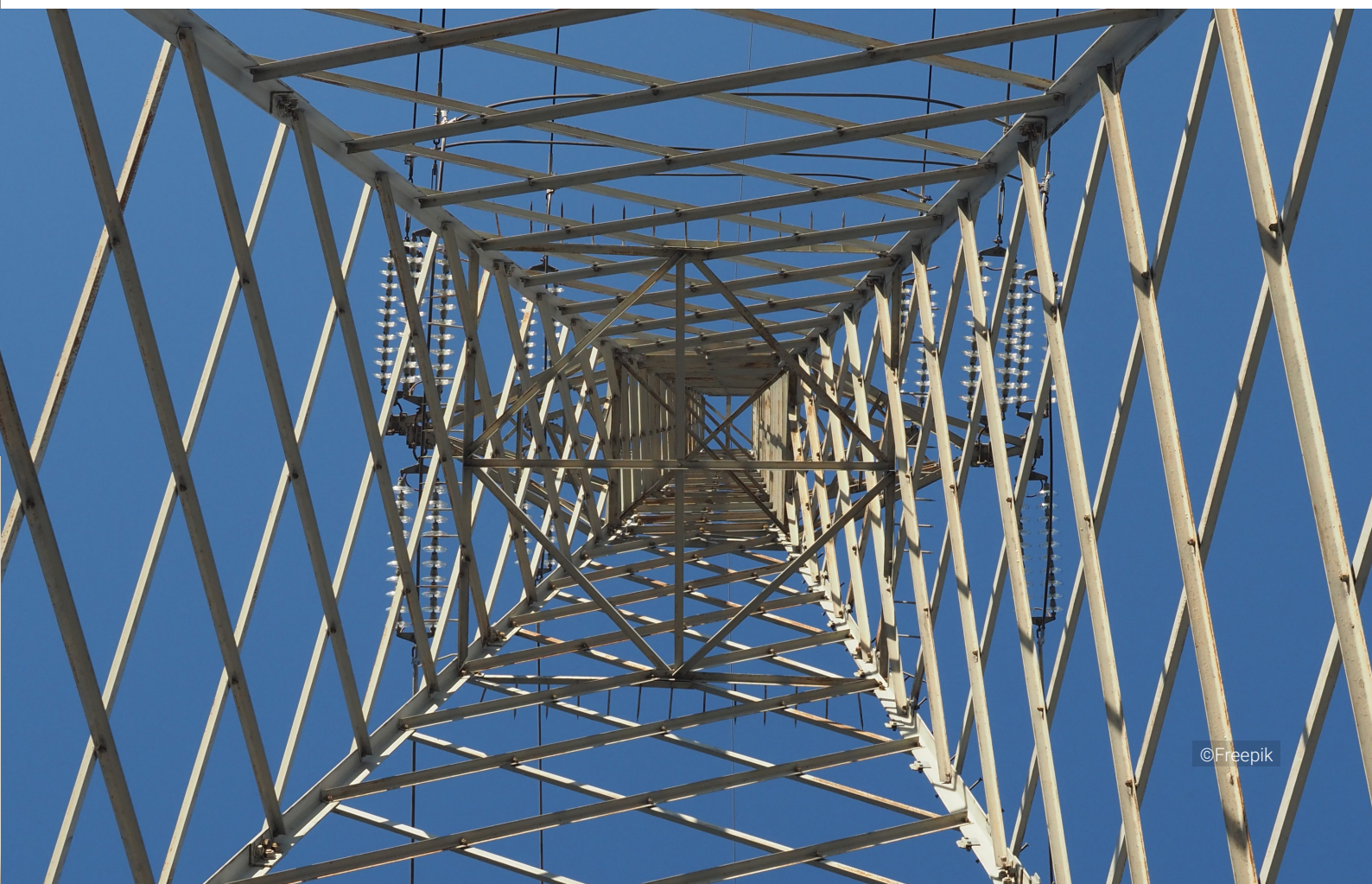
When it comes to *the duration of permit-granting procedures*, RED II covered a general deadline applicable for all RE plants, for repowering and for small installations up to 150 kW. The revised RED makes timelines more specific by introducing new technology-specific deadlines for all offshore RE plants,<sup>47</sup> and particularly for offshore wind, as well as for heat pumps, solar energy equipment and co-located storage. It also makes the previously existing repowering deadlines shorter. Moreover, the RAA concept is introduced in the revised RED, which makes a distinction between deadlines for projects developed inside and outside of RAAs. Since RED II did not clearly

specify which periods counted toward permit-granting timelines, the revised RED addresses this by defining what is excluded from the permit-granting duration: the time spent on constructing or repowering the project, the time for administrative stages needed for major grid upgrades and the time taken for judicial appeals or other dispute-resolution processes.<sup>48</sup> Where duly justified by extraordinary circumstances, including the need for longer timeframes to carry out assessments under applicable Union environmental law, these deadlines may be extended for specific durations.

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<sup>47</sup> The EU Offshore Renewable Energy Strategy (COM (2020)741) describes offshore renewable energy in the context of offshore wind energy and ocean/ marine energy technologies such as wave and tidal energy and other emerging technologies (e.g., floating solar).

<sup>48</sup> Article 16 (8) revised RED.



**Table 2:** Maximum duration of permit-granting procedures according to RED II and revised RED

Covered in RED II and revised RED				
Type of installations	General	Installations less than 150 kW	Repowering	
RED II (Article 16)	2 years + 1 year <sup>49</sup>	1 year + 1 year	1 year + 1 year 6 months for grid connection	
Revised RED – in RAAs (Article 16a)	12 months + 6 months	6 months + 3 months	6 months + 3 months	
Revised RED - Outside RAAs (Article 16b)	2 years + 6 months	12 months + 3 months	12 months + 3 months Capacity increase <15 %: 3 months for grid connection Offshore RE projects: 2 years + 3 months	
Newly introduced in revised RED				
Type of installations	Offshore RE projects	Co-located storage	Solar energy equipment <sup>50</sup> (Article 16d)	Heat pumps (Article 16e)
RED II (Article 16)	-	-	-	-
Revised RED – in RAAs (Article 16a)	2 years + 6 months Offshore wind: 12 months + 6 months	6 months + 3 months	In existing or future artificial structures, including buildings: 3 months <sup>51</sup> Capacity of 100 kW or less: 1 month	Up to 50 MW: 1 month Ground source heat pumps: 3 months
Revised RED - Outside RAAs (Article 16b)	2 years + 3 months	12 months + 3 months		Up to 12 kW and 50 kW of RE self-consumers combined with the PV: 2 weeks for grid connection <sup>52</sup>

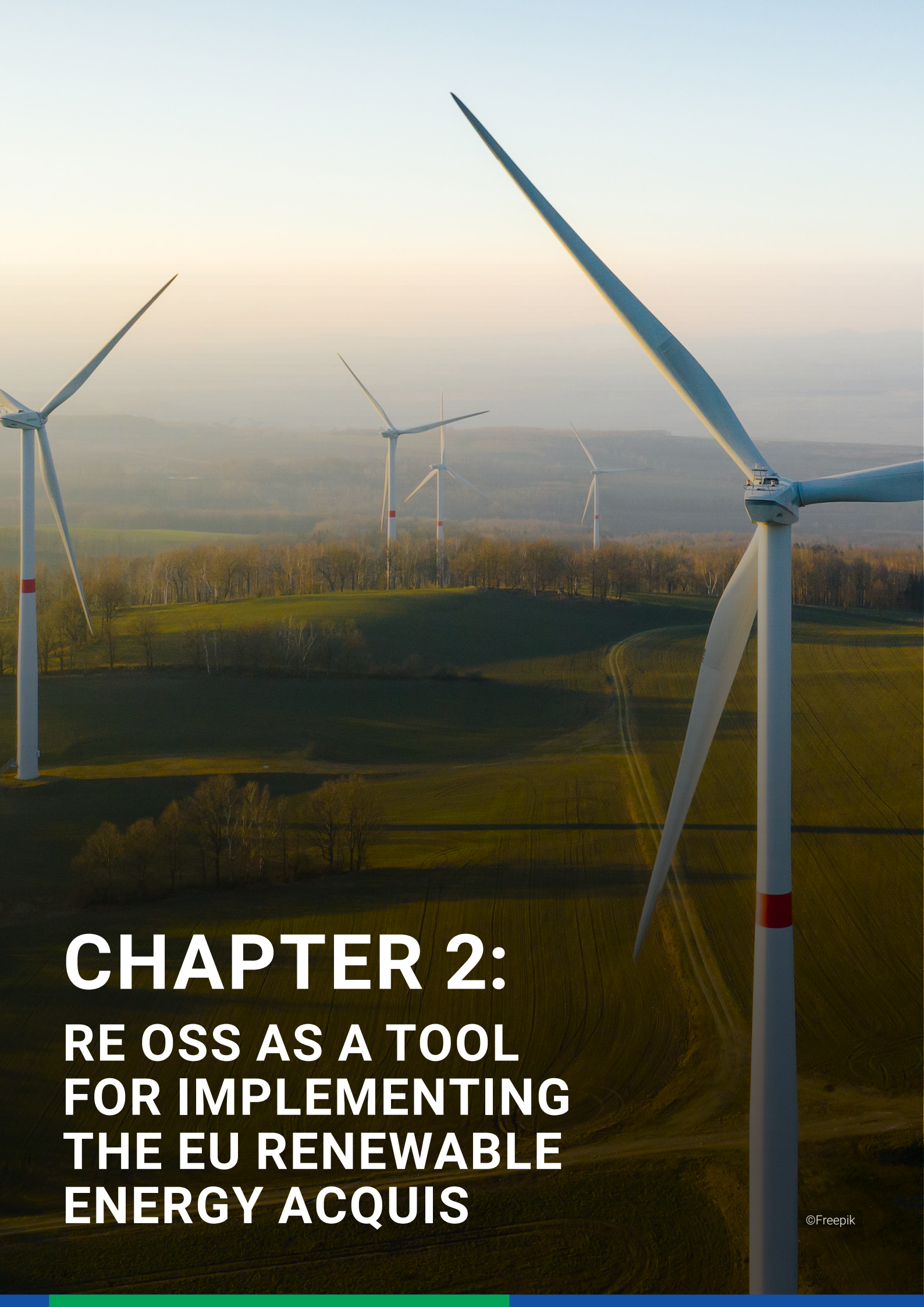
49 In this table, the first number (e.g. in "2+1", the "2") indicates the timeframe for completing the permit-granting procedure, while the second number indicates the possible extension of that timeframe.

50 These timeframes apply to solar energy equipment including co-located storage.

51 This rule is applicable provided that the primary aim of such artificial structures is not solar energy production or energy storage.

52 This rule is applicable if the electrical capacity of a self-consumer's renewable electricity generation installation amounts to at least 60% of the electrical capacity of the heat pump.





# CHAPTER 2: RE OSS AS A TOOL FOR IMPLEMENTING THE EU RENEWABLE ENERGY ACQUIS

The EU renewable energy acquis requires setting up or designating one or more contact points whose main function is to guide and facilitate applicants for RE projects throughout the permit-granting procedures. The RES Simplify study indicated that establishing an OSS can simplify and accelerate RE projects by reducing the complexity of permit procedures for project developers and increasing efficiency and transparency.<sup>53</sup>

It is important to clarify that the terms “contact points”, “one-stop-shop”<sup>54</sup> and “single contact point” are used interchangeably in EU policy and legal documents. RED II introduced the term contact point, while the revised RED kept using this term and introduced the term single contact point specifically for joint offshore renewable energy.<sup>55</sup> The 2022 Commission Recommendation (EU) 2022/822 and the 2024 Commission Recommendation (EU) 2024/1343 use the term “one-stop-shop” under the section *Improving internal coordination*, while the EU Commission’s guidance on good practices for speeding up permit-granting procedures uses all three terms. For the purposes of this Protocol, the term “one-stop-shop” is used as an operational mechanism through which the functions attributed to contact points under the EU renewables acquis are implemented.

Main task of OSSs is to ensure that the internal coordination among competent authorities is improved. This is accomplished through limiting the number of authorities involved in the permitting, facilitating early and continuous coordination with project developers and relevant authorities to promote consistent interpretation of permitting rules, building capacity and identifying project needs and delaying risks in a timely manner.<sup>56</sup>

The Energy Community Permitting study<sup>57</sup> identifies various models for the operation of OSSs, distinguishing them according to their assigned responsibilities and the level of government by which they are established. Namely, it describes an OSS which coordinates necessary permits by liaising with multiple authorities and another which autonomously assesses applications and grants permits after reviewing submitted documents.<sup>58</sup> It also highlights the potential for varying the model of OSSs – local, regional or national – to cater to different project sizes, from small household projects to large-scale ventures, as well as renewable energy technologies. Finally, the Permitting study recommends that a national body be established to regularly monitor bottlenecks in the development of RAAs and issue recommendations to address them.<sup>59</sup>

Building upon this study, we examine different OSS models for RE projects, distinguishing them by their responsibilities, the level of government that creates them and the types and sizes of projects they serve. This chapter explores how these models can help facilitate the implementation of the EU renewable energy acquis on permitting of RE projects.

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53 RES Simplify, page 86.

54 The RES Simplify report uses the following definition for OSS: “One Stop Shop in public administration refers to the ability to carry out all the necessary bureaucratic steps in one place.” RES Simplify report page 86.

55 Article 1 (4) (b) revised RED.

56 Commission Recommendation 2024, recitals 15 and 16.

57 Permitting study, page 71.

58 Renewable Energy Directive, as explained in the second chapter, does not stipulate that a single contact point issues permits instead of the competent authorities, but that it guides the applicant through and facilitates the entire administrative permit application and granting process.

59 Permitting study, page 82.

## 2.1. Models of RE OSS by scope of responsibility

RE OSS models can be distinguished according to the scope of responsibilities assigned to them, ranging from information and advisory functions to coordination roles and full permit-granting authority. Each model will be explained in the sections below.

### 2.1.1. RE OSS providing information and guidance – partial alignment with the revised RED requirements

This type of OSS is the basic model that focuses solely on providing developers with information and guidance for RE projects by compiling all relevant details on the permit-granting procedures in a single information system. It may cover a wide range of information including step-by-step guidance on the project development process and key stages such as data collection in the pre-application process, necessary permits and the documents that need to be submitted. This includes relevant links, detailed explanations, and practical instructions – both in the official language of a country and English to ensure accessibility for foreign investors. These services are usually provided on the online platform.

This OSS may also fulfil an advisory role by providing tailored, one-to-one consulting support for RE developers and guiding them through technical, administrative and procedural requirements throughout the project development process.

This model does not constitute a contact point for the facilitation or coordination of the permitting procedure and thus does not meet the full requirements under the EU renewables acquis. It partially meets the obligation by providing procedural guidance, directing applicants to the

competent authorities and making relevant information accessible in a centralised manner, as required under Article 16 (3) of the revised RED.

It may serve as a transitional or complementary mechanism, offering guidance and support as broader digitalisation reforms of permit-granting procedures are implemented. By serving as a bridge between traditional manual processes and fully digital workflows, it can help ensure consistency, efficiency and clarity during the early phases of reform, when new systems are still being developed and tested. Over time, its function could evolve from being primarily informative to being a coordinating entity, fully integrating all procedures and authorities involved in permit-granting procedures. This approach may be faster and more cost-effective to implement. However, there is a risk that it could be seen as a sufficient solution, potentially slowing further digitalisation and integration efforts. To mitigate this risk, its role should be clearly framed as transitional or complementary, with a defined pathway toward full integration of permit-granting procedures over time.

For practical examples see [the case study of Borzen Slovenia](#) provided in Annex 1.



### 2.1.2. Coordinating RE OSS – full alignment with the revised RED requirements

This type of OSS aims not only to provide guidance and information, but also to facilitate and coordinate various permitting authorities involved in the permit-granting process and to serve as a sole contact point for developers. Moreover, this model is responsible for ensuring that the deadlines for the issuance of permits are met.<sup>60</sup> In this regard, the OSS has the competence to alert administrative bodies when the deadline is approaching, as well as to require them to report to the OSS on the processing time.<sup>61</sup> To effectively implement such competences, all authorities involved in the permitting procedure should have a binding legal obligation to cooperate with the OSS and provide information on the progress of the processing.

It is important to emphasise that the responsibility for issuing different types of permits and licenses remains within the existing competent authorities.

As both RED II and the revised RED prescribe that OSSs shall guide the applicant through and facilitate the entire administrative permit application and granting process, this model of OSS is well-positioned to respond to that guiding function of contact points. Being the contact point for developers, coordinating the permit-granting procedure and ensuring deadlines are met, this OSS most directly aligns with the role of a contact point as envisaged in RED II and the revised RED.

For a practical example, see [the case study of the Netherlands](#) provided in Annex 1.

### 2.1.3. RE OSS with permit-granting responsibility – goes beyond the revised RED requirements

This advanced OSS model streamlines the permit-granting procedures by consolidating multiple permitting procedures into a single, integrated framework. Under this approach, once the application and documentation are received, they are forwarded to internal staff who can, where appropriate, work on their respective areas in parallel in order to facilitate a more efficient review process.<sup>62</sup> After reviewing the application, the OSS issues a single decision integrating the outcomes of all relevant assessments and permitting steps.

The main difference compared to other types of OSS setups described above is that this OSS is authorised to issue permits.

This OSS model can be effectively combined with a coordination model that aligns multiple competent authorities, acknowledging that the full project lifecycle often cannot be covered by a single institution. In practice, the number of permits and licensing steps incorporated under one OSS varies. While the OSS may be responsible for processing and issuing certain permits, such as construction, environmental or planning approvals, other steps, such as grid connection, are in the exclusive competence of the network operator.<sup>63</sup> However, grid connection should be facilitated and covered by the coordinating activities of the OSS as concluded in the RES Simplify study.<sup>64</sup>

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60 The contact point shall ensure that the deadlines for the permit-granting procedures set out in this Directive are met. Article 16(3) the revised RED.

61 This feature is prescribed in the Executive Order of Danish Energy Agency, section 11, <https://www.retsinformation.dk/eli/lta/2024/773>

62 RES Simplify, page 86.

63 Article 42 of [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 \(recast\)](#).

64 RES Simplify, page 176.

In this hybrid approach, the OSS serves both as a permitting authority and a coordination hub, while simultaneously issuing permits within its mandate and orchestrating information flows and timelines among all other competent bodies.

An OSS that issues permits is usually established by transferring permitting competences from existing authorities to the OSS, which, given that these competences are typically dispersed across multiple institutions, may require amendments to the legislation governing permit-granting procedures. Alternatively, the OSS may be structured by seconding experts from the competent authorities to the OSS. In this case, legislative amendments are generally not required, as the competences remain with the original authorities while staff are assigned to the OSS.

National experts consulted in the RES Simplify also flags that bottlenecks can be created if the authorities are understaffed or lack expertise.<sup>65</sup> Accordingly, OSS personnel should have adequate capacity, experience and training to assess applications properly and, where empowered to do so, to take responsibility for final decisions. This challenge can be addressed by engaging experts who

have already worked on the relevant applications, as well as by implementing targeted upskilling and reskilling programmes to ensure an adequate workforce, in line with the requirements of the revised RED. In addition, the establishment of a technology-specific OSS, staffed with personnel specialised in particular technologies, may be appropriate for this model. There is an example of this in [the case study of Denmark](#) provided in Annex 1, which describes how the Danish Energy Agency is responsible for issuing permits for offshore wind.

It is important to note that neither RED II nor the revised RED explicitly require the establishment of a unified permitting procedure under a single authority. Rather, they call for the designation of one or more contact points that guide and facilitate the permit-granting procedures,<sup>66</sup> while the competent authorities are the ones who review the application, acknowledge its completeness and issue the final decision. However, the key benefit of this model is that applicants engage in a single, coordinated process and receive one clear decision, rather than navigating multiple fragmented approvals, thereby enhancing efficiency through integration and parallel processing.

#### 2.1.4. Optional features of RE OSS – technical assistance and financial support

Each model described above may integrate additional features to support developers in effective preparation and development of RE projects. Namely, an OSS may establish a comprehensive database of available financial support mechanisms, including grants, tax incentives and support schemes at the local, national, regional or EU level. That way, the OSS can help developers navigate the complex landscape of financial opportunities and help to identify and match the right financial options to specific projects.

An OSS may play a vital role in facilitating connections between developers, international financial institutions (IFIs), governments and other stakeholders who are interested in funding and/or supporting RE projects. By serving as an intermediary, the OSS may organise events, platforms or networks to bring these stakeholders

together, making it easier for developers to secure the necessary capital to bring their projects fruition.

The OSS can equip its platform with advanced financial tools, such as calculators and models, to assist in project planning, including calculating expected returns on investment, determining payback periods and analysing overall financial performance. This approach is particularly relevant for small-scale projects, where costs and returns can be more easily anticipated. An example is provided in [the case study on tools for assessing the viability of PV rooftop installations](#).

Moreover, to assist small-scale projects, such a platform may also provide information on certified installers of PV installations or heat pumps, including their qualifications, areas of expertise and contact details in order to support project development and implementation.

<sup>65</sup> RES Simplify, page 87.

<sup>66</sup> Article 16(1) RED and 16(3) revised RED.

On the other hand, utility scale projects could benefit from maps of available grid capacity which they can use to check if a project on the selected site could be easily connected to the grid. Furthermore, maps showing RES potential, such as wind and solar atlases, and sensitivity maps for specific wildlife species, can be linked to on the OSS platform to help developers identify optimal areas for their projects.

These features are not explicitly required under the provisions of RED II or the revised RED, but they serve as additional support that helps developers and other interested parties to inform themselves on aspects relevant for project development.

## Permitting Schemes under TEN-E Regulation

The Regulation on Trans-European Energy Infrastructure (TEN-E Regulation) regulates the permit-granting procedure for cross-border infrastructure projects, referred to as Projects of Common and Mutual Interest (PCIs and PMIs).<sup>67</sup>

The Regulation envisages the designation of national competent authorities (NCAs) to serve as one-stop-shops for permitting the cross-border infrastructure projects.<sup>68</sup> The scope of their responsibilities depends on the permitting scheme chosen by each jurisdiction. Namely, TEN-E Regulation stipulates three schemes: an integrated scheme where the NCA issues all permits, a coordinated scheme where the NCA has power to issue decisions if the competent authority fails to do so and a collaborative scheme where the NCA coordinates and monitors deadlines while competent authorities issue decisions individually. The majority of Member States have chosen collaborative schemes, as it closely matched the existing permitting framework and required minimal or no changes to legislation or administrative procedures.<sup>69</sup>

<sup>67</sup> Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on guidelines for trans-European energy infrastructure, amending Regulations (EC) No 715/2009, (EU) 2019/942 and (EU) 2019/943 and Directives 2009/73/EC and (EU) 2019/944, and repealing Regulation (EU) No 347/2013.

<sup>68</sup> Article 8 (1) of TEN-E Regulation.

<sup>69</sup> European Commission, Study on national permit granting process applicable to energy transmission infrastructure projects with a focus on projects of common interest and projects of mutual interest under Chapter III of Regulation (EU) 2022/869 Overview Report, February 2025.



## 2.2. RE OSS models according to administrative level and project size

The revised RED allows for setting up or designating multiple contact points, implying that RE OSSs may operate at different administrative levels supporting varying RE projects. Namely, an RE OSS may be organised at the local, regional and national level, specialising for specific technologies and project sizes. Organising OSSs in this subsidiary way ensures that particular project needs are met effectively while maintaining personal contact with authorities who understand local and regional contexts.

Local OSSs are best suited for citizens, communities and small businesses engaged in developing small-scale projects, as these actors and groups often lack knowledge and experience with RE project development. An OSS can serve as an accessible

hub for information and offer step-by-step guidance for effectively navigating permitting procedures. Moreover, a local OSS for small-scale RE projects often offers additional services, providing to customers holistic packages to finance, purchase and install RE technologies or guidance on energy efficiency services.<sup>70</sup> A practical example of a local office for small RE projects is described in [the case study on Vienna's contact point for local RE projects](#), as provided in Annex 1.

Regional OSSs can support projects developed in the territory of one region, ensuring coordination across municipalities. Finally, national OSSs typically focus on large-scale and complex projects, especially cross-border infrastructure projects as envisaged in the TEN-E regulation.

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<sup>70</sup> Consumers International, [Designing a one-stop-shop for consumer renewable energy systems](#).



## 2.3. Specialised RE OSS for RAAs

As the revised RED introduced specific provisions for projects developed within RAAs, including a shorter screening time for EIA and shorter permit-granting timeframes, a dedicated OSS could serve as a contact point for RE project applicants in specific areas outlined in RAA plans.

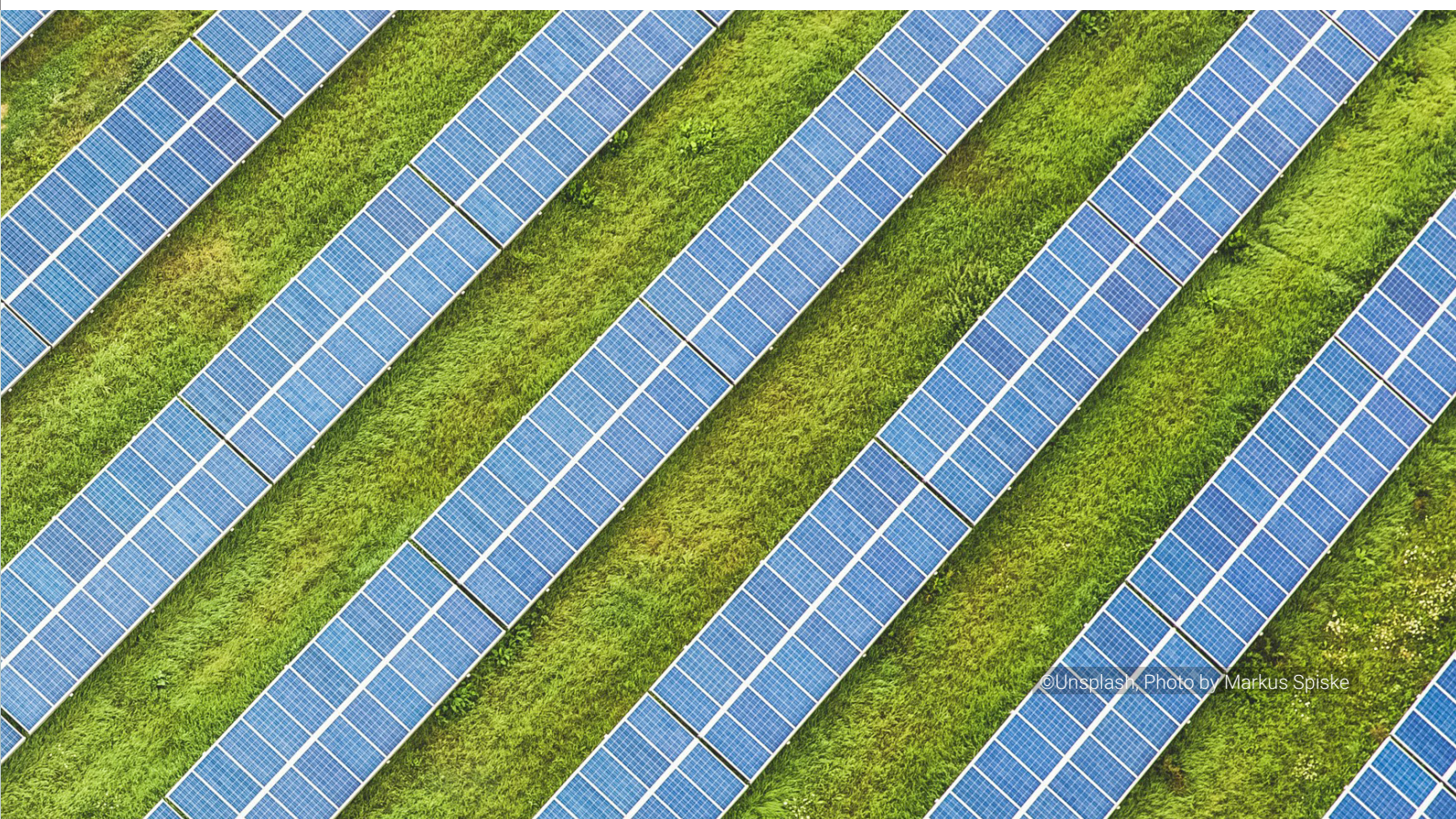
Namely, OSS staff, as well as competent authorities involved in the issuance of permits, would be equipped with the specific knowledge and understanding of the regulatory framework for RAAs, the characteristics of the RAAs and mitigation measures that project developers must meet for each specific area.

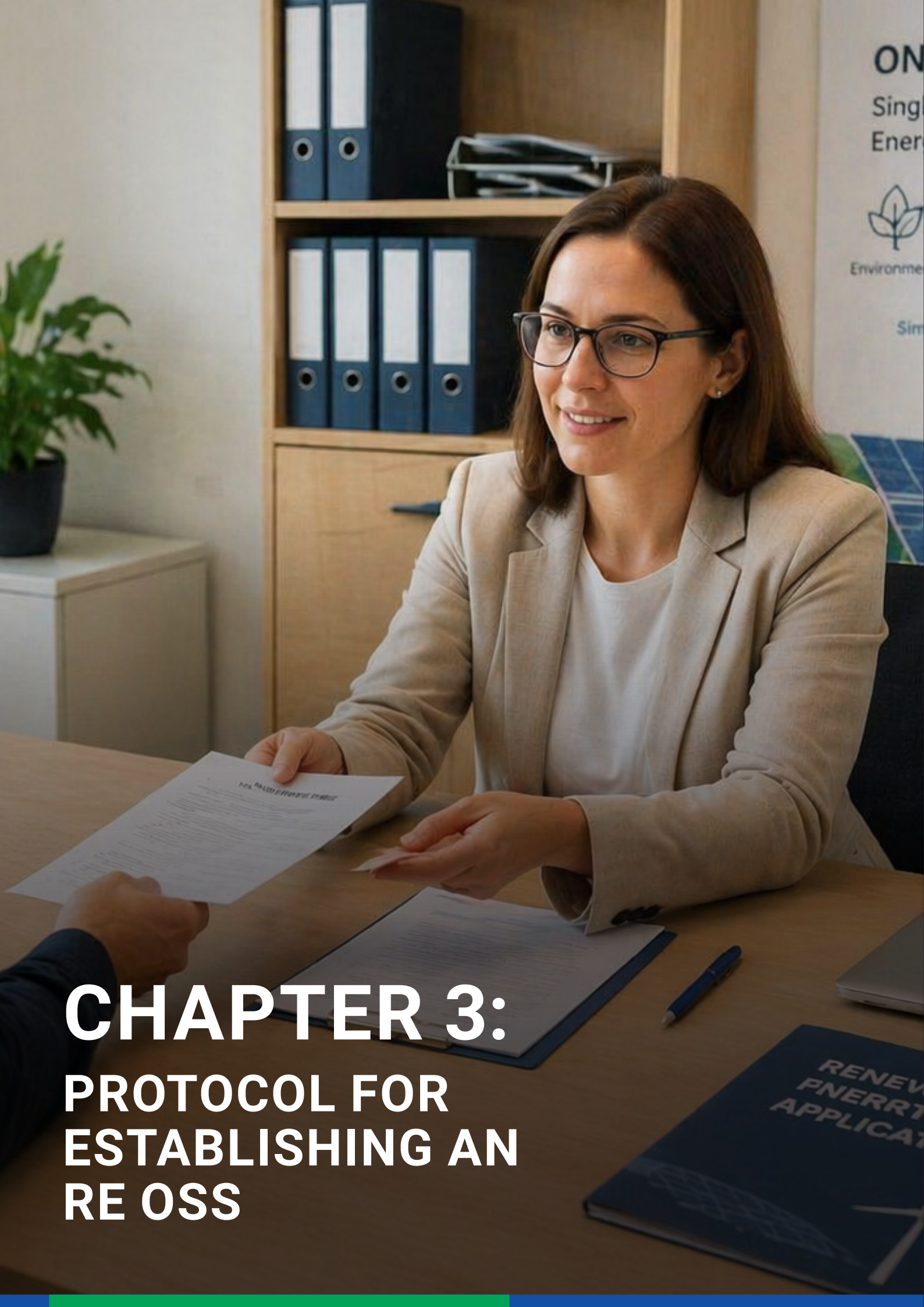
This way, the authorities engaged in the permitting process could meet tight deadlines that the revised RED specifies. For example, the 30-day EIA screening deadline is realistic only if competent authorities are familiar with the specific sensitivities of the designated RAA, understand the environmental impacts associated with different technologies and can verify the mitigation measures required to avoid or, where necessary, significantly reduce adverse effects.

To facilitate this the OSS can host and manage interactive maps of the designated RAAs on its digitalised platform, along with interactive GIS layers showing zones protected under national and international law, land classification (e.g. agricultural, industrial, degraded), bird migratory routes, high social value areas, nearby settlements, etc.

Developers could benefit from these maps by overlaying selected project sites with different layers helping them to anticipate possible environmental or community-related concerns before submitting a formal application. Furthermore, they can also benefit from the established mitigation rulebook by incorporating these prescribed measures into their project applications from the outset. This would reduce the risk of delays or additional mitigation requests.

For a practical example, see the case study on [Croatia's biodiversity portal](#) or read about the Denmark Environmental Desk.





# CHAPTER 3: PROTOCOL FOR ESTABLISHING AN RE OSS

**This chapter outlines the four indicative essential steps for establishing an OSS.**

The first step is to map the stages in the permit-granting procedures and applicable legislation, thus creating an overview of the regulatory environment, procedural sequences, responsibilities of competent authorities and existing administrative bottlenecks. The next step involves defining the purpose and scope of the OSS – clarifying the problem it wants to solve, which RE technology it will cover and the scope of responsibilities (whether it will function as an information portal, a coordination mechanism or integrated OSS with merit powers). Then the required resources must be assessed, both technological and human. These first three steps are preparatory steps which allow for an overview of the existing situation and desired outcome to become clear, taking into account the available resources. The chapter concludes with guidance on monitoring the OSS's performance through process metrics, monitoring mechanisms and continuous-improvement practices that ensure that the OSS remains effective, transparent and responsive to evolving regulatory requirements and user needs. These steps provide a structured pathway for creating an efficient OSS that streamlines RE permitting.

### 3.1. Mapping and analysing the existing permitting and legal framework for contact points

The primary objective of this step is to gain a comprehensive understanding of how the RE permitting system operates within a specific jurisdiction, to identify potential bottlenecks and application backlogs and to assess whether, and if yes, which internal process improvements have been implemented. The step should result in a comprehensive overview of the permitting process, encompassing its procedural steps, institutional and technological setup and the legal framework regulating permitting.

#### 3.1.1. Assessing permit-granting procedure in practice

In order to identify regulatory bottlenecks and structural barriers, the assessment should first map all necessary permits and procedural steps for specific technologies, duration of procedures, number of applications, number of incomplete applications, documents that need to be submitted, alignment with statutory requirements, etc.

Ultimately, this can lead to aligning requirements, removing duplicative steps or unnecessary permits, harmonising procedures and timelines and making the guidelines clear to interested parties. Table 3 illustrates key permits typically required for wind turbines in Germany.<sup>71</sup>

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71 Niklas Meyer, Guidelines for Onshore Repowering Germany, Educational Journal of Renewable Energy Short Reviews (2025\_04).

**Table 3:** Key types of permits typically required for wind turbines in Germany

Permit/Assessment	When required
Immission Control Permit (BImSchG)	Turbines >50 m;
Regional/Municipal Planning (LROP, §35 BauGB)	Always
Building Permit (NBauO)	Turbines <50 m
Environmental Impact Assessment (UVPG, BImSchG)	Wind farms >3 turbines >50 m; as applicable
Nature Conservation Permit (BNatSchG)	If protected species/areas are affected
Water Law Permit (WHG, NWG, AwSV)	Near water protection zones or water bodies
Monument Protection Approval Aviation Clearance (FStrG, Luftverkehrsrecht, EBA)	Near protected cultural/historic sites
Aviation Clearance (FStrG, Luftverkehrsrecht, EBA)	Near airfields/airports/flight paths
Noise and shadow flicker assessments (BImSchG, TA Lärm)	Always
Distance and safety assessments (BauGB, DIBt, NBauO)	Always
Fire protection and safety review (DIN 14095)	Always
Soil, groundwater, and waste management (WHG, NWG, AwSV)	Always



This step involves comprehensively outlining every permit, licence, approval and procedural step necessary to build and operate RE plants under applicable national legislation, along with conditions that must be met and documents that need to be submitted so that permits are issued. For this purpose, the administrative registers and records should be assessed to document key information, such as the start date of each application (typically recorded upon submission) and the duration of each procedural step. It should also verify whether the register allows for

disaggregation of RE projects – for example, distinguishing wind, solar and other types of RE generation plants, as well as storage projects, from broader energy categories.

Table 4 below presents an overview of the processes for issuing building permits in jurisdictions in the EU.<sup>72</sup> Similar lists can be created for RE projects to understand the entire process from the pre phase to submission of the application and its review to the issuing of a final decision.

**Table 4:** An overview of the processes for issuing building permits

Processes	Definition
<b>Pre Phase</b>	
<b>Pre consultation</b>	<b>Giving advice by the building control authority before an application is submitted.</b>
<b>Review Phase</b>	
<b>Submission</b>	<b>The submission of a building application where different conditions and requirements needs to be considered.</b>
<ul style="list-style-type: none"> <li>Confirmation of receipt of application</li> </ul>	<ul style="list-style-type: none"> <li>The receipt of the building application is confirmed.</li> </ul>
<b>Administrative check</b>	<b>An administrative process comprising confirmation of receipt, registration, and checking of the completeness of the submission.</b>
<ul style="list-style-type: none"> <li>Preliminary review</li> <li>Registration of application</li> <li>Check/request payment of taxes and fees</li> </ul>	<ul style="list-style-type: none"> <li>Review of the submitted documents including completeness check of documents, and information required.</li> <li>Registering of the building application.</li> <li>Request for payment (this process can also occur in the issuance of the notification letter)</li> </ul>
<b>Assignment (to plan checker)</b>	<b>Passing on an operation or content review.</b>
<b>Participation of other agencies</b>	<b>Participation of other involved agencies, local authorities and any specialist authorities (for ancillary construction law), utility companies, and other experts.</b>
<ul style="list-style-type: none"> <li>Public agencies participation</li> <li>Private agencies participation</li> <li>Internal referral department participation</li> <li>Involvement of review board</li> </ul>	<ul style="list-style-type: none"> <li>Involvement of public agencies outside the building permit authority and outside the municipality (e.g., agencies on national level).</li> <li>Involvement of public agencies (e.g., utility supplier, private consultants and experts for technical reports)</li> <li>Involvement of departments in the same municipality/county/others as the building permit authority.</li> <li>Involvement of specific or specialized boards to give statements (e.g., design or heritage review).</li> </ul>
<b>Participation of public</b>	<b>Participation of interested or concerned people that is essential for promoting transparency, inclusivity, and informed decision-making</b>
<ul style="list-style-type: none"> <li>Neighbour participation</li> <li>Public inquiry</li> </ul>	<ul style="list-style-type: none"> <li>Participation of the affected neighbors (e.g., neighbors sharing a border, affected by emissions).</li> <li>Participation of the entire public (e.g., announcement, hearing).</li> </ul>

<sup>72</sup> Fauth, J., Nørkjær Gade, P., Kaiser, S., Raj, K., Goul Pedersen, J., Olsson, P. O., ... Tekavec, J. (2025). Investigating building permit processes across Europe: characteristics and patterns. *Building Research & Information*, 53(4), 417–434.

## Processes

## Definition

## Review Phase

**Content check**

- Planning/zoning review
- Building/technical review
- Committee meeting
- Internal discussion

**The examination of the submission against substantive planning and building law**

- Examination against planning and zoning requirements
- Examination against building and technical requirements
- A committee reviews the application and is responsible for the final decision
- Consultations within the building permit authorities (on demand, on periodical basis, etc.) with colleagues or supervisors

**Issuing notification letter**

- Completing documentation
- Request further documentation
- Issuance of construction certificate

**The issuance of the decision as to whether a project is eligible for a building permit or license to occupy and any possible enforcement action.**

- Complete the case file with all necessary information and decisions (including conditions)
- Complete the case file with all necessary information and decisions (including conditions)
- Issuance of a separate approval to start the construction work

## Post Phase

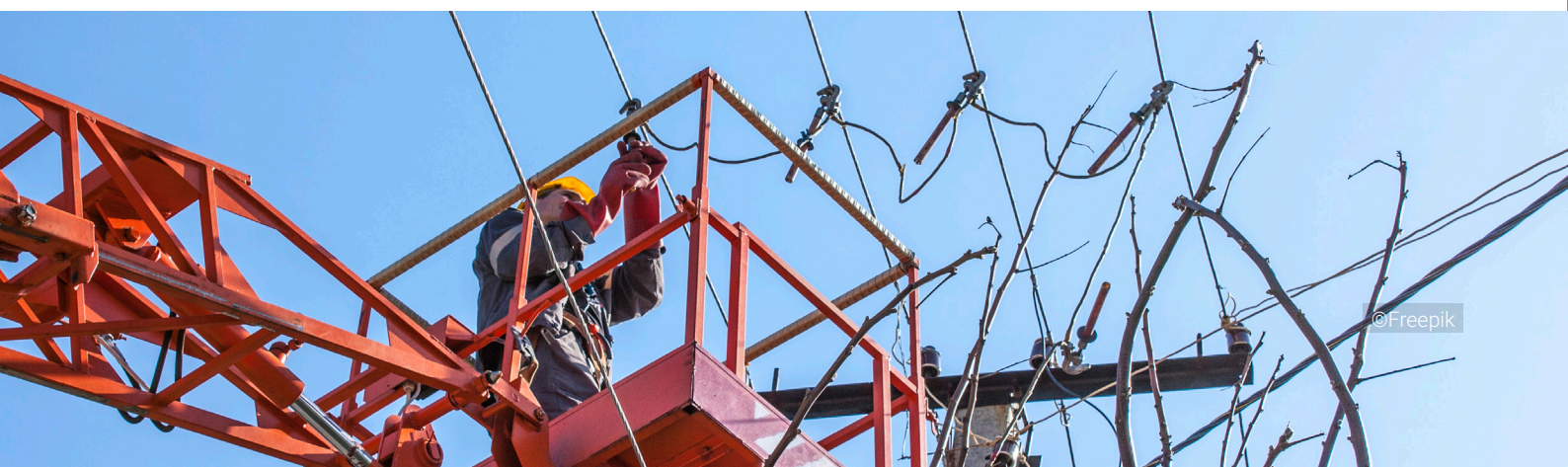
**Inspection****Checks on the building in construction and/or use for compliance to the legal regulations and/or the building design as submitted (can be differentiated in inspection supervision (legal aspects) and engineering supervision (engineering standards))**

In addition to reviewing the procedural steps and the volume of applications, it is essential to assess the current workforce responsible for processing these applications. This includes identifying the staff involved in the permitting process, clearly defining their roles and responsibilities, and mapping points of contact across the relevant institutions. Furthermore, it is necessary to examine whether any bodies and/or digital platforms with functions equivalent to an RE OSS are already in place. Where no such RE OSS exists, the analysis

should evaluate which existing institutions involved in RE matters could potentially assume the roles and responsibilities of an RE OSS, taking into account their mandates, capacities and level of coordination.

Finally, it is important to perform analysis of lessons learned and success factors from previously implemented RE OSS initiatives across Europe by conducting desk research and interviews with selected initiatives.<sup>73</sup>

<sup>73</sup> H2020 project UP-STAIRS, Design of UP-STAIRS Energy Service OSS Framework Deliverable 2.2 - WP2, April 2021.



## Checklist for assessing and monitoring of records of applications

### ✓ 1. Identify and Access Registers

Locate all administrative registers where permit applications are recorded.

Verify whether registers are digital or paper-based and confirm accessibility.

### ✓ 2. Record basic application data

For each permit application, check that the following fields are captured:

- Start date: when the application is submitted.
- Type of application: e.g., construction, grid connection, storage, or other RES-specific projects.
- Applicant type: citizen, business, energy community, etc.
- Assigned staff or unit handling the application.

### ✓ 3. Verify RES-specific disaggregation

Check whether the register allows identifying renewable energy projects separately.

- Is it recorded as RES specifically or lumped under “energy projects”?
- Does it distinguish between different technologies, and storage projects?

Note any limitations or gaps in categorization.

### ✓ 4. Track Procedural Steps and Timelines

For each application, record the duration of each step:

- Submission → validation → review → decision → notification.

Identify whether timestamps are automatically recorded or need manual extraction.

### ✓ 5. Gather Workload and Staffing Data

For each type of application, collect information on:

- Number of applications handled per year.
- Number of staff assigned per step/type of application.
- Average processing time per staff member or per unit.

### ✓ 6. Identify Barriers or Bottlenecks

Compare recorded timelines with legal deadlines or expected processing times.

Identify steps with frequent delays or multiple handovers.

Note where missing data or lack of disaggregation prevents full analysis.

### ✓ 7. Summarize Findings

Produce a table or dashboard showing:

- Permit type vs. average processing time
- Staff allocation vs. workload
- Points of coordination or handovers
- Data gaps or reporting limitations

Highlight opportunities for OSS to streamline procedures and improve coordination

### 3.1.2. Assessing legislative and institutional frameworks

#### Assessing legislative and institutional frameworks involves cataloguing legislative acts and authorities that:

1. govern permit-granting procedures for RE projects and
2. impact the establishment and operation of RE OSSs.

The foundation for deciding on necessary legislative amendments and deciding on the purpose and scope of the RE OSS is based on comprehensive analysis and understanding of the particularities of legislative frameworks for permit-granting procedures and the authorities involved in it, as well as analysis of the general framework for administrative procedures.

#### With regard to the first set of frameworks, all laws affecting the project development lifecycle should be analysed.

First, laws and bylaws governing the organisation of the energy market are directly relevant to the permitting of RE projects, as they define the procedures for developing, connecting and operating energy facilities. In some cases, legislation specific to RE serves as *lex specialis*, regulating these matters in more detail and therefore taking precedence over the general energy law. In terms of the grid connection procedure, transmission and distribution system operators issue technical conditions, provide opinions on the feasibility of the connection and ultimately grant approval if all technical requirements are fulfilled. These procedures are governed not only by the primary legislation but also by a range of bylaws and technical regulations adopted by network operators and approved by national regulatory authorities (NRAs) for energy. Finally, bylaws regulating the granting of operational licences, usually issued by NRAs for energy, should be analysed.

An analysis of legislation governing spatial planning and land use, as well as the relevant spatial planning documents, is necessary to assess how the permitting procedures could be simplified and potentially integrated. Laws and bylaws regulating the construction of facilities should be analysed in order to assess whether and for which types of objects a construction permit is required and whether and which types of RE plants and storages are defined in the law. The aim is to identify possibilities for simplifying or rationalising the applicable requirements and conditions as well as to align with the EU renewables acquis.

Legislation governing different environmental assessments and the issuance of related environmental approvals should be assessed, as it is explained in the first chapter.

#### The majority of RE projects, and especially hybrid ones integrating co-located storages – particularly lithium-based ones – typically need to secure:

- a fire-safety permit,
- a hazardous-materials handling permit and
- hazardous-waste generation authorisations.

A fire-safety permit ensures that the battery energy storage system complies with applicable fire-protection standards. Because lithium-based batteries are classified as hazardous materials, a hazardous-materials handling permit is usually required to authorise on-site storage, define safety measures for installation and operation and ensure proper labelling and containment of battery modules. Typically, checks to ensure that equipment meets fire safety standards are carried out as part of the licensing process. At the end of their operational life, batteries become hazardous waste, meaning that developers must also comply with national and international<sup>74</sup> requirements on waste-generation, temporary storage and transport. Therefore, the relevant fire-safety and hazardous-materials regulations and hazardous-waste management laws must be reviewed to obtain these permits.

While specific laws regulate individual permits that must be issued, it is also important to analyse the law governing the general administrative procedure, as all permits are granted through administrative procedures and are therefore subject to that law. Specifically, provisions concerning tacit approval, appeal and judicial review of administrative decisions and the use of ADR mechanisms (e.g. ombudsman, mediation, pre-litigation settlement) in administrative procedures need to be analysed, since they may directly impact the duration of permitting procedures. When tacit approval is envisaged in administrative laws, it should be applied to accelerate permit-granting procedures for projects within RAAs and solar energy projects as envisaged in the revised RED.

<sup>74</sup> UNECE, ADR 2023 - Agreement concerning the International Carriage of Dangerous Goods by Road.

Finally, laws and bylaws regulating access to information of public importance are relevant for RE permitting because they ensure the transparency of the permitting process.



The table below lists specific laws that should be analysed and potentially amended, as well as authorities involved

in the permit-granting procedure. The list is intended for illustrative purposes only and does not represent an exhaustive or comprehensive overview. It is meant to serve as inspiration and may need to be adapted or expanded based on the specific legal, institutional and procedural framework.



**Table 5:** Mapping legislation and authorities relevant for RE permit-granting

Legal Category	Relevant Laws (non-exhaustive)	Authorities
	<p><b>Laws concerning energy permits, operational licences and connection permits/agreements</b></p> <ul style="list-style-type: none"> <li>→ Law and bylaws regulating energy</li> <li>→ Law and bylaws regulating renewable energy sources</li> <li>→ Law and bylaws regulating electricity market</li> <li>→ Laws, bylaws and technical standards and rulebooks regulating grid connection</li> <li>→ Laws, bylaws and technical standards and rulebooks regulating the issuance of licences for energy generation</li> </ul>	<p>Ministry in charge of energy, TSOs, DSOs, national regulatory authorities for energy, industry association, chamber of commerce</p>
 <p><b>Specific Laws Regulating Permitting</b></p>	<p><b>Laws concerning construction and usage permits, land use/ zoning approvals</b></p> <ul style="list-style-type: none"> <li>→ Laws and bylaws regulating land use and spatial planning and national, regional and local decisions and spatial plans</li> <li>→ Laws and bylaws regulating construction</li> <li>→ Laws and bylaws regulating mining and geological exploration</li> <li>→ Law and bylaws regulating public property</li> <li>→ Laws and bylaws regulating expropriation</li> <li>→ Laws and bylaws regulating agricultural land</li> </ul>	<p>Ministry in charge of construction and spatial planning, agriculture, institutes in charge of cultural heritage, regional and local government units</p>
	<p><b>Laws concerning environmental assessments</b></p> <ul style="list-style-type: none"> <li>→ Law and bylaws regulating EIA</li> <li>→ Law and bylaws regulating SEA</li> <li>→ Law and bylaws regulating nature protection, protection of habitats and birds</li> <li>→ Law and bylaws regulating water management and protection</li> <li>→ Laws and bylaws regulating cultural heritage</li> <li>→ Laws and bylaws regulating waste management</li> <li>→ Rules and procedures ensuring compliance with the Aarhus Convention</li> </ul>	<p>Ministry in charge environmental protection, and other public bodies relevant for environmental assessments (e.g. Agency for environmental protection, or regional or local authorities), citizens, communities and civil society organisations as participants in public consultations</p>

Legal Category	Relevant Laws (non-exhaustive)	Authorities
 <p><b>Specific Laws Regulating Permitting</b></p>	<p><b>Safety-related Laws</b></p> <ul style="list-style-type: none"> <li>→ Law and bylaws regulating the usage, transport and disposal of hazardous materials</li> <li>→ Law and bylaws regulating fire safety requirements</li> <li>→ Law and bylaws regulating air traffic</li> </ul> <p>Consider all relevant valid EU acquis, particularly those relate to electricity market, renewable energy, and environment.</p> <p>Even though some EU acquis is still not part of the Energy Community acquis, such as revised RED or Habitats, Birds and Water Framework directives, early harmonisation with the EU acquis is recommended.</p>	<p>Ministry in charge of environment, waste and fire protection</p>
 <p><b>Administrative Procedure</b></p>	<p><b>Law on General Administrative Procedure</b></p> <ul style="list-style-type: none"> <li>→ Rules on tacit approval</li> <li>→ Provisions on appeal and judicial review rights</li> <li>→ Provisions on use of ADR mechanisms</li> </ul> <p><b>Law on access to information of public importance</b></p>	<p>Local, regional and national authorities who govern permit-granting procedures</p>



With regard to the set of legislative and institutional frameworks that impact the establishment of an OSS, it is necessary to examine whether the existing law governing administrative procedure provides a legal basis for establishing contact points or similar cooperation between state organs. This assessment will determine whether the current provisions allow for procedural coordination among multiple authorities, the delegation of tasks or the consolidation of steps into a unified application process. If the administrative laws do not contain such provisions, a special bylaw or other legal act regulating the establishment of an RE OSS should introduce a legal basis for setting up an OSS and coordination with permit-granting authorities.

In addition, the review should cover other legal acts that do not directly regulate administrative procedures, but which may have implications on the functioning of an RE OSS. This could include laws regulating electronic processing of documents and agreements,

data protection and access to information of public importance. It is necessary to assess national e-government laws regulating matters such as electronic signatures, digital identification, electronic records, online submissions, standardised templates and digitally generated agreements and decisions. This will ensure that all permits, licenses and approvals issued through an RE OSS platform carry full legal effect. In this regard, cybersecurity regulations and data protection and privacy laws are essential to ensure that the RE OSS platform safeguards all digital submissions, prevents data breaches and maintains the integrity and confidentiality of permitting records. Intellectual property rights also play a significant role, particularly where applications involve patented technologies, copyrighted project documentation or trademarks.

The table below lists provisions of the laws regulating general administrative procedure, as well as other laws relevant for setting up and operating an RE OSS.

**Table 6:** Mapping legislation and authorities relevant for setting-up and operating an RE OSS

Legal Category	Relevant Laws (non-exhaustive)	Authorities
 <p><b>Administrative Procedure</b></p>	<p><b>Law on general administrative procedure</b></p> <ul style="list-style-type: none"> <li>→ Provisions enabling a single contact point</li> <li>→ Provisions on coordination between administrative authorities</li> <li>→ Mechanisms for procedural consolidation or delegation of tasks</li> </ul>	<p>Ministry in charge of public administration, local, regional and national authorities who govern permit-granting procedure</p>
 <p><b>Other Relevant Laws</b></p>	<ul style="list-style-type: none"> <li>→ Law and bylaws regulating electronic communications, digital contracting, contract templates and automated approval systems</li> <li>→ Law and bylaws regulating data protection and privacy</li> <li>→ Law and bylaws regulating business secrecy</li> <li>→ Law and bylaws regulating Intellectual Property Rights</li> <li>→ Law and bylaws regulating cybersecurity</li> </ul>	<p>Authorities in charge of digitalisation, creators and managing authorities of existing OSS platforms, broader digital public administration systems</p>

### 3.2. Defining the goal and scope of an RE OSS

After the initial mapping exercise and identification of challenges in the permitting procedure, authorities should define the objective for establishing an RE OSS.

**When defining the scope, and in light of the explanations set out in Chapter 2, authorities should carefully determine the scope of the RE OSS, with regards to the following:**

1. responsibilities of the OSS,
2. technology and size of projects that the OSS will serve and
3. administrative level that has the capacity and legitimacy to establish the OSS.

#### Good governance principles integrated in the work of RE OSS

While the scope should be carefully delineated before establishing an RE OSS, applying good governance principles – transparency, accountability, efficiency and public participation – throughout the work of the RE OSS is necessary in order to achieve set objectives. Transparent, accessible information enables developers to understand permitting requirements, track application progress and access relevant contacts and legislation. This reduces uncertainty and improves the overall experience. Accountability is ensured through setting defined timelines for processing applications and promptly addressing delays, with clear communication to applicants about any issues or resolution plans. Efficiency is central to the OSS's role and to minimising administrative burdens through streamlined workflows and digital platforms that consolidate procedures and accelerate approvals. The OSS can facilitate public involvement by engaging communities and hosting public consultations, thereby addressing concerns and contributing to public acceptance of renewable energy.

### 3.3. Resource assessment and setting up the system

A resource assessment should start with a cataloguing of all necessary inputs for the OSS's successful operation, including human resources, technological infrastructure, office space and administrative support. These should then be translated into a detailed budget that distinguishes between one-time startup costs (such as digital platform development) and recurring expenses (such as maintenance, salaries and outreach activities). Regular reviews will allow financial planning to adapt to evolving operational demands and available funding.

Depending on the objective and scope of the RE OSS, the infrastructure setup will usually involve establishing a digital platform and a physical office, if needed.

Digital platforms should enable electronic submission of documents and their review by competent authorities responsible for processing the applications. Efficient digital platforms can be used simultaneously by all authorities involved in the permit-granting procedure. Digital platforms can be combined with AI tools for data validation in electronic submissions to instantly flag incomplete applications and missing documents, ensuring applicants can promptly address issues. Moreover, the digitalised platform should provide real-time status updates, allowing stakeholders to track progress and address any issues proactively. It can also facilitate communication through integrated messaging or incorporate notification systems for approaching deadlines.

The platform could also integrate advanced functions

such as automated checks of zoning and land-use compliance and cross-referencing proposed project sites with existing spatial plans to quickly verify whether a location meets regulatory requirements. Geospatial layers could automatically flag environmental constraints by presenting areas with sensitive species and habitats. The integration of such tools should be aligned with the EU's INSPIRE Directive and broader digitalisation objectives.<sup>75</sup>

As local authorities often lack experience with new technologies, national authorities play a key role in providing training and guidance to build their capacity, as described in the case study on Denmark in Annex 1.

An OSS might either utilise existing agencies or platforms or create a new one. Leveraging existing institutional structures can offer significant cost and time efficiencies, as it allows authorities to use established administrative processes, IT systems and staff expertise, thereby enabling faster implementation and reduced upfront investment. However, this approach may be constrained by legacy procedures or limited flexibility in adapting existing mandates.

By contrast, creating a new entity allows for a clearly defined and specialised focus on RE permitting, which enables tailored processes, dedicated staffing and the design of digital tools specifically suited to the needs of project developers. While this option may require greater initial resources and longer setup times, it can provide stronger coordination, clearer accountability and greater long-term efficiency in managing RE project development.

<sup>75</sup> Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE).



If the OSS functions as a permitting authority, the RE OSS team must have the expertise to evaluate applications in depth, assess compliance with multiple regulatory frameworks and make informed decisions on granting permits. Such a team should include environmental scientists to assess impacts on ecosystems, biodiversity, water resources and land use, as well as RE specialists who provide technical insights into the feasibility, efficiency and safety of proposed projects. Legal and regulatory experts are essential to ensure that applications comply with national laws, EU directives and local planning regulations. If the RE OSS operates solely as a coordinating body, experts from competent authorities will be in charge to review the application thoroughly and decide on its merits. In both scenarios, the issue of understaffing should be addressed by ensuring that an adequate number of experts are involved in reviewing applications. Administrative and project management staff play a role in both coordinating and permitting model of OSS, ensuring permitting procedures operate efficiently and effectively by tracking deadlines, coordinating and maintaining communication with developers and other authorities.

In the assessment of staffing needs, the expected volume and complexity of projects should be taken into account.

For instance, where a high volume of applications for a particular type of RE permit is expected each year, and each requires substantial processing time, a dedicated team of full-time staff will be necessary to process the files. Additionally, a reasonable buffer should be included to accommodate absences and unexpected increases in workload, ensuring smooth and continuous operations.

For example, if a total of 56 environmental screening procedures were carried out, with an average completion time of approximately seven months per screening<sup>76</sup> (assuming that each screening typically requires an estimated 80-120 working hours per month for technical review, inter-agency consultations and coordination with project developers), the total effort for all 56 screenings amounts to approximately 31,000-47,000 working hours, which corresponds to roughly 18-27 full-time equivalent staff over the period.

In another example, if each EIA screening requires around 120 hours of processing per month over an assessment period of seven months, this amounts to approximately 840 hours per application. If 10 applications are expected per year, this would require about 8,400 working hours annually, equivalent to around 4-5 full-time staff dedicated to permit processing.<sup>77</sup>

To evaluate the maturity of digital RE permitting systems in a comprehensive and detailed manner, maturity models offer structured frameworks for assessing an organisation's capabilities and for guiding systematic, incremental improvements across key dimensions. The CHEK DBP Maturity Model (CDBPMM)<sup>77</sup> is one such tool, designed to assess the readiness of public authorities to digitally transform building permitting processes across process design, organisational structures, technological infrastructure and information management. This model may also be applied, with appropriate adaptation, to assess the maturity of permitting systems for RE plants, thus providing valuable insights into current capabilities and areas for improvement.

<sup>76</sup> [Duration of the environmental impact assessment process and comparative development of renewable energy technology Energy community, 25th meeting of the Environmental Task Force.](#)

<sup>77</sup> [Change toolkit for digital building permit, October 2023.](#)

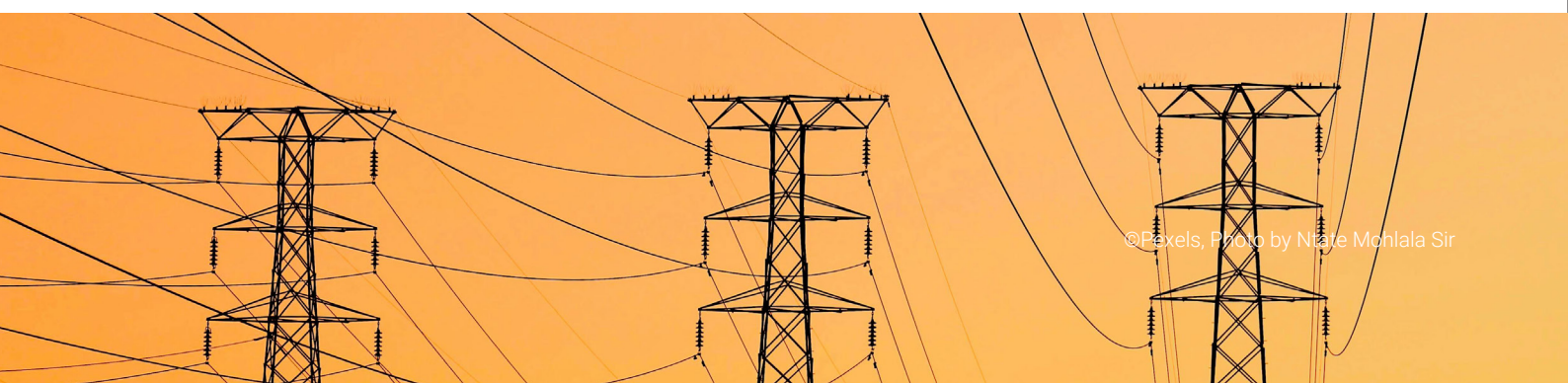









Table 7 sets out a matrix that identifies key inputs needed to evaluate available resources aiming to determine their suitability for establishing an RE OSS and required actions.

**Table 7:** Available resources assessment

Resource Category	Key Inputs Needed	Purpose / Function	Current Status (Example)	Gaps Identified	Actions Required
 <b>Human Resources</b>	Administrative support, permitting experts, legal advisors, IT staff	Record and process applications and provide technical expertise	Limited staff with uneven expertise	Staff shortages, skills gaps, processing delays	Recruit additional staff, targeted training
 <b>Training &amp; Capacity Building</b>	Continuous training programmes, onboarding materials	Build capacity and support reforms	One-off trainings	Insufficient ongoing capacity-building	Implement continuous training programme
 <b>Office Space &amp; Facilities</b>	Offices, meeting rooms	Support operations and stakeholder engagement	Centralised national office	Limited regional accessibility	Set up offices or shared facilities
 <b>Coordination &amp; Governance</b>	Inter-agency agreements	Clarify roles and support cooperation	Informal coordination	Unclear responsibilities	Formalise coordination mechanisms
 <b>Technological Infrastructure</b>	Digital OSS platform, document management system, secure data storage	Enable online submissions and application tracking	Partially digitalised	Lack of system integration	System integration
 <b>Communication with Applicants</b>	Helpdesks, guidance materials, training sessions	Improve transparency and application quality	Limited guidance available	High number of incomplete applications	Establish helpdesk, publish guidance, hold workshops
 <b>Monitoring &amp; Performance Management</b>	KPIs, reporting and tracking tools	Monitor timelines and identify bottlenecks	No systematic monitoring	Lack of performance data	Introduce KPIs, monitoring and reporting framework

### 3.4. Performance monitoring

Once an RE OSS is established and operational, it is important to implement a system for continuous monitoring and improvement. For this purpose, an indicators matrix should be defined to assess the efficiency and overall performance of permit-granting procedures.

**Key Performance Indicators (KPIs) should capture essential metrics reflecting the requirements of the EU renewables acquis and beyond. These include the time required for screening and processing, the number of permits issued, the number of positive and negative decisions, the number of applications per type of technology, the number of returned applications to be completed, etc.** Accordingly, process effectiveness can be measured using indicators related to time, volume and success rates.

Time-related KPIs track the duration of the process, and each stage within it, with the goals of comparing actual performance against established deadlines and identifying recurring delays. These KPIs measure key milestones, such as when an application is officially received, when documents are verified and forwarded to the competent authority or officer and when final decisions are issued.

Volume KPIs quantify the workload handled by the OSS by tracking the number of permit applications received and processed within a specific timeframe, such as monthly, quarterly or annually. These indicators help assess the efficiency and capacity of the permitting system while identifying trends in RE project approvals. For example, for a local OSS that assesses small-scale projects, a volume KPI may set a target of processing 100 permit applications quarterly. To gain deeper insights, the processed applications can be further categorised by applicant, for example, citizens: 60 applications (60%), businesses: 30 applications (30%) and energy communities: 10 applications (10%). Most importantly, the KPI tracks compliance with statutory deadlines, both interim steps (e.g., screening) and final decisions (e.g., permit issuance) and, when delays occur, helps identify the underlying causes, such as

insufficient staffing, unclear guidance or disproportionate documentation requirements.

Success rate KPIs track the proportion of applications that are approved, returned for corrections or rejected, as well as processed within the statutory timeline. For example, an analysis may show 70% of applications approved, 20% returned for revisions and 10% rejected.







Such time, volume and success metrics should be established specifically for projects within RAAs. Recommended indicators include number of permits issued and corresponding timeframes for permitting in designated RAAs, the number of positive and negative decisions, as well as the number of projects that are rerouted after consultations.

An important performance indicator is stakeholders' satisfaction. This measures the extent to which the permitting process meets the expectations and needs of all relevant parties, including applicants, concerned members of the public, regulatory bodies and internal staff. It captures perceptions of fairness, transparency, efficiency and the quality of interactions throughout the process. This KPI can be assessed using surveys, feedback forms, dedicated workshops and digital comment platforms providing both quantitative and qualitative insights.

**By monitoring these metrics, an OSS can gain insights into additional support needs for certain applicants, enhance guidance and establish dedicated assistance for those whose applications are rejected.** Monitoring also allows authorities to observe broader trends, such as an increase in RE installations, shifts in applicant types or recurring bottlenecks in the permitting process. Finally, it is important that these metrics are regularly reviewed and updated to reflect evolving best practices and ensure continuous improvement of the OSS's performance.

The table 8 below provides a monitoring matrix that reflects the main KPIs described above.

Table 8: Monitoring matrix

KPI Category	Indicator	Definition / Measurement	Frequency of Monitoring	Target / Benchmark	Status (example)	Trend (example)
 Time	Average processing time per permit	Total time from submission to decision (in days/weeks)	Monthly / Quarterly	≤ statutory deadline	●	↑
	Time per procedural step	Duration of each step (submission → validation → review → decision → notification)	Monthly	≤ step-specific standard	●	→
	Time for acknowledgment of completeness	Duration of assessment of completeness of the application	Monthly / Quarterly	≤ statutory deadline of 45 days (outside RAAs) and 30 days (in RAAs)	●	↑
 Volume	Number of applications received	Total number of permit applications submitted	Monthly	Trend tracking vs. previous period	●	↑
	Number of applications processed	Total number of permits issued/decided	Monthly	≥ 95% of received applications processed	●	→
 Success / Quality	Permit approval rate	% of applications successfully approved vs total received	Monthly	≥ 90%	●	↑
	Completeness of applications	% of applications submitted with all required documents	Monthly	≥ 95%	●	↓
	Compliance with legal timelines	% of permits issued within statutory deadlines	Monthly	100%	●	→
 Bottlenecks / Efficiency	Number of delayed applications	Applications exceeding expected processing time	Monthly	Minimise / trend downward	●	→
	Staff workload per application	Hours spent per application per staff member	Monthly	Within planned staffing capacity	●	→
	Number of applications submitted electronically	Applications for RE permitting submitted through digitalised platform	Monthly	100%	●	↓
 OSS facilitation services	Tacit approval	Institutions using a tacit approval principle	Quarterly/ yearly	Trend tracking vs. previous period	●	→
	Number of requests for facilitation or advice	Requests of RE developers for guidance and facilitation throughout the permit-granting procedure	Monthly	Trend tracking vs. previous period	●	→
 Settlement of disputes	Number of requests for ADR	Out of court procedures initiated in relation to RE-related dispute	Quarterly/ yearly	Trend tracking vs. previous period	●	→
	Number of judicial or administrative procedures	Judicial or administrative procedures initiated in relation to RE-related dispute	Quarterly/ yearly	Trend tracking vs. previous period	●	→



# CHAPTER 4: CONCLUSIONS

**Despite progress made in individual jurisdictions, the permitting procedures for RE projects continue to be lengthy and complex, constituting a key barrier to the accelerated deployment of RE.** In this context, the RE OSS is recognised in EU legislation and policy documents as an important instrument to strengthen coordination among competent authorities and to contribute to more efficient permit-granting processes.

The role and responsibilities of designated contact points have progressively evolved in the RE acquis, from primarily functioning as an informational guide into taking over a stronger coordination role. The revised RED further introduces a differentiated and technology-specific permitting framework, including tailored permitting timeframes, exemptions from environmental assessments in certain cases, mandatory digitalisation and concepts such as RAAs, tacit approval and overriding public interest. Taken together, these measures are intended to accelerate RE deployment.

Importantly, the permitting framework in the revised RED is closely linked to the EU environmental acquis, in particular with EIA and SEA Directives and Habitats, Birds and Water Framework Directives. Their effective transposition and implementation are therefore of significant value for the proper implementation of the permitting framework.

Against this background, the present targeted guidance has been developed to support the effective and consistent implementation of the RE acquis requirements. It builds on the Permitting study and Permitting guidelines mandated and developed by the ECS, as well as the Operational Blueprint developed in cooperation with The Nature Conservancy.

The establishment of an RE OSS should be based on a comprehensive assessment of existing permitting processes, a clear definition of objectives and the identification of appropriate institutional and procedural models.

Given the diversity of institutional arrangements across jurisdictions, the design and implementation of OSS structures should be adapted to national circumstances and existing solutions. The minimum requirements from the RE acquis must be met, meaning that OSSs should perform guiding and facilitating functions and be responsible for monitoring compliance with permitting deadlines. Additional features, such as organising networking events, providing information on support schemes, offering interactive maps covering RAAs, mitigation rulebooks, biodiversity-rich areas and grid hosting capacity can further support developers and investors in preparing high-quality projects at early development stages.

Furthermore, regular monitoring and evaluation of implemented reforms are essential for assessing their effectiveness and ensuring continuous improvement of permitting frameworks in line with the EU acquis. Finally, practical solutions already implemented in Member States have been provided below to inspire CPs in implementing similar solutions.

**Overall, the establishment of RE OSSs across CPs represents a strategic enabler for faster RE deployment, as it simplifies complex permitting processes and increases confidence among investors and local communities.**



## Annex 1 – Case studies

### Case study 1 – Borzen, the Slovenian contact point for renewable energy

In Slovenia, an electricity market operator Borzen operates as a national contact point for promoting the use of RES.<sup>78,79</sup> Its main responsibility is to guide investors through all administrative procedures for obtaining permits for construction, repowering or operation of an RE facility and its connection to the grid. In addition to general guidance, investors have access to individual, tailored counselling<sup>79</sup> and free advisory services from a network of consultants.<sup>80</sup> In order to apply for counselling, investors create a user account on the online platform and submit the required information and documentation.

Furthermore, Borzen maintains publicly accessible official records containing data on complete and incomplete permit applications that have been submitted, the stages

of their processing, including delays, and final decisions issued by competent authorities.<sup>81</sup> Competent authorities must provide Borzen with access to relevant databases and timely information on application files, procedural status, deadlines and any other data necessary for carrying out its tasks,<sup>82</sup> while Borzen ensures that exchange of applications, documents and information is as efficient as possible, provides information support and draws attention to the expiry of deadlines.<sup>83</sup>

Finally, Borzen organises seminars, publishes manuals and informational materials, and provides information on the procedures of support programmes,<sup>84</sup> service providers, consultancy offices across the country,<sup>85</sup> alternative dispute resolution mechanisms and examples of good practice.<sup>86</sup>

### Case study 2 – Danish Energy Agency as an RE OSS

In Denmark, the Danish Energy Agency (DEA)<sup>87</sup> is the designated contact point for RE developers as of 1 July 2024. This competence was established through a special Executive Order on the Contact Point, the Renewable Energy Permit Process and Areas for the Promotion of Renewable Energy. This Order transposes the revised RED

and defines the procedure, tasks and competencies of DEA in permitting procedures for RE, including in RAAs.<sup>88</sup>

As the designated contact point, the DEA guides the administrative process for renewable energy plants by providing general guidance and a comprehensive online

78 <https://borzen.si/sl-si/tocka-ove/tocka-ove>

The establishment and scope of responsibilities of the RES contact point are governed by the Regulation on the Definition of the Tasks of the Contact Point for the Promotion of the Use of Renewable Energy Sources (Official Gazette of the Republic of Slovenia, No 50/22, 122/22 and 112/25 – ZSROVE-1) (<https://pisrs.si/pregledPredpisa?id=URED8461>) and the Act on the Promotion of the Use of Renewable Energy Sources (Official Gazette of the Republic of Slovenia, No 121/21, 189/21, 121/22 – ZUOKPOE, 102/24 and 112/25 – ZSROVE-1) (<https://pisrs.si/pregledPredpisa?id=ZAKO8236>).

79 [Instructions for the operation of the contact point.](#)

80 [RES contact point, Locations.](#)

81 Article 8, Regulation on the Definition of the Tasks of the Contact Point for the Promotion of the Use of Renewable Energy Sources (Official Gazette of the Republic of Slovenia, No 50/22, 122/22 and 112/25 – ZSROVE-1).

82 Article 10(2), *Ibid.*

83 Article 51(5)(b), Act on the Promotion of the Use of Renewable Energy Sources (Official Gazette of the Republic of Slovenia, No 121/21, 189/21, 121/22 – ZUOKPOE, 102/24 and 112/25 – ZSROVE-1).

84 Article 4, Regulation on the Definition of the Tasks of the Contact Point for the Promotion of the Use of Renewable Energy Sources (Official Gazette of the Republic of Slovenia, No 50/22, 122/22 and 112/25 – ZSROVE-1).

85 [RES contact point, Locations.](#)

86 [Instructions for the operation of the contact point.](#)

87 The DEA is a part of the Danish Ministry of Climate, Energy & Utilities, established in 1976.

88 Ministry of Climate, Energy and Utilities, BEK nr 773 of 20/06/2024, Executive order on contact point, the renewable energy permit process and areas for the promotion of renewable energy, available at <https://ens.dk/energikilder/saadan-opstiller-du-et-vedvarende-energianlaeg> and <https://www.retsinformation.dk/eli/lta/2024/773>.

overview of the permits required to establish and operate such installations. While the DEA is not involved in the processing of individual applications, it offers general assistance to developers and, where necessary, refers applications to the competent authorities, indicating the appropriate application channels such as digital portals or direct contact with the responsible authority.

In its role as the contact point, the DEA is responsible for ensuring compliance with the deadlines applicable to the permitting procedures. For this purpose, the competent authorities are required to report annually on their permit processing times for renewable energy installations.

The online portal that is managed by DEA functions as an information portal for permitting procedures for both onshore<sup>89</sup> and offshore RE projects.<sup>90</sup> The procedure for each technology is described through seven steps: 1) initial consideration concerning available grid capacity, and areas where wind or solar farms may be built;<sup>91</sup> 2) issuance of a spatial plan from the municipality; 3) a permitting process that covers environmental impact assessments, construction permits and an establishment permit; 4) network connection agreement between Energinet<sup>92</sup> and the facility owner; 5) issuance of a commissioning permit from the municipality based on the competition report; 6) developers' and permitting authorities' reporting to the DEA; and 7) approval for facility dismantling.<sup>93</sup> Each of these steps contain links to relevant legislation and instructions,

online portals for submitting different applications, responsible authorities and other relevant links.

**While DEA has a coordinating role for all RE plants, it is also entrusted with carrying out the permit-granting procedure and issuing the majority of the necessary permits for installing offshore wind farms in designated zones. The permits DEA is issuing in the integrated procedure are the following:**

1. permit to carry out preliminary offshore investigations,
2. establishment permit to install the offshore wind turbines (only given if preliminary investigations show that the project is compatible with the relevant interests at sea),
3. permit to exploit wind power for a certain number of years, and
4. approval for electricity production (given if conditions in the licence to install the project are met).

Finally, DEA staff are part of the team – along with the Environmental Protection Agency and the Agency for Planning and Land Management – established to provide training concerning RE technologies to municipalities. As of June 2023, the team serves as a central contact point, offering guidance and sharing best practices through dedicated workshops and regional visits.<sup>94</sup>

Denmark established the Danish Environmental Portal which offers a range of digital solutions that give access to data on the environment, water, nature, land use and climate adaptation. It is a valuable tool, for example, in the planning and decision-making processes, as it enables permitting authorities to efficiently integrate various types of environmental data from multiple official sources. The core concept is that the state, municipalities, and regions can access information from shared databases. These databases are not only accessible to institutions, but also to businesses, NGOs, research institutions, citizens, etc. While the Danish Environmental Portal is a platform for itself, the link to it is also displayed at the website of DEA – an RE OSS.

89 The procedures for the following onshore technologies are specified: biogas plants, ground-mounted solar photovoltaic plants, wind farms, household mills, rooftop PVs, heat supply technologies, Power-to-X and other technologies.

90 Information on the establishment of renewable energy plants, available at <https://veprojekter.dk/>.

91 Spatial Map, available at: <https://www.sologvindinfo.dk/spatialmap>.

92 Energinet is an independent public enterprise owned by the Danish Ministry of Climate, Energy and Utilities which operates and develops the transmission systems for electricity and gas in Denmark.

93 Establishment and operation of solar cell systems <https://veprojekter.dk/anlaeg/solcelleanlaeg>.

94 Danish Offshore Industry. New travel team to guide municipalities on solar and wind energy on land. June 2023.

### Case study 3 – Platform for coordinated issuance of environmental and spatial decisions in the Netherlands

In the Netherlands, the Environment and Spatial Planning Act (Omgevingswet) replaced 26 legislative acts that regulated spatial and environmental matters<sup>95</sup> and simplified and integrated various environmental and planning permits into a single application through an online platform, the Environmental Desk (Omgevingsloket).<sup>96</sup>

The Environmental Desk is a joint initiative of the Ministry of Housing and Spatial Planning, municipalities, provinces and water boards. While this platform serves basic functions such as providing information on relevant regulations, it also allows for advanced functions, such as permit checks<sup>97</sup> and submission of the application for the issuance of permits.<sup>98</sup>

Through the permit check process, a user goes through several steps in order to get comprehensive information on the permitting procedure. The user begins by submitting information about the location where they intend to carry out specific activities. Next, they select the exact activity from a wide range of options, including simple building renovations, soil drainage, construction projects, or energy installations. In the third step, they respond to additional

questions, with irrelevant ones being automatically filtered out based on their previous answers. Finally, the platform generates a PDF report outlining the relevant rules and requirements for the project, specifying whether a permit is needed and, if so, which type.

When it comes to submitting applications for permits, it allows users to submit applications for issuance of spatial and environmental permits. The platform automatically routes the application to the relevant authorities based on the project's location and type. All government agencies involved (e.g., municipal, provincial or national) can access the application through the same system, allowing for centralised processing.<sup>99</sup> All requests and notifications are organised in a single overview within the project.

After submitting the application and necessary documents, the applicant receives an automated message confirming that the application is received. An authority handling the case additionally contacts the applicant to inform them that the request is under process. When an application or notification is submitted through the Environmental Desk, a decision on the permit is usually made within eight weeks, starting from the date of receipt.<sup>100</sup>

### Case study 4 – Support structures for energy communities in Austria

Austria has developed a comprehensive support framework for the establishment and operation of energy communities, combining a central national information platform with targeted regional and municipal assistance. At the national level, a dedicated online platform serves as a one-stop information hub for both newcomers and experienced stakeholders interested in collaborative, decentralised energy generation. It provides detailed explanations of the different legal and organisational models,

including Collective Energy Initiatives (*Gemeinschaftliche Erzeugungsanlagen*), Renewable Energy Communities (*Erneuerbare-Energie-Gemeinschaften*) and Citizen Energy Communities (*Bürgerenergiegemeinschaften*), outlining their structures, benefits and operational scope.

The platform supports project development through step-by-step guidance on founding and managing energy communities, covering all stages from initial planning to ongoing operation. Users have access to a

95 <https://iplo.nl/regelgeving/omgevingswet/introductie/totstandkoming/intrekken-wetten/> How the previous process of issuance permits was organised, see RES Simplify Netherlands, 2021.

96 [Environment Desk](#).

97 [Dutch Environmental Law Portal – Permit Requirement Check](#).

98 [Dutch Environmental Law Portal – Submit an Application](#).

99 [IPLD – Submit a Notification or Permit Application via Omgevingsloket](#).

100 [Dutch Environmental Law Portal – When Will You Know if You Need a Permit?](#)

wide range of practical resources, such as brochures, manuals, contract templates, association statutes and lease agreements, as well as illustrative case studies. In addition, an interactive map displays registered renewable and citizen energy communities across Austria, facilitating visibility, networking and peer learning. Further support is provided through a comprehensive FAQ section and a network of nine regional offices offering in-person consultations and tailored advice.

At the local level, Urban Innovation Vienna acts as the City of Vienna's official contact point for energy communities, providing dedicated consulting services to businesses, property owners, and organisations. The office supports

the planning, financing and implementation of renewable energy projects, promotes photovoltaic systems and energy communities, and organises information and networking events. Complementing this role, the City of Vienna has introduced the "1, 2, 3 Sonnengutschein" programme, which offers free consultancy services to residential buildings seeking to implement shared photovoltaic systems. The programme follows a structured three-step approach – feasibility assessment, decision-making support and implementation assistance – and is available to property owners, property management companies and housing cooperatives from January 2025 to March 2026.

### Case study 5 – Tools for assessing viability of PV rooftop installations

The platform for rooftop solar installations in Serbia was developed under the auspices of the ministry responsible for energy, and financially supported by GIZ (*The Deutsche Gesellschaft für Internationale Zusammenarbeit*) as a dedicated digital tool to support the deployment of small-scale solar projects. The web application includes a comprehensive database of solar installers and allows users to explore technical options

tailored to their properties, estimate installation costs and assess the potential benefits of solar energy generation. In addition, the platform provides clear guidance on the installation process, identifies qualified contractors and offers information on available financing options, thereby facilitating informed decision-making and lowering administrative and informational barriers for households and other small-scale investors.<sup>101</sup>

### Case study 6 – BioAtlas, a biodiversity database in Croatia

BioAtlas is a national open-access database for storing, sharing and analysing biodiversity data in Croatia, run by the Ministry of Environmental Protection and Green Transition.<sup>102</sup> It provides users with continuous and independent access to a wide range of information on species and their habitats. It allows users to explore species observations, taxonomic details, conservation

status, legal protection and multimedia records, as well as to conduct data analyses using integrated tools. BioAtlas aggregates validated biodiversity data from multiple sources, including from sensitivity maps for targeted species from vulnerable groups like birds, bats and large carnivores.<sup>103</sup>

