IEA Support to Accelerating Renewable Energy Permitting (ARPE)

Facilitating Spatial Planning for Renewable Energy Deployment

Hybrid workshop

10 October 2024

Den Haag, the Netherlands

Main findings

International Energy Agency

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Introduction

Workshop background

The workshop on **Facilitating Spatial Planning for Renewable Energy Deployment** was the third of a series of four events scheduled within the IEA Support to Accelerating Renewable Energy Permitting (ARPE) action. This is a project funded by the European Union via the Technical Support Instrument, which is managed by the Reform and Investment Task Force (SG REFORM) from the European Commission. The project is implemented by the International Energy Agency (IEA), in cooperation with the European Commission.

The overarching objective of the action is to assist five focus countries – Finland, Ireland, Lithuania, the Netherlands and Slovakia – in developing and implementing policy and regulatory measures aimed at **reaching their renewable energy targets**, notably through **accelerating permitting**.

In support of this objective, the IEA has organised and facilitated three workshops and a dedicated offshore wind event. The objective of these workshops is **to understand the challenges and priorities of the focus countries**, share international best practices, and offer a platform for discussion.

On 10 October 2024, the IEA Secretariat brought together experts from governments, industry, academia and regulators to discuss **international best practices and lessons learned in facilitating spatial planning** as an enabler for faster renewable energy deployment. Discussions focused on sharing strategies as well as digital tools used for identifying suitable areas for renewables deployment and for overcoming specific challenges in spatial planning. The workshop benefited from the presence of IEA Renewable Energy Working Party delegates and IEA Technology Collaboration Programme members.

This document is a summary of the main outcomes of the workshop, aimed at providing examples of successful solutions and informing the policy-making process.

Revised EU Renewable Energy Directive and the designation of renewables acceleration areas

The Renewable Energy Directive was amended in November 2023 to accelerate the implementation of renewable energy projects in the European Union (EU) Member states. The revised Directive calls on Member states to:

- Conduct a co-ordinated mapping exercise target by 21 May 2025 **to identify the potential and the available areas that are necessary for the installation of renewable energy plants** to meet their national contributions towards the European Union's overall 2030 renewable energy (Article 15b).

- **Designate renewables acceleration areas** (RAAs) by 21 February 2026 where the deployment of a specific type of renewable energy is not expected to have significant environmental impacts (Article 15c).

To assist Member states in this process, in May 2024 the **European Commission compiled a guidance on designating these RAAs**. The guidance explains the provisions of the directive, both on the broader mapping obligation and on the designation of acceleration areas, including the areas to be prioritised for the designation. It also gives an overview of the possible digital tools that can facilitate planning and mapping of areas and encourages Member states to centralise the data collection process to have a more complete picture of the area availability. The guidance also looks at potential environmental impacts of onshore and offshore wind and solar and includes examples of potential mitigation measures, which can be considered to address the identified environmental impacts.

Ensuring the availability of land necessary to achieve the renewable energy targets and identifying acceleration areas require **the development of comprehensive, inclusive and streamlined spatial planning processes across the European Union**. At the same time, each Member state has to ensure co-ordination among all the relevant national, regional and local authorities and entities, including network operators. In the assessment of the potential of the different renewable technologies, Member states have to consider different aspects, such as the projected demand for energy; the availability of energy infrastructure, including grids and storage; and/or the potential to create or upgrade this infrastructure.

The Directive also asks Member states to favour multiple use of these areas. This means combining renewable energy production and other uses of land or sea area, such as food production or nature protection and restoration. Early and upfront spatial planning helps to ensure that the **designated areas for renewable energy project development have a low environmental impact** and thus renewable energy projects are well incorporated into landscapes.

Main findings

Co-ordinate grid and storage infrastructure expansion with renewable energy spatial planning

Availability of modern, strong and expanded grid infrastructure is essential for the development of renewable projects. Many EU Member states rely on old and outdated grid infrastructure. In addition, areas which are the most suitable for renewable power development are often remote with very limited grid capacity. The success of the designation of acceleration areas for renewables projects hinges on the availability of appropriate grid and storage infrastructure to support their integration into the energy system. Proximity to the grid should be considered when mapping RAAs to make sure that these areas are not isolated but rather integral components of a solid and efficient energy system. Once availability of solar and wind within acceleration areas is assessed, the focus must also encompass the modernisation and/or buildout of the associated grid and storage infrastructure, as well as facilitate grid connections.

For example, grid capacity in Portugal is almost exhausted. This means that from a technical point of view, it will be very difficult for Portugal to meet its renewable energy targets unless the grid is expanded. Similarly, Poland also faces issues with grid capacity, as currently it is not sufficiently developed to facilitate the planned renewable energy acceleration. Both countries are planning to significantly accelerate power grid investments; however, much faster action is required to avoid renewables investment slowdown due to insufficient grid capacity.

Enhance collaboration between regional and national authorities

National and high-level guidance is essential to ensure consistency and coherence in the decision-making process. In many Member states, there is often a lack of co-ordination and discrepancies between national-level spatial planning and its implementation at the regional level. While local or regional authorities should have the final say in decision-making, a good governance system should be established at the national level. This would prevent any deadlocks and would make sure that the mapping of these areas is consistent with the wider European renewable ambitions and targets, while also recognising local authorities' views.

In **Italy**, for example, regions are encouraged and empowered to play an active role in the identification of suitable areas for renewable development. The designation of suitable areas for renewable development is a matter of shared competence between the state and the regions. The Ministry of the Environment and Energy Security is responsible for the definition of uniform principles and criteria for the identification (through regional laws) of surfaces and

areas suitable and not suitable for the installation of renewable plants. At the same time, regional and provincial authorities are granted the power and responsibility to identify and define “appropriate and non-appropriate” zones, in compliance with the principles established by state laws. Rewards are granted to the best-performing regions. In addition, to ensure adequate support to the regions, the state is planning to set up a digital ‘’suitable areas’’ platform to connect and process data for the characterisation and qualification of the territory. Some key features of the platform include information on power plants already in operation and energy demand, as well as estimates of renewable energy potential.

Encourage greater stakeholder involvement

The design of RAAs should include effective public participation and community engagement from the very beginning. The workshop discussions highlighted that often community involvement, which is crucial for empowering local decision-making, is often limited within Member states’ planning and decision procedures. A robust participatory mechanism should provide civil society and communities with opportunities to engage, share their feedback in the screening process and help selecting and designing the RAAs. Stakeholders and local authorities should be involved throughout the whole process, including when projects are completed and running. It should be based on specific, accessible and transparent criteria, and all practical information of the RAAs and the related processes should be publicly available and accessible.

Municipalities also play a key role and should be actively involved and equipped with the necessary tools and financial resources to establish and ensure effective participation practices in the long term. Local and regional authorities should also ensure that local communities have the opportunity to participate in the development of renewable projects and make sure they benefit directly from the local production of renewables. This also helps ensure public acceptance and speed up the energy transition.

An example of successful participatory approach to spatial planning is the **Burgenland state in Austria**. At the beginning, a strategic zoning process was carried out for particularly affected protected species (for wind energy, especially birds). This resulted in exclusion zones. Then, the state designed suitable areas for wind power development through the involvement of three main actors: project developers, municipalities and environmental non-governmental organisations (NGOs). It is a bottom-up approach, where the input for zoning comes from the developers after they have held initial consultations with municipalities and NGOs. The involvement and participation of local NGOs from the start is essential for increasing the community’s trust in the process, which then simplifies the decision-making procedure for local authorities.

Tailor spatial planning to local and country-specific circumstances

The identification of RAAs needs to take into account each country's specific characteristics. While there is a consensus on the definition of RAAs and the key aspects that need to be considered when defining them, their identification cannot be standardised and should be based on the geographical, administrative and social specificities of the country.

For example, **Germany** has experienced some opposition towards wind energy deployment. As such, authorities have opted for a gradual build-up of the industry and decided to declare 1.6% of its territory as available for wind energy by 2026 and 2% by 2032. In addition, all the areas where wind energy is already built need to be declared as accessible for repowering.

In contrast, in **Estonia** the selection process relies on elimination criteria. This means that the territory is mapped to identify areas that could be suitable for wind deployment by excluding the ones where it would not be possible. Currently, there are 22 areas where wind energy could be built, and auctions are set to be organised by the end of the year. All the data are available and accessible online and can be freely consulted by project developers.

Another example is **the Netherlands**, where dense population and limited availability of space for renewable projects called for a strategic approach in land allocation for the energy transition. As such, the Ministry of Economic Affairs and Climate Policy has prepared a spatial plan to make sure that there is enough space available and reserved for the development of energy infrastructure of national importance between 2030 and 2050. To encompass the complexity of the energy system, the grid operators have analysed seven scenarios, all differing from each other in terms of energy implementation (i.e. higher and lower energy demand per sector; amount of import and export of energy; amount of electricity generation by solar, wind or nuclear energy) and spatial requirements. These scenarios are seen as cornerstones of energy system planning by 2050 and are the main drivers of energy infrastructure spatial planning.

Given the Netherlands' geographical features and current industrial development, it makes sense for the country to cluster energy infrastructure around the current industrial harbours. However, even in these areas, the need for space is greater than the actual availability, as industrial harbours are surrounded by cities, villages and agriculture fields, which complicates the permitting process. As such, an expansion of these locations is necessary and requires a focus on the transition between the current use of the industrial clusters and their envisaged use in 2050. This can offer opportunities to redesign industrial areas and can also be an answer to the spatial demand of the energy infrastructure.

Provide local authorities with the necessary resources and tools for the designation of renewables acceleration areas

Local authorities need significant guidance and support from the central government in the designation of RAAs. In many countries, the development of renewable projects is often delayed by administrative shortcomings at the regional/local level, which could be due to a range of issues, such as lack of skilled personnel or of digitalised systems. Although both national and local authorities play a crucial role in the designation of RAAs and spatial planning, workshop participants highlighted the need for national authorities to provide further guidance to local authorities to fulfil their role. The following four key areas of support have been identified:

- **Clear guidelines**. The national government should provide clear guidelines to local municipalities for the identification of RAAs. The selection process should be based on transparent, clear and objective criteria which take into consideration the existing local energy system.

- **Funding**. Local authorities should be equipped with the necessary financial resources to support the overall identification process.

- **Staff**. Member states should make sure that there is enough expert staff for local municipalities and administrations, as well as national authorities, to rely on for the identification and designation of RAAs.

- **Knowledge**. A set of tools (including digital ones) should be provided to ease the identification and design of acceleration areas.

These supporting tools can provide a harmonised methodological approach to area selection and assist local authorities in identifying and designating RAAs. This in turn can facilitate the national government's role of overseeing, co-ordinating and centralising the overall process.

Make use of advanced digital tools to support the designation of renewables acceleration areas

Digital tools, such as Geographic Information Systems (GIS) and information technology (IT)-based spatial mapping software, are essential to determine the best suitable places for renewable energy project development. The workshop participants highlighted that a recurring challenge among Member states is that national, regional and local data are very often outdated, not harmonised and inconsistent. GIS and IT-based spatial mapping tools can help to assist the development of multilayer views of geographical areas and are key instruments to support collaboration between policy makers and project developers in the RAA designation process.

Several features are critical for these tools to be successful. First, tools should be based on a holistic system and use the same geographical referencing system across various sectors. Second, digital tools should allow for the merging and centralising of a large set of various available data that are useful for project developers. For instance, knowing the existing land designation and ownership would help developers to understand the current status of the land and consequently which type of technology solution would be allowed.

There are several successful examples across Europe of the use of digital tools for RAA designation. In July 2023, **Portugal** started an exhaustive mapping of renewable potentials. The aim was to identify the areas in the country with less sensitivity that could be eligible for a more simplified permitting process for solar and wind and allow accelerated deployment without compromising other environmental and territorial values. As such, a detailed mapping has been carried out at a local level. The resulting areas could potentially be candidates for simplified permitting processes, but they are not exclusive, as they are not the only places in the country where it would be possible to implement renewables. Municipalities have free access to the results of the mapping exercise and can use this information, as complementary to urban planning, to assess and evaluate the potential for renewables on their area.

Another successful example is Spain, which is publishing data on suitable land for solar photovoltaic (PV) deployment based on exclusion indicators and weighting indicators. This means that the more sensitive the area, for example urban areas or flood zones, the more difficult it is to obtain a permit. The data are provided by autonomous communities, but the aggregation is centralised and carried out by the national government. This approach provides clarity to project developers, as well as good visibility to the renewable industry.

Explore the use of artificial intelligence tools

The use of artificial intelligence (AI) tools can support the RAA designation process. There are a few difficulties that might arise when developing and using digital tools for land allocation for renewables; for example, data are not always precise and are often outdated. These types of challenges could be overcome with AI.

For example, when mapping its territory, **Italian** authorities receive the data from the regions, from Terna (national transmission operator) and from the Environmental Protection Agency. Normally, these sources are sufficient to collect all the needed information for the identification of RAAs. However, if parts of data are missing, such as in the case of the Sicily region, AI is used to fill in the gaps.

Another example of the use of AI and automation is in the **United States**. AI is being tested to carry out the desktop work, which is often time-consuming, to free up the developer for activities that require human interaction.

Preliminary recommendations

Based on workshop findings, policy makers should consider focusing on the following actions to address challenges related to spatial planning for renewables deployment:

- Co-ordinate the expansion of grid and storage infrastructure with the designation of RAAs to support the integration of renewable energy projects into the energy system.
- Enhance the collaboration of national and local authorities in the land designation process to ensure that it is consistent with the wider European renewables targets.
- Develop a robust participatory mechanism, where stakeholder involvement and community engagement are promoted from the beginning of the process.
- Make sure that the process of identifying renewable acceleration areas is not standardised, but tailored to the geographical, administrative and social specificities of countries, as well as based on a comprehensive assessment of the main risk factors.
- Provide local authorities with a harmonised methodological approach, tools (i.e. guidance material) and resources to assist them in identifying and designating RAAs.
- Encourage the use of advanced digital tools, such as GIS and IT-based spatial mapping software, to assist in identifying the most suitable places for renewable energy project development.
- Explore the use of artificial intelligence tools to overcome any difficulties that might arise when developing and using digital tools for land allocation for renewables.

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