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European Climate, Infrastructure and Environment Executive Agency - CINEA

PERMITTING

INSIGHTS FROM INNOVATION FUND PROJECTS

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PERMITTING – INSIGHTS FROM INNOVATION FUND PROJECTS

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PERMITTING

INSIGHTS FROM INNOVATION FUND PROJECTS

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ABSTRACT

As recognised by the Net-Zero Industry Act (NZIA) ([1]), permitting is one of the key challenges in projects deploying innovative solutions for climate change mitigation. This finding was confirmed by the evidence presented in the first *Annual knowledge sharing report of the Innovation Fund – De-risking innovative low-carbon technologies* ([2]). Permitting issues namely ranked highly in the list of concerns for beneficiaries and in the list of reasons for delays, which is why this report presents an extended analysis gathering in-depth insights from the Innovation Fund (IF) projects. Namely, the European Climate, Infrastructure and Environment Executive Agency (CINEA) conducted a **dedicated survey on permitting**, targeting the whole IF portfolio of ongoing projects and discussed the results at a dedicated workshop. The resulting main takeaways are summarised below.

Most project coordinators confirmed that obtaining the necessary permits is a **critical step** in the project's progression. Namely, most projects indicated that they need to acquire permits to operate, whether by applying for new permits, updating existing ones or both. An average of seven **permits** are required to implement an IF project; the most commonly required permits fall in the construction and environmental categories, with the environmental permits being most often considered the most burdensome one to obtain. Together with financing agreements, supply and off-take contracts, permits are mandatory documents that often need to be approved and in place for projects to successfully reach financial close (FC) ([3]) (some permits, such as operational ones, are due at a later stage). In many instances, the process of obtaining the necessary permits is very demanding and time-consuming. Permitting is an issue for many projects in the IF portfolio, with 68% identifying it among the top challenges and more than 10% of the projects identifying it as their primary challenge. About half of the projects report a concrete risk of severe delays due to difficulties obtaining the required permits or because of the challenging permitting procedures. Some projects reported that permitting delays may put the project at risk of not meeting the four-year deadline for achieving FC. Less than a quarter of the respondents considered permitting not to be a challenge.

In most cases, the challenges and delays are due not simply to the scale of the effort required, but also to the difficulty of applying the existing permitting procedures to **innovative solutions**. Even those projects that reported positive interactions with permitting authorities (over a third of the total) experienced delays and difficulties. Difficulties arose due to several issues: for example, the lack of specific rules and the lack of harmonised EU practices on emerging technologies such as Carbon Capture and Storage (CCS), Carbon Capture and Utilisation (CCU) or hydrogen production, along with the unavailability of adequate benchmarks to set reference values, or the complexity in combining different technologies, each falling under separate regulations and permitting procedures.

The amount and type of effort required for permitting, and their impact on the IF projects vary substantially depending on their **field of activity**. Projects belonging to the Industrial Carbon Management (ICM) and Hydrogen clusters are particularly exposed to permitting procedures outside of their project scope (related to their need for infrastructure) and would benefit from a regulatory environment more targeted to their activities; Renewable Energy (RES) projects struggle in particular when proposing radical innovations and can be heavily dependent on grid access; Energy-intensive industries (EII) projects need a high number of permits, the most burdensome being the environmental ones, and are as likely as not to be delayed by

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([1]) Regulation EU 2024/1735 of the European Parliament and of the Council of 13 June 2024 on establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem and amending Regulation (EU) 2018/1724: http://data.europa.eu/eli/reg/2024/1735/oj.

([2]) European Commission: European Climate, Infrastructure and Environment Executive Agency, Przadka, A., Sales Agut, C., Bravo, B., Grosjean, M. et al., *Annual knowledge sharing report of the Innovation Fund – De-risking innovative low-carbon technologies*, Publications Office of the European Union, 2024: https://data.europa.eu/doi/10.2926/861952.

([3]) Financial close is the moment in the project development cycle where all the project and financing agreements have been signed and all the required conditions contained in them have been met. IF projects are legally required to reach FC within four years from project signature.

permitting issues; Energy Storage (ES) projects and manufacturing projects across clusters are the least impacted in terms of effort required and risk of delay.

Projects **responded to the permitting challenges** in several ways. Most commonly, in 23 cases, they enhanced their interactions with the authorities, making them closer, deeper and more frequent. In 14 cases, projects hired external specialists; in 10 cases, they allocated a higher number of and/or more experienced employees. This underscores the importance of early engagement with the authorities, evaluating the effort needed and devoting sufficient personnel to it. In some cases, projects revised their permitting approach or engaged with similar projects to share information and best practices or engaged further with relevant authorities.

Projects proposed various solutions to improve the permitting process. **Key suggestions** included ensuring that more financing and resources are made available to the authorities dealing with project permitting, establishing a special regime for key decarbonisation projects such as a regulatory sandbox ([4]) or priority status, simplifying interactions with authorities through a one-stop shop or single point of contact, and introducing more flexibility, such as by allowing parallel permitting procedures or limited design changes without having to restart the procedures from the beginning. The digitalisation of the procedures is well advanced: complete digital submission is already available to over 60% of projects, while about half of them report that a fully digital interface is made available by the permitting authority for the entire process. A common recommendation by the participants is to digitalise the procedures further.

The complexity and duration of permitting processes in the EU are regarded as significant barriers to low-carbon investment by project promoters. The intricate nature of EU and national legislation, combined with the lack of coordination between authorities and of experience with new technologies within them, are among the top challenges faced during the permitting process. Furthermore, the numerous permits required to bring a low-carbon project to fruition vary greatly in nature and are issued by diverse authorities, which leads to a high administrative burden and can slow down deployment and replication. The criticality of streamlining permitting is recognised by widespread efforts at EU and Member State level, including specific measures to speed up permitting for renewable energy ([5]), net-zero technology manufacturing and energy-intensive industry decarbonisation ([6]).

([4]) A regulatory sandbox is a framework that allows companies and start-ups to test innovative products, services, or business models in a controlled environment, under the supervision of a regulatory authority. The purpose of a regulatory sandbox is to provide a safe space for companies to experiment with new ideas, without being subject to the full regulatory requirements that would normally apply to their operations. The regulatory sandbox typically has a limited scope, duration, and number of participants, and is designed to strike a balance between promoting innovation and ensuring consumer protection. Companies that participate in a regulatory sandbox are typically required to report on the outcomes of their testing, and the regulatory authority may use this information to inform its policy decisions. Overall, regulatory sandboxes are seen as a way to encourage innovation and reduce the regulatory barriers that can sometimes stifle new ideas and products, while still ensuring that consumers are protected from harm.

([5]) Provisions for simplify permitting processes as part of the Renewable Energy Directive: https://energy.ec.europa.eu/topics/renewable-energy/enabling-framework-renewables_en

([6]) Streamlined permitting under the Net Zero Industry Act: https://single-market-economy.ec.europa.eu/industry/sustainability/net-zero-industry-act/streamlined-permitting-and-information-project-promoters_en

CONTENTS

1. INTRODUCTION

Permitting has been recognised as a central issue in EU policymaking in multiple policy areas. The REPowerEU initiative has provided specific recommendations on speeding up permit-granting for renewable energy and related infrastructure projects ([7]); similarly, projects deemed strategic under the Critical Raw Materials Act ([8]) benefit from shorter permitting timeframes. Furthermore, most significantly for the Innovation Fund (IF), the Net Zero Industry Act (NZIA), which aims to boost the competitiveness of EU industry and technologies crucial for decarbonisation, considers the reduction of administrative burdens and simplification of permit-granting processes as its first key pillar. Specifically, projects deemed strategic under the NZIA ([9]) obtain priority status at the national level for all administrative processes and enjoy a faster permitting timeline (with a maximum duration between 9 to 18 months depending on the project), and EU Member States are encouraged to establish net-zero regulatory sandboxes to test innovative net-zero technologies in a controlled environment. The NZIA also envisages the creation of a single point of contact for permitting procedures within each Member State. In addition, the importance of permitting in the transition to a net-zero economy is confirmed by the more recent EU policy initiatives, in particular the Clean Industrial Deal and the upcoming Industrial Decarbonisation Accelerator Act.

The importance of permitting has also been confirmed by bottom-up evidence emerging from the IF projects, which aim to deploy low-carbon solutions on the ground in the EU. As highlighted in the 2024 *Annual Knowledge Sharing Annual Report of the Innovation Fund* ([10]), permitting is one of the main factors leading to delays in reaching financial close (FC) or other important project milestones. Permitting issues particularly affect projects operating in the emerging and/or fast-growing sectors, which are at the core of the energy transition and thus of the IF portfolio. As the evidence from the IF portfolio had emerged in an organic manner (for example, when a delay in permitting affected the implementation of the project/ or when a delay in permitting delayed the project tasks), the Directorate-General for Climate Action (DG CLIMA) and the European Climate, Infrastructure and Environment Executive Agency (CINEA) decided to collect information in a more structured way, via a dedicated survey (see Annex I). This structured collection of information reported by projects was deemed useful to (i) identify and analyse the difficulties in obtaining the necessary permits to operate, and (ii) report to policymakers about the problems emerged and share the good practices identified on the ground. The main results of the survey were presented at the IF knowledge sharing workshop on Permitting, held in Brussels on May 7th, 2025. This report draws its content mainly from the following two sources: the survey and the subsequent workshop.

This report complements and extends the annex of the *2025 Annual Knowledge Sharing Report of the Innovation Fund– De-risking innovative low-carbon technologies* ([11]), published in July 2025 (ANNEX 1 – EXECUTIVE SUMMARY OF PERMITTING ANALYSIS).

([7]) European Commission Press release of 13 May 2024: "Commission presents guidance and recommendations to accelerate renewable energy roll-out ahead of REPowerEU anniversary": https://ec.europa.eu/commission/presscorner/detail/en/ip_24_2489

([8]) Critical Raw Materials Act: https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/critical-raw-materials-act_en

([9]) Strategic projects under the Net Zero Industry Act: https://single-market-economy.ec.europa.eu/industry/sustainability/net-zero-industry-act/strategic-projects-under-nzia_en

([10]) European Commission: European Climate, Infrastructure and Environment Executive Agency, Przadka, A., Sales Agut, C., Bravo, B., Grosjean, M. et al., *Annual knowledge sharing report of the Innovation Fund – De-risking innovative low-carbon technologies*, Publications Office of the European Union, 2024: https://op.europa.eu/en/publication-detail/-/publication/56611073-3f2b-11ef-bf41-01aa75ed71a1/language-en

([11]) European Commission: European Climate, Infrastructure and Environment Executive Agency, Przadka, A., Aleman, M., Bravo, B., Darida, M. et al., *2025 annual knowledge sharing report of the Innovation Fund – De-risking innovative low-carbon technologies*, Publications Office of the European Union, 2025: https://data.europa.eu/doi/10.2926/9356836

2. SOURCES AND MAIN RESULTS

2.1. The survey

The Innovation Fund Permitting Survey 2024 was developed by CINEA and DG CLIMA, with contributions from the Directorates-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) and Energy (DG ENER). It was sent out to the entire IF portfolio of ongoing projects via EUSurvey in October 2024.

Out of the 121 IF project beneficiaries who received the survey, 90 replied. It is relevant to highlight that the vast majority of the projects that did not fill in the survey informed CINEA that the reason for declining participation was because, having started recently, they considered they could not contribute with meaningful insights. In addition, CINEA ensured that all projects which had reported permitting issues in the periodic or progress reports, or through amendment requests, duly completed the Survey. Therefore, the sample of 90 replies constitutes a very large share of the total number of ongoing IF projects with relevant permitting experience and guarantees a good coverage of the different project sizes, sectors and geographical locations (23 EU Member States / EEA countries are represented in the sample).

The survey was divided in five main sections:

I. Permits required for starting operation
II. Engagement with authorities
III. Permit application process
IV. Activities related to permitting process
V. General questions

The survey contained both multiple choice and quantitative questions, which can be easily aggregated, as well as a number of open questions which gave the project beneficiaries the opportunity to detail their experiences, highlight issues, suggest remedies and report best practices in a more extensive and qualitative manner.

A more detailed description of the questionnaire is available in Annex II.

2.2. The Innovation Fund knowledge sharing workshop on Permitting

Permitting has been discussed in multiple Innovation Fund knowledge sharing workshops ([12]); in particular, the ones dedicated to Energy Intensive Industries and Hydrogen, held on 9 April 2025 and 18 November 2024 respectively, programmed permitting as one of the main topics to be debated. Most importantly, the Innovation Fund knowledge sharing workshop on Permitting held on 7 May 2025 was fully dedicated to this topic. The workshop was held in hybrid format; 31 IF projects from 7 Member States, and numerous officials from the European Institutions participated on site, while over two hundred participants, representing 77 IF projects and all Member States plus Norway, joined online. Selected projects shared their experiences, and all on-site participants took part in roundtable discussions devoted to specific permitting issues and challenges. The key findings of the permitting survey were presented at the workshop, and served to introduce the main permitting issues identified within the IF portfolio followed by discussions about their causes, impacts and possible solutions. This report uses this qualitative information, as well as additional input from the preceding knowledge sharing workshops, to substantiate the more quantitative input derived from the survey.

([12]) Summaries of the workshops, as well as additional information on knowledge sharing activities, are available on CINEA's website: https://cinea.ec.europa.eu/programmes/innovation-fund/knowledge-sharing_en

2.3. Main survey results

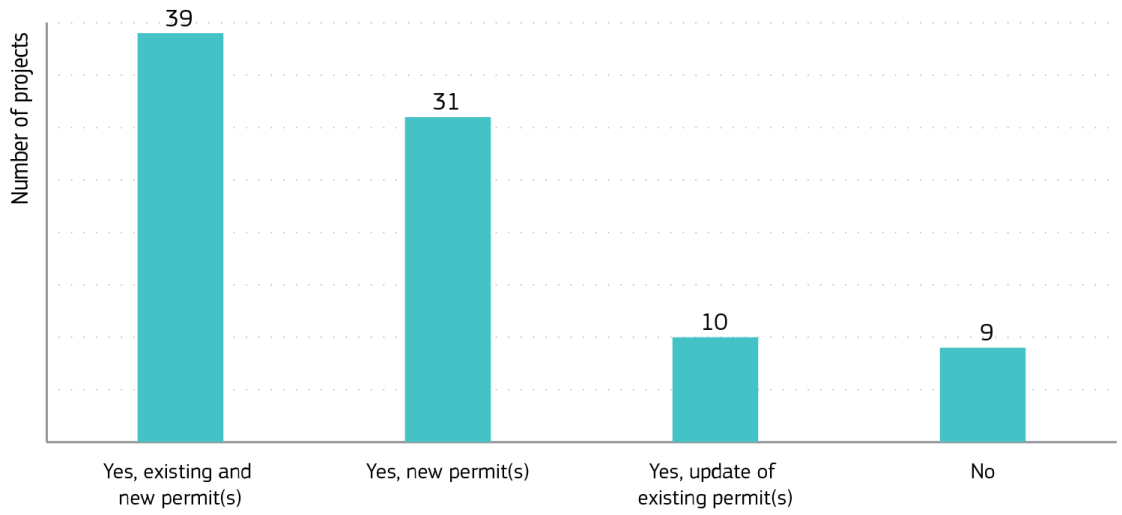
Figure 1 shows the distribution of the 90 respondents divided by type of call, i.e. the large-scale and the small-scale ones ([13]). In terms of maturity, 22 projects belong to the 2020 calls, 24 to the 2021 calls and 44 to the 2022 calls - with response numbers in line with the number of projects in each call. It must be noted that, at the time of the completion of the survey, the grant agreements for the proposals shortlisted for financing under the 2023 calls were not signed yet and therefore their coordinators were not contacted.

Figure 1. Survey respondents by year and type of call

The first take-away from the survey is that **the vast majority of the IF projects** that responded **required permits**; only 9 projects reported that they did not perform any permitting related work. This does not mean that no permit was needed for their activities. Rather, in most cases, these projects were located in already operational installations, so that the implementation of an IF project in those specific locations did not require additional permits; generally, they were manufacturing projects, which just had to adapt their facilities to make a new product. In one case, the project was located in a dedicated testing site which already possessed all necessary authorisations. The other 81 respondents reported that they required to work on permits, either by submitting a request for new one(s) (32), updating existing one(s) (10) or both (39), as shown in Figure 2.

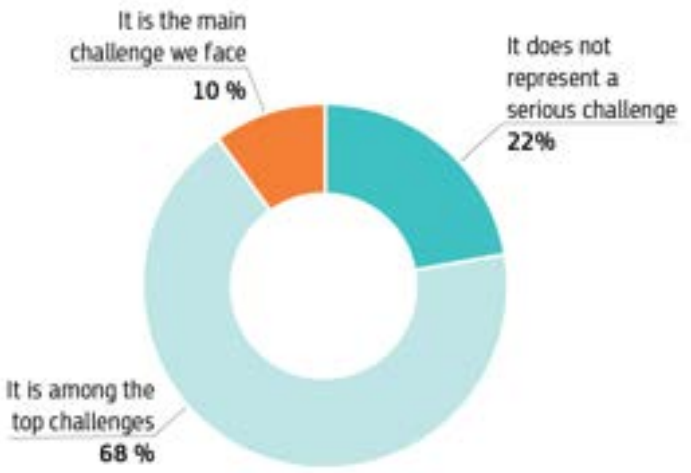
([13]) In the Innovation Fund calls launched between 2020 and 2022, a small-scale project means a project with capital expenditure (CAPEX) between EUR 2.5 million and EUR 7.5 million at the time of application, while a large-scale project (including large-scale pilot demonstration project) means a project with CAPEX above EUR 7.5 million at the time of application.

Figure 2. Number of projects requiring new permits and/or update of existing permits



Having established that obtaining permits is needed for most IF projects, it is important to determine how much of a challenge it poses for them. Within the survey, respondents were asked to reply to this very question. As illustrated in Figure 3, the permitting process was recognised as a major challenge for project development, with two thirds of respondents ranking it among their top challenges. One project in ten went even further, identifying it as the single most significant hurdle for their project

Figure 3. How projects rank the potential impact of the permitting process



Overall, the results of the permitting survey clearly support the need to streamline permitting processes in order to increase the speed of industrial decarbonisation in the EU: almost all IF projects need to work on permitting, and for a clear majority, obtaining the necessary permits is a serious challenge. This report will substantiate this conclusion by showing which permits

are needed, which authorities are responsible for issuing them, what is the effort required, how serious the risks are, and what challenges, solutions and best practices emerge from the overall portfolio but also within specific sectors.

3. PERMITS TYPES AND COMPETENT AUTHORITIES

3.1. The most commonly required permits

The implementation of the IF projects included in the survey sample requires the management of **over 700 distinct permits**, an average of over seven per project. It should be noted that this number reflects the permits that projects identified at the moment they completed the survey; quite likely, a project in its early stages (e.g., prior to financial close) will identify additional permits when progressing towards entry into operation (EiO) ([14]) and even later, when placing its product or solution on to the market. Namely, projects typically investigate permitting before submission, and then have to commit to obtaining a number of permits before financial close; these permits are those needed before starting the construction activities, such as an environmental permit or the construction permit itself; additional permits can be obtained only after construction, such as the operational and safety permits which are usually dependent on on-site verification by the competent authorities. Therefore, this high number is likely to be an underestimate of the final one, which will emerge during the projects' lifetime.

The survey was structured as follows:

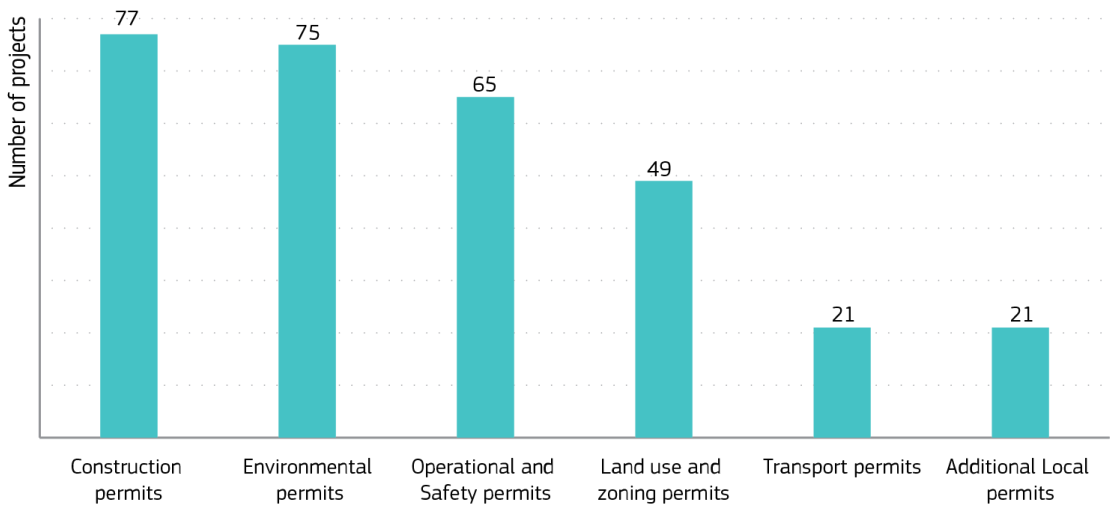
- Six **categories of permits**: environmental, construction, land use and zoning, operational and safety, transport, and (additional) local permits.
- Within these main categories, respondents could indicate the **specific permits** they required among a list of options, for example, a water use permit within the environmental permits category. These specific permit types are referred to as sub-categories in the text.
- Lastly, respondents had the opportunity of adding information when the choices given by the survey did not capture their situation.

This section will analyse the results per category, then verify the correlation between the number and kind of permits with the project size and IF cluster, and finally present the results in terms of the specific permit needs. The analysis of the results highlights the complexity, diversity, and unique permitting needs of each project, underscoring the need for streamlined and coordinated approaches to industrial permitting in the EU.

The main categories of permits required by the IF projects are presented in Figure 4. The chart shows the number of respondents that need at least one permit in each of the categories.

([14]) Entry into operation is the moment in the project development cycle where all elements and systems required for operation of the project have been tested and activities resulting in effective avoidance of greenhouse gas emissions have commenced.

Figure 4. Number of projects requiring permits in each of the six permit categories



First comes the category of **construction permits**, i.e. the permits necessary to initiate and manage construction-related works. This category encompasses a wide range of permits, including those required for refurbishment, building, equipment installation, administrative authorisations, declarations of public utility and grading permits. Depending on the jurisdiction, they can be combined or issued separately.

Environmental permits, designed to mitigate the negative impacts that projects may have on natural resources, ecosystems and public health, is the second most commonly required category of permits. Within this category, the most recurrent are those required to obtain a general environmental authorisation, followed by the need to complete an environmental impact assessment and by water use permits. It should be noted that environmental permits are vital not only because of the obvious importance of making economic activity compatible with environmental protection, but also because of their positioning within the project timeline. Namely, some environmental permits are generally needed as a prerequisite to start construction work; most commonly, an environmental impact assessment and/or an environmental authorisation are needed before applying for a construction permit. These permits are thus generally a prerequisite to start for IF funded projects, and they are needed to achieve financial close within the mandatory four years.

The third most required category is **operational and safety permits**, which includes a very diverse range of requirements, including electricity production/generation licenses, exploitation authorisations, grid connection permits, health and safety certifications, fire permits and very specific permits such as those related to radar interferences. These permits are essential to ensure the safe and efficient operation of projects and obtaining them is a critical step in the project development process.

Next comes the category of **land use/zoning permits**, which plays a vital role in the successful completion of projects, as they grant authorisation for the use of a specific surface area; typically, these permits are among the very first to be obtained, before proceeding to build an installation or repurpose an existing one.

Among the **transport permits**, it is noteworthy that a substantial number of projects needs a road transportation permit, generally related to the exceptional or hazardous nature of the goods transported.

Finally, the **additional local permits** category covers those permits that do not belong to the categories listed (e.g., an archaeological permit, compliance with landscaping constraints or an authorisation to fell mature trees). Several projects within the IF portfolio permitting survey revealed the need to comply with a very wide range and high number of such permits.

The results illustrated above refer to the overall sample of the survey. The following section of the analysis highlights correlations between the number and type of permits flagged by respondents in the survey and the types of projects to which these answers relate.

To set the baseline, Figure 5 profiles the survey participants, acknowledging the influence of these profiles on the overall survey results. Projects are classified by their size – small-scale or large-scale – and the IF cluster: Energy-Intensive Industries (EII), Industrial Carbon Management (ICM), Renewable Energy (RES), Hydrogen and Energy Storage (ES). The size distribution in the surveyed projects is quite balanced, with 57% of the projects being large-scale. Concerning the IF clusters, the largest one is EII, representing 39% of the surveyed projects. The definition of the IF clusters and a more detailed analysis of the permitting aspects per cluster can be found in Section 6.

Figure 5. Profile of the projects participating in the survey per project size and cluster

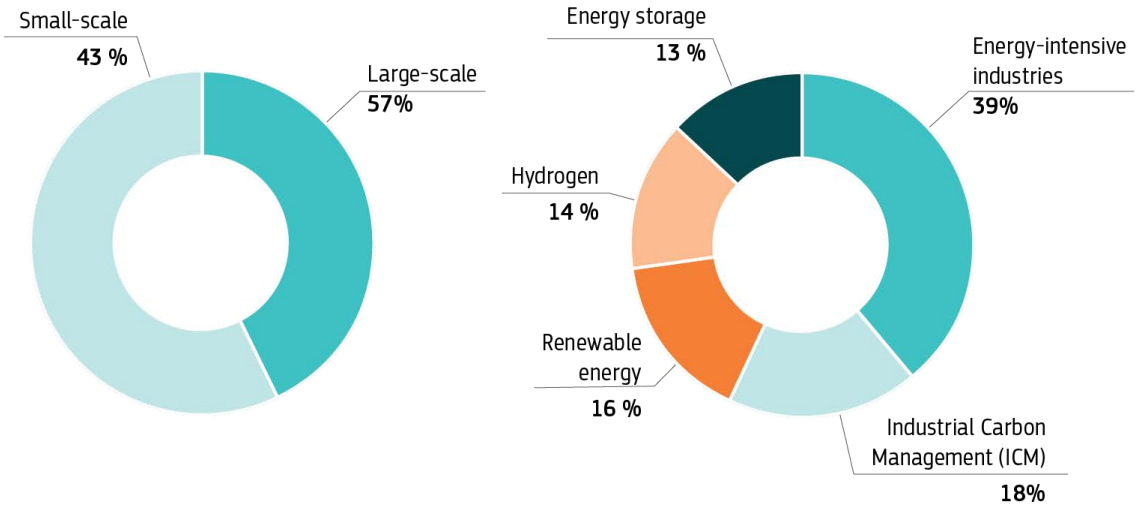
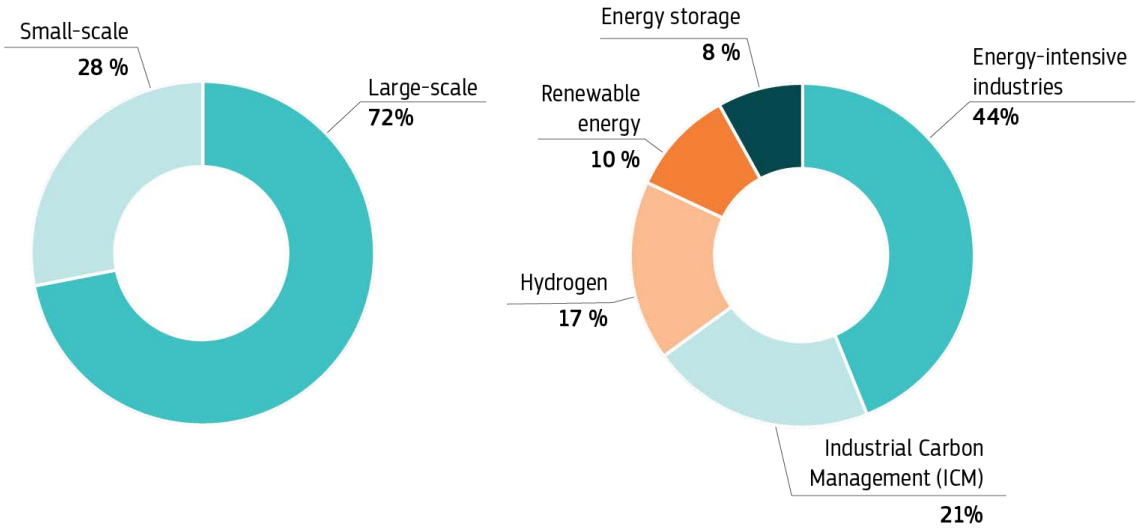


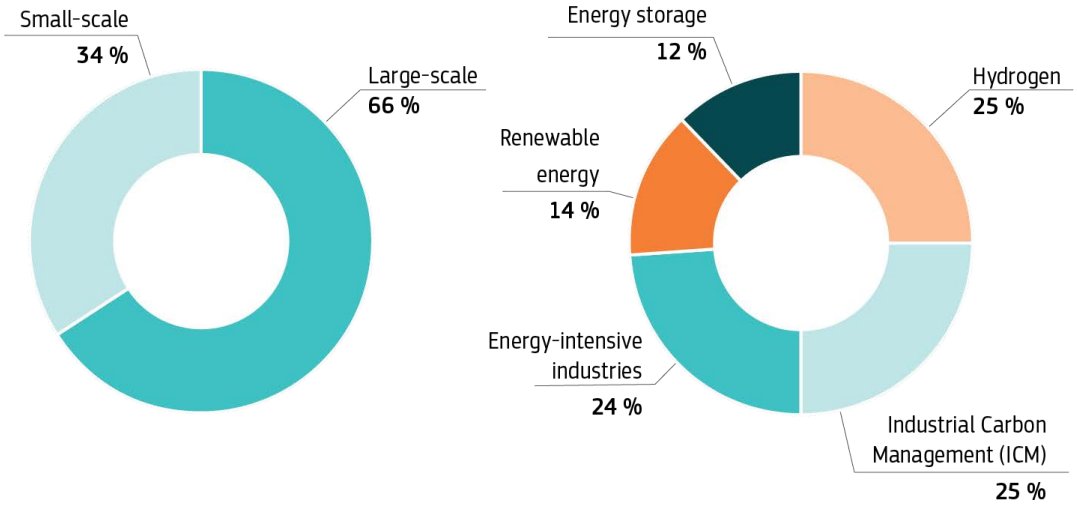
Figure 6 presents the total number of permits flagged by the respondents per project size and cluster. A quick comparison with Figure 5 shows that small-scale projects represent 43% of the sample but require only 28% of the permits. Similarly, Energy Storage projects seem to require substantially fewer permits (8% of the total) than their share as a percentage of projects (13%).

Figure 6. Distribution of permits per project size and cluster



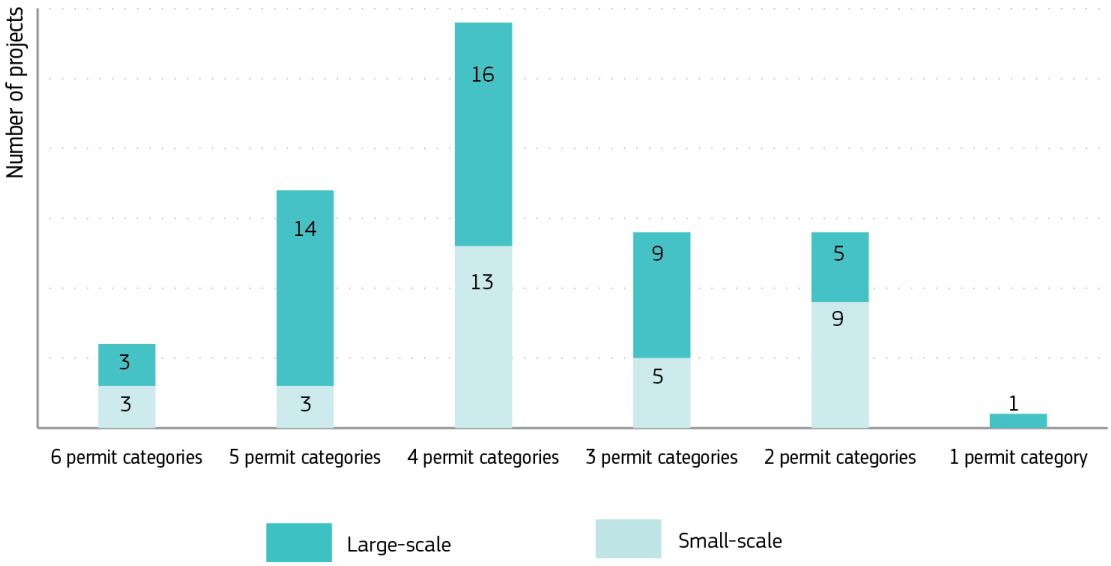
A visually more intuitive way to represent these distributions is to normalise the data by the number of permits relative to the project profile, that is, the number of permits per unit of project size or per cluster. The normalised data present a clearer picture of the projects most burdened by permits, as shown in Figure 7. Regarding the size of the project, the normalised data would have shown a 50% split for the large-scale and small-scale projects if they had an equal relative permit load; however, it is clear that large-scale projects have a much higher share of the total number of permits required, representing about two-thirds. Concerning the clusters, an equal permit load for each cluster would have amounted to 20%; however, it emerges clearly that RES and ES projects require fewer permits, while the other clusters require more, each representing around a quarter of the permitting load. A more detailed analysis focusing on the five clusters is available in Section 6.

Figure 7. Normalised distribution of permits per project size and cluster



Having described the situation with regard to the overall number of permits, it is interesting to verify how many projects require permits across the six permit categories described above (land use and zoning, construction, environmental, transport, operational and safety, and local permits). Out of the 90 projects, only 6 projects declared having had to submit new permits or update existing permits for all six categories. The six projects in question belong to the EII and Hydrogen clusters. A majority of respondents (51%) indicated that they needed to engage in permitting procedures for four or five categories, as represented in Figure 8. Predictably, large-scale projects require the widest range of permits, dominating the chart for five, four and three categories of permits. Furthermore, the graph shows that small-scale projects may also necessitate permits in every category, or in most of them: three small-scale projects require permits in all six categories, and another three require them in five.

Figure 8. Number of projects requiring permits in different permit categories



3.1.1. Permits across the permit categories and subcategories

The precedent analysis detailed the permits required by projects in the main six categories, while the following discussion provides a granular analysis of the permitting needs, diving into the specific types of permits (or permit subcategories) listed in Table 1.

Table 1. List of the specific permits (subcategories) required by projects

LAND USE AND ZONING PERMITS

- Zoning Permit (Confirmation that the activity complies with local zoning regulations)
- Land Use Permit (Confirmation that the land is designated for the intended use)

CONSTRUCTION PERMITTING

- Planning Permit/ Prior Administrative Authorisation
- Construction Permit
- Grading Permit (If land grading or excavation is needed).
- Activity and Works Permit (i.e., the permits required to refurbish, place equipment, or otherwise modify existing buildings and installations)
- Declaration of Public Utility

ENVIRONMENTAL PERMITTING

- Environmental Impact Assessment Completion
- Environmental Authorisation/Permit
- Air Quality Permit: Address emissions and air quality standards
- CO_2 Storage Permit/Concession
- Waste Permit
- End of Waste Certification
- Hazardous Waste Permit
- Water Use Permit
- Water Discharge Permit
- Noise Permit
- Other sector-specific permits

TRANSPORT PERMITTING

- Road Transport Permit
- Rail Transport Permit
- Dangerous goods Road Transport Permit
- Dangerous goods Rail Transport Permit
- Hazardous waste Road transport Permit
- Hazardous waste Rail transport Permit
- Marine Transport Permit
- Inland Water Transport Permit

OPERATIONAL AND SAFETY PERMITTING

- Operation Permit/License (e.g. electricity production/generation license, exploitation authorisation)
- Corporate/Legal/Fiscal licenses or processes
- Fire Safety Permit
- Radar Permit
- Occupational Health and Safety Permits
- A single Safety Permit covering all areas
- Grid connection permits and processes

LOCAL PERMITTING

- Compliance with additional specific local ordinances and regulations

Among the six categories, Environmental Permitting received the largest share of responses (37%), as represented in Figure 9. However, the specific permit that registered the highest number of responses is the Construction Permit, with 70 projects flagging it as necessary, corresponding to 78% of the survey participants, and around 10% of the total permits needed by IF projects.

Figure 9. Distribution of specific permits per main permit category

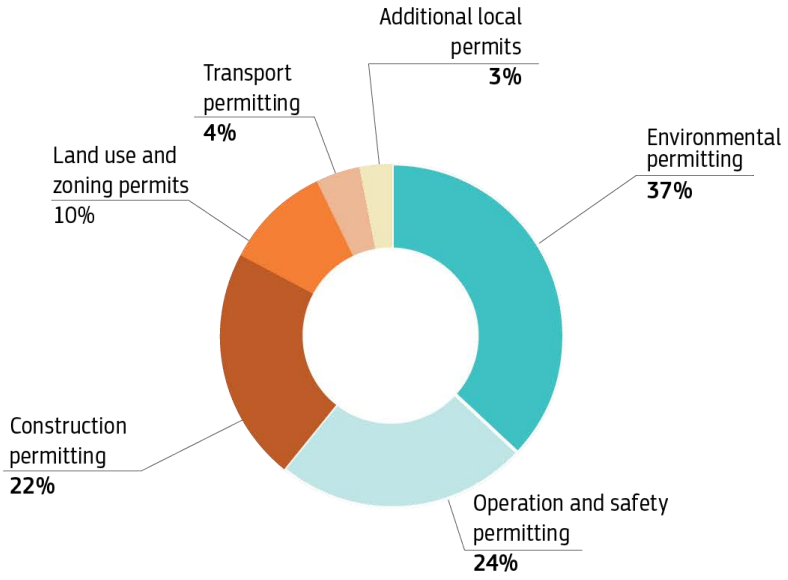
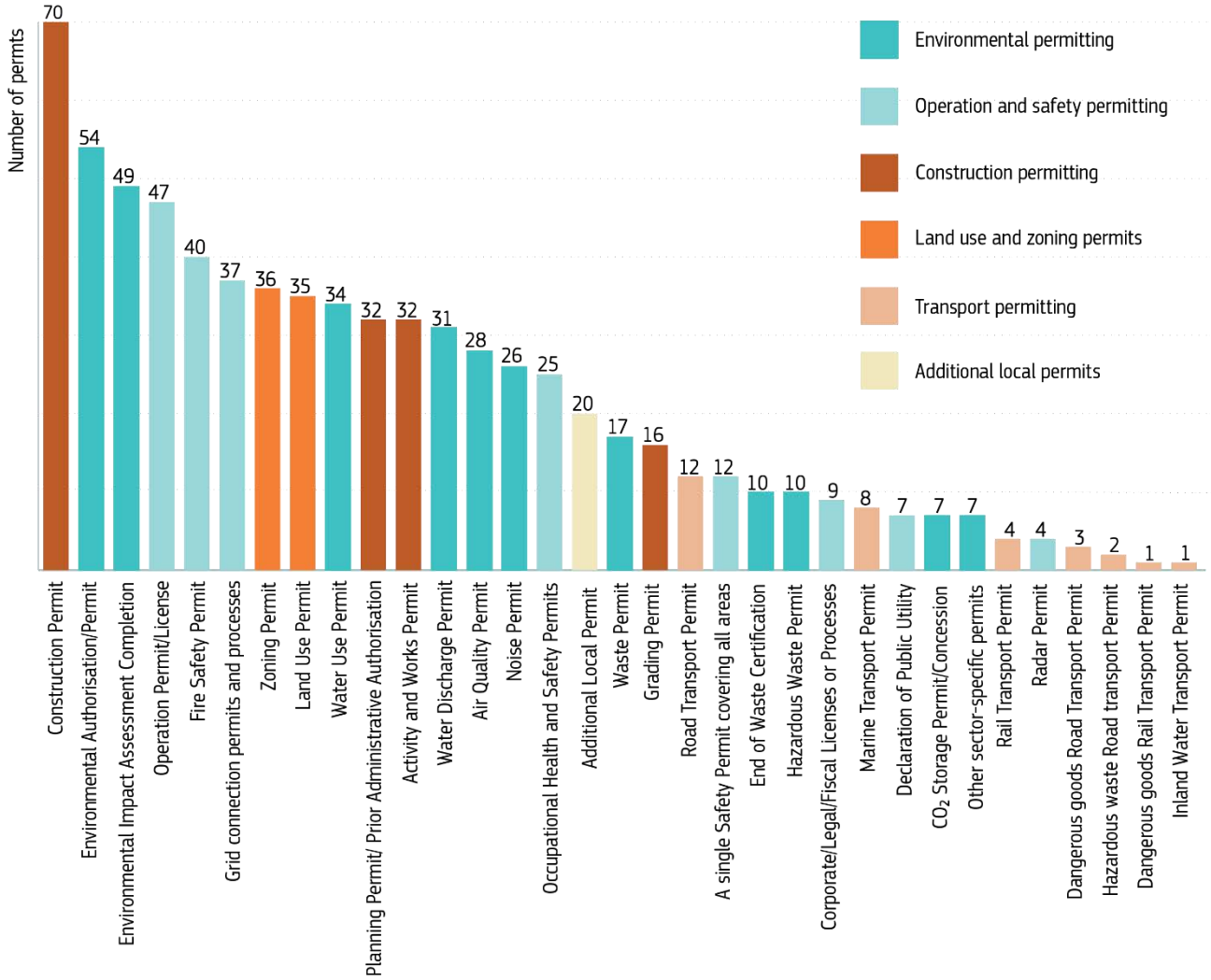


Figure 10 shows the number of permits needed in each of the permit subcategories. Here it is evident how more general specific permits, such as the Construction Permit or various kinds of environmental and operational permits, coexist with a long tail of specialised permits, such as those required for the different transport modes.

Figure 10. Number of permits per permit subcategory

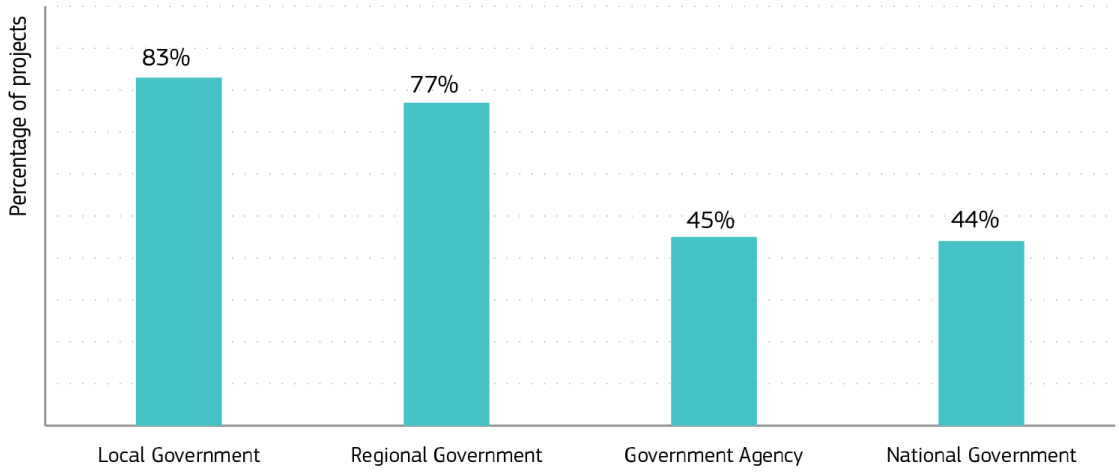


3.2. Administrative levels and interactions with the authorities

In order to obtain the relevant permits, projects have to interact with various permitting authorities, which have been grouped in four categories: local government, regional government, national government and government agencies. This classification is a simplification of the diverse institutional settings present across Europe, yet it enables a structured and meaningful analysis of the administrative levels involved.

Figure 11 presents the percentage of projects that had to interact with each of the four administrative levels for obtaining permits; it should be noted that projects could report that they interacted with more than one authority type. A large majority of the projects interact with the local government (83%) and/or the regional government (73%). In addition, government agencies (e.g., water authorities) and national governments are involved in the process for almost half of the projects.

Figure 11. Percentage of projects interacting with each administrative level



It is interesting to note that only three projects reported that they had to interact only with the national government, while seven indicated the regional government and other six indicated the local one as their only interlocutor. In addition, 20 projects reported that they interacted only with the regional and the local governments. These results underline further the central role that the regional and local dimensions play in granting the necessary permits. The other respondents interacted with both the national and/or the local and regional governments, except of course the small minority that had no interaction as they did not need permits.

Regarding their experience of interacting with permitting authorities, 79% of projects reported that there are structured processes in place for timely engagement with authorities before and during the permitting process. As it will be detailed in Section 5, the issues with permitting authorities seem thus not to be related to the absence of such processes, but rather to other, more complex issues.

With regard to the modality of the interaction with the authorities, three aspects have been singled out in the survey with dedicated questions: (i) the **digitalisation** of the process, (ii) the availability of **one-stop shop** or a **single point of contact** ([15]) and (iii) the participation in a **regulatory sandbox** which allows companies to deploy innovations within a simplified regulatory scheme.

3.2.1. The degree of digitalisation

Digitalisation is a vital tool in facilitating permitting procedures and has been recognised as such in EU policy. For example, the Commission Recommendation 2024/1343 on speeding up permit-granting procedures for renewable energy and related infrastructure projects ([16]) called on Member States to introduce access to "fully digital permit-granting procedures and e-communication" by November 2025. Similarly, the Draghi report on EU competitiveness ([17]) concluded that greater focus is

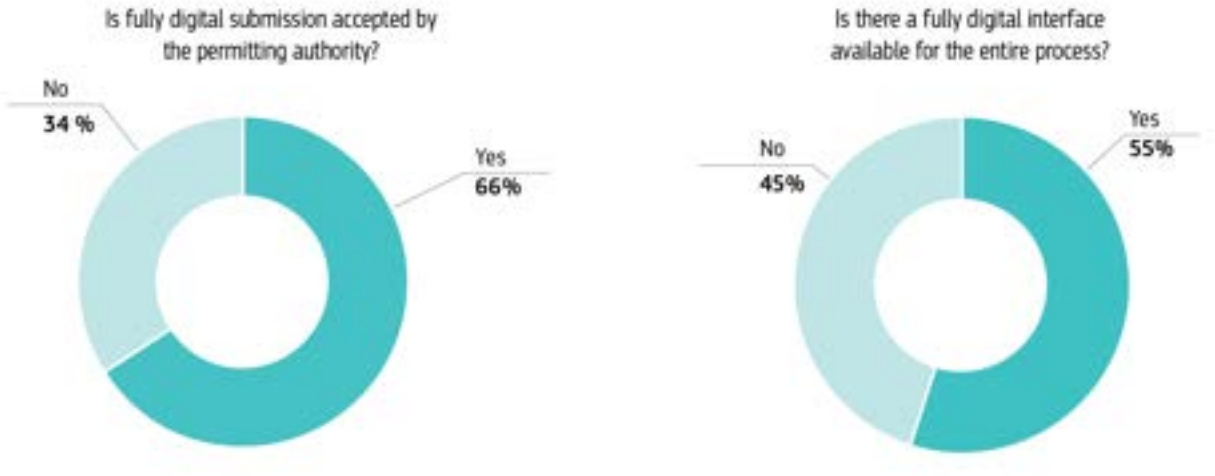
([15]) While there is no common definition across sectors, a one-stop-shop is generally understood as a centralised platform through which all permits and authorisations required for a project are processed, or at least streamlined, by offering a single point of contact for applicants. A one-stop shop or a single point of contact can facilitate permitting, aiming to shorten and smooth the permitting process.

([16]) Commission Recommendation (EU) 2024/1343 of 13 May 2024 on speeding up permit-granting procedures for renewable energy and related infrastructure projects: https://energy.ec.europa.eu/publications/recommendation-and-guidance-speeding-permit-granting-renewable-energy-and-related-infrastructure_en

([17]) The Draghi report: A competitiveness strategy for Europe, 9 September 2024: https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en#paragraph_47059

needed on digitalising permitting processes across the EU. Consequently, this aspect was explicitly covered in the survey with two dedicated questions, and the results are depicted in Figure 12.

Figure 12. Replies from the surveyed projects to the questions on digitalisation



The respondents declared that in two thirds of the cases they could submit their permit applications fully online. It is thus clear that digitalisation is widespread across the numerous authorities involved in the permitting processes across countries. On the other hand, it is also evident that digitalisation is not yet fully employed: it is not possible yet to submit a fully digital permit application in about a third of the cases, and as shown in the graph on the right of Figure 12, in almost half of the cases, the interaction with the permitting authorities is not supported by a fully digital interface along the whole permitting process. It is noteworthy that projects appreciated the availability of digital tools and called for a further deployment of them, as it will be detailed in Section 8.

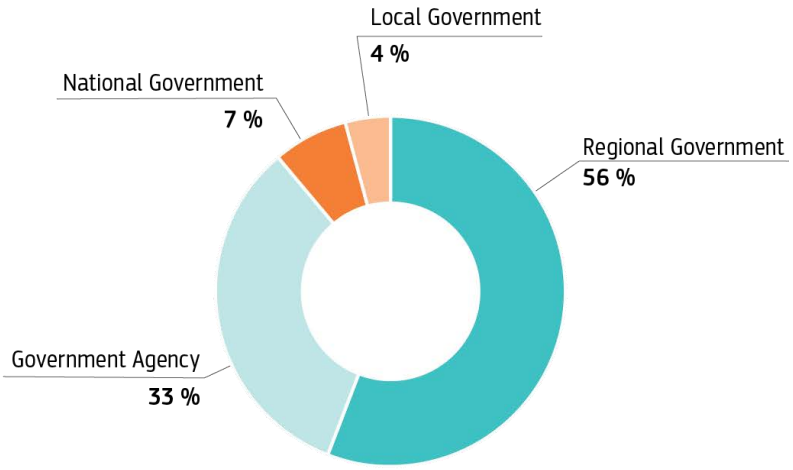
3.2.2. One-stop shops and single points of contact

The permitting process can be facilitated when a **one-stop shop** or a **single point of contact** are available for the administrative management of permits. This is the reason for the call within the NZIA regulation for Member States to ensure that net-zero project promoters interact with a single point of contact.

The survey results suggest that this solution is not yet widely available. This is noteworthy because, as detailed in Section 5, the high number of authorities that projects have to interact with is indicated as a challenge by IF projects (second in order of importance). It is thus clear that projects would significantly benefit from the coordination and simplification offered by a one-stop shop or a single point of contact. Around a **third of the surveyed projects** have benefited from the existence of a one-stop shop or a single point of contact in their region or country. 74% of those one-stop shops or single points of contact are reported to be mandatory for applicants to interact with, meaning that they are not designed as a support instrument but rather that they are meant as the designated gateway to obtain the permit.

Most of the one-stop shops or single points of contact are established at regional level (56%) and around a third are related to a government agency (Figure 13). Interestingly, a specific country has been indicated as offering a one-stop shop or a single point of contact by some projects, but not by others. This apparent contradiction can be easily explained when analysing the results by sectors and/or regions: it is observed that the availability of the service is not dependent on the Member State a project operates in, but rather on the specific locality and sector (e.g., in a given locality a one-stop shop can be available for wind energy projects but not for manufacturing ones). Only in the Hydrogen cluster, a majority of respondents declared that they could take advantage of this opportunity; projects in all other clusters generally reported that this was not the case, particularly those in Renewable Energy and Energy Storage.

Figure 13. Administrative level at which the one-stop-shop or single point of contact is established



3.2.3. Regulatory sandboxes

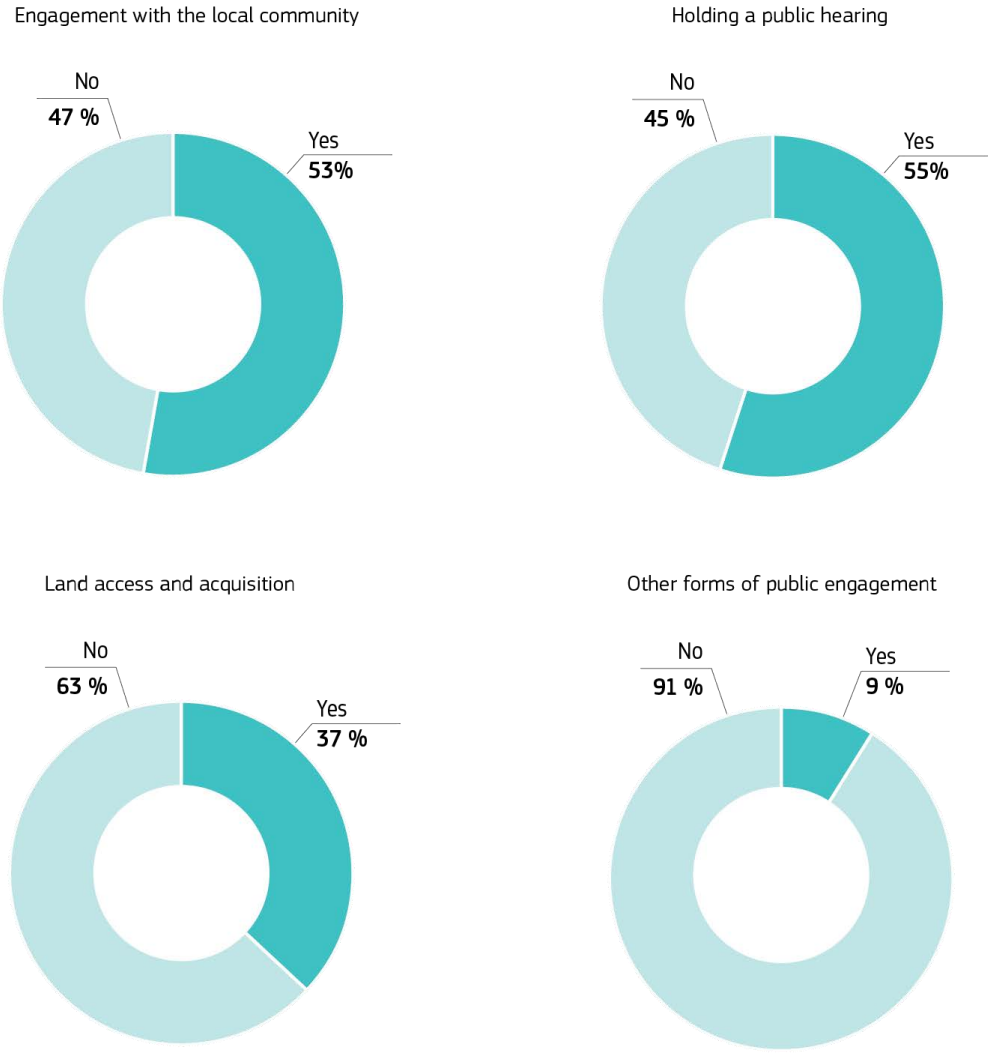
Only a small number of projects (5) participating in the survey reported that they benefited from a regulatory sandbox. This result per se is not surprising; only some projects can apply for such a scheme, because the application is dependent first on the availability of the scheme for their specific sector and locality, and second on their innovative profile: regulatory sandboxes are designed for testing new solutions rather than for supporting established technologies, thus only highly innovative solutions are eligible. On the basis of the survey feedback and of the qualitative input gathered during the knowledge sharing workshops, it can be stated that the use of regulatory sandboxes is appreciated by IF beneficiaries and beneficial for their operations. The same can be said of other special regulatory regimes designed for new solutions, such as the possibility to start operating on the basis of a provisional permit with the commitment to provide, within a given timeframe, the additional data generated by a pilot installation in order to obtain the full permit. This finding is all the more important for the future, because the number of IF projects financed under the Pilot topics of the IF calls has been growing in the last years. These pilot projects are less technologically mature compared to large-scale or medium-scale projects and are therefore more likely to benefit from the use of a regulatory sandbox or other permitting procedures dedicated to an earlier development phase.

3.3. Relations with the public

As shown in Figure 14, engaging with the public is a common activity, and often a requirement for IF projects. Slightly more than half of the respondents indicated that engaging with the local community was a requirement during the permitting process. This demonstrates that community involvement is often a fundamental component of permitting; most commonly, this is required within the environmental permitting procedures, such as during the production of the impact assessment. A similar share of respondents (55%) reported that they were required to hold a public hearing, i.e., a formal meeting open to the public where they present information about their project and allow members of the public to provide their opinion. More than a third of respondents had to engage with the public in order to acquire the necessary land or the required land access rights. Lastly, almost one respondent in ten had to work on other forms of engagement with the public. Such cases were useful to understand that at times projects needed to engage in very specific relationships with the public depending on the

local context. For example, projects cited the need to make all documentation available to the public for a given time, consult with indigenous (in addition to local) communities, or be involved in local court proceedings.

Figure 14. Share of projects having to engage with the public in different ways



In summary, it becomes apparent that relations with the public play a crucial role in the management of IF-funded projects, especially those which need to build new installations or infrastructure. Namely, referring to the numbers presented in Figure 2, generally the projects which did not need new permits or just to update existing ones, also did not report the need to engage with the public. The reason is that they operate within existing installations and thus had already performed the necessary public engagement activities prior to the IF project start. Conversely, the projects building new installations or infrastructure overwhelmingly reported the need to interact with the public. An additional analysis of the relations with the public is outlined in Section 5, where the focus is on the impact of the interactions with the general public.

4. THE EFFORT REQUIRED AND THE IMPACT OF PERMITTING

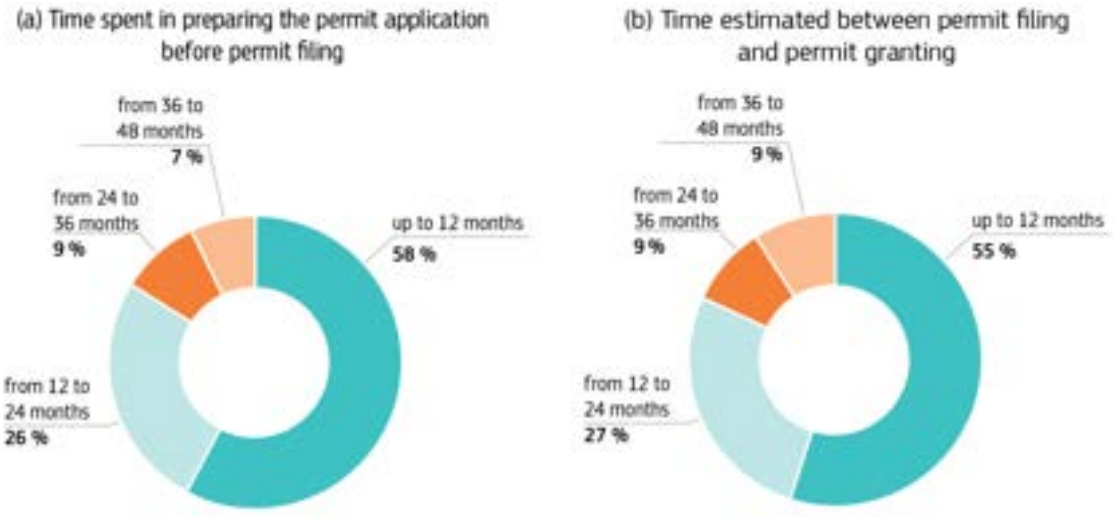
As depicted in Figure 3, the permitting process is considered a major challenge for project development. This section attempts to measure the magnitude of the challenge projects face in obtaining the permits. First, an estimation of the effort the respondents required to meet the challenge will be presented. This estimation is based on the questions asking to quantify the level of effort projects needed to secure the necessary permits in terms of time, personnel and expenses. Second, the impact of the permitting challenges will be analysed, with a focus on the risk of delays due to the permitting duration. The results provide a better understanding of the situation, translating the permitting challenge into more concrete terms.

4.1. Time required

Projects reported an average duration of 16.1 months from the moment they started working on the permit preparation to the moment the permits were submitted to the relevant authority. Most projects (58%) required (or expect to need) one year or less before completing the permit application, and about a quarter spent (or expect to need) between one and two years (Figure 15). Only 16% of projects needed more than two years from the start of the preparatory work to the submission of the permit.

The time projects required (or expected to require) for obtaining the permit/ application filed was similar, lasting 16.4 months on average. As shown in Figure 15, similar trends are observed with regard to the expectations of the process after filing: most projects expecting to need up to 12 months between the first permit filing and the finalisation of the process. However, almost 45% of projects expected permits to take longer than the current NZIA strategic project requirement of one year.

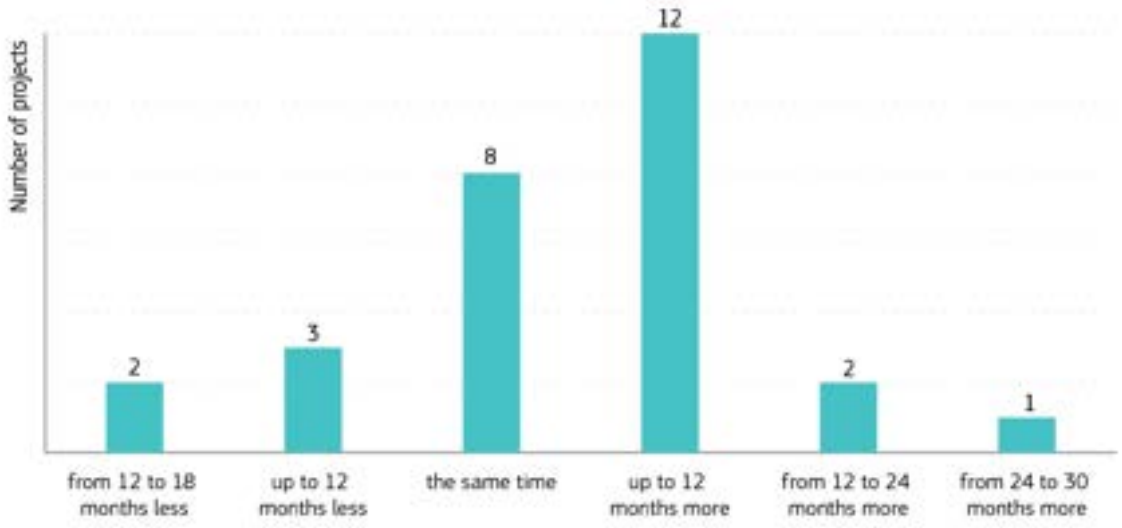
Figure 15. (a) Time spent on the preparatory work before filing the permit with the relevant authority; (b) Time estimated to be required from the first submission to the last permit(s) being granted



The projects that had obtained the necessary permits at the time of the survey (28) spent an average of 18.3 months from the first permit submission to the time the permits were granted, with a quarter of the projects needing more than 2 years to acquire all the permits. For projects that obtained all required permits, it is interesting to compare their predicted timelines

with the actual time they needed to finalise the permitting process. Figure 16 shows the difference between the time projects required and the time they had estimated for the granting of their permission(s).

Figure 16. Difference between the time that projects needed for the permission granting and the time projects had estimated (only for the projects whose permitting procedure was finalised)



More than half of the projects required more time than they had anticipated, although most of them (12) required less than one additional year to have their permits granted. Eight projects waited the same amount of time as they had estimated, and only five projects were pleasantly surprised as the process was swifter than expected. Within the group of 28 projects, all biofuels and biorefineries projects (3) and chemicals projects (3) needed more time for the permitting process than anticipated. It should be noted that, as the projects participating in the survey were awarded the IF grant between late 2021 and late 2023, these results are likely to be skewed towards projects with shorter permitting periods.

4.2. Costs and personnel required

With regard to the personnel effort, projects replied that on average around four full-time employees were involved in preparing permitting documentation and overseeing the permitting process. Several projects commented that they had to increase the personnel (internal or external) dedicated to permitting over time.

Regarding the costs involved in obtaining the necessary permits, it was not possible within the limited context of the survey to ask respondents to follow a common, but complex quantification methodology such as the EU standard cost model ([18]). However, projects were asked to provide a reasonable estimate; their replies range from a few thousand euro to over a million euro in cases where the project is at risk of being cancelled due to permitting issues, thus putting at risk the investments already made. This result is a clear reflection of the wide range of situations present in the sample, with some projects not needing to work (significantly or at all) on permitting, and others having to devote substantial resources to it.

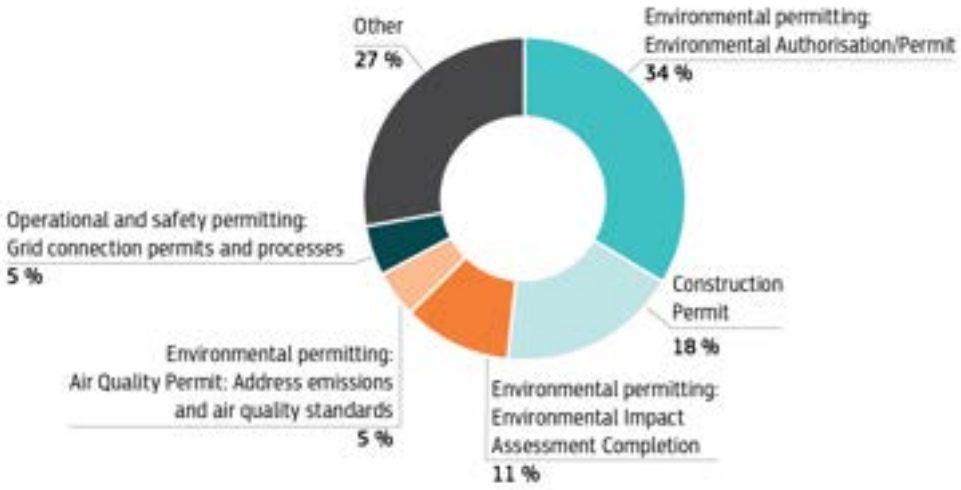
([18]) Described in Better Regulation: guidelines and toolbox: https://commission.europa.eu/law/law-making-process/better-regulation/better-regulation-guidelines-and-toolbox_en.

4.3. The most burdensome permitting procedures

In addition to describing the efforts devoted to permitting, projects were asked to select and rank the five specific permits (see Table 1) that imposed the greatest burden.

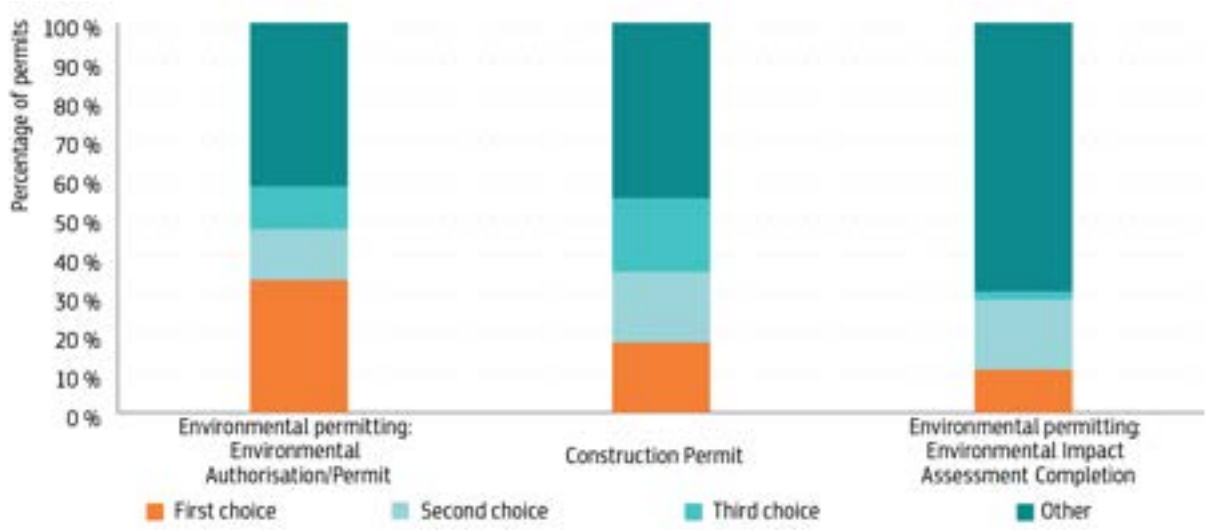
The results presented in Figure 17 indicate that the environmental authorisation/permit is overwhelmingly perceived as the most burdensome and time-consuming, consistently ranking first among a third of the respondents. This is followed by the construction permit and the environmental impact assessment completion permit which were frequently placed in the top three, highlighting their significant administrative complexity and lengthy preparation and approval processes. The air quality permit and grid connection permit are in fourth and fifth place, suggesting that while they may not be as challenging as the top-ranked permits, they still require considerable effort.

Figure 17. Permits identified as the most burdensome and/or time-consuming by respondents



From an alternative perspective, when analysing the pattern of choice for each of the top three most burdensome permits, the survey results highlight a slightly different proportion. The environmental authorisation/permit is the most frequently mentioned, with 58% of respondents ranking it amongst the first three choices, as described in Figure 18 (the category "other" in the figure represents all other permits in the sample beyond the top three). The construction permit follows, with 55% of respondents selecting it as the first (18%), second (18%) and third (19%) most difficult permit. Undertaking a environmental impact assessment ranks as the most burdensome permit for 11% of respondents and appears as the second choice for 18% of respondents and for 2% as the third, totalling almost a third (31%) of respondents that consider it as one of the top three most burdensome.

Figure 18. Permits most often identified as among the three most burdensome to obtain



4.4. Burdensome versus cumbersome permitting procedures

In addition to identifying and ranking the most burdensome permits, projects were asked to indicate which permit was the most cumbersome. Burdensome typically reflects the sheer effort needed to obtain a permit, which can translate into substantial amounts of personnel, time and resources deployed to comply with complex regulatory requirements. Cumbersome, on the other hand, implies a perception of inefficiency, inconsistency, or unnecessary complexity in the process itself.

About two thirds of the respondents indicated that the permit they found most cumbersome fell in the environmental permitting category; this share raises to three quarters when adding the respondents who found environmental permitting most cumbersome together with a permit from another category. Within the environmental permitting category, a significant majority highlighted the environmental authorisation/permit as the primary challenge, which is very much in line with the responses provided to the 'burdensome' question. However, a significant number of projects referred to very specific environmental permitting procedures that are only relevant to their particular product or process, from water treatment to noise or the measurement of specific pollutants.

The overlap between respondents' perceptions of environmental permits as 'burdensome' and 'cumbersome' suggests that these procedures are not only seen as time-consuming and resource-intensive but also require further analysis to identify opportunities for streamlining. The fact that environmental permits are consistently rated high in both aspects underscores a critical problem: not only do these permits require considerable effort on behalf of the respondents, but such effort is often perceived as unjustified or avoidable. This dual challenge highlights a need for structural reforms in the permitting process, such as streamlining procedures, improving coordination between authorities, and enhancing transparency in requirements.

In a number of cases, respondents underlined that the procedures were cumbersome because they were not designed specifically for their innovative solution; this aspect will be detailed in Section 5.2.

4.5. The potential impact on the project schedule

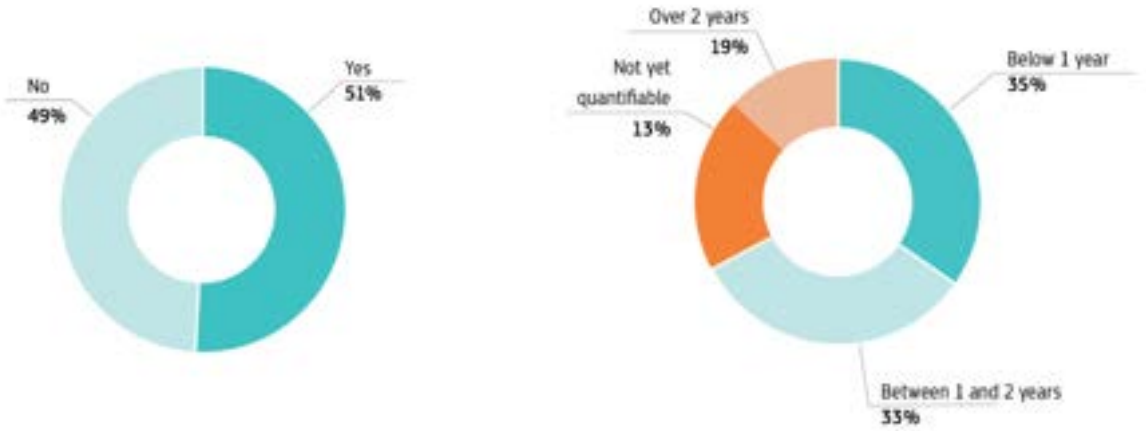
On the basis of the results illustrated above, it emerges clearly that permitting is a major challenge for IF projects: substantial efforts are required in terms of time, personnel and financial resources. One of the most important success factors for the IF projects is their ability to respect the schedule as envisaged at the planning stage, which is a condition for grant disbursement. Delays in the schedule of industrial projects impact not only operations but also the financial planning.

In particular, delaying the start of operations results in revenue streams being deferred and extends the period during which interest costs accrue. This often necessitates acquiring additional financial resources and, in some cases, can so severely impact the project's economics that it becomes unviable. Moreover, respecting the project schedule is particularly vital for IF projects because they are legally committed to reach FC within four years after grant signature. Therefore, a significant delay in permitting can lead to the project termination, if as a consequence it pushes the FC date beyond the legal threshold of four years since project signature date.

Projects were also asked if they were at risk of being delayed (potentially impacting the target date for FC and/or EIO) because of difficulties in obtaining the required permits. Around half (46 out of 90) of projects replied positively to the question, as depicted in Figure 19. This share is very high, considering that many projects were still at the early stages of their cycle (those submitted as proposals to the 2022 calls and signed in late 2023) and thus unlikely to have already encountered issues. It suggests that the acquisition of permits is a common cause of delays.

Additionally, projects quantified the potential delay due to permitting issues. The impact is generally large, as shown in Figure 19. Out of the 46 projects at risk of delay, 21 estimated that the potential delay was equal to or greater than 12 months, while 16 considered it to be less than one year. In six cases, the delay was assessed to be greater than 24 months, which would put the project at risk by pushing it close to or beyond the four-year FC deadline. The remaining projects replied that, although they anticipated a delay, they were not yet able to quantify it.

Figure 19. (a) Share of projects at risk of delay due to permitting; (b) Estimated duration of the delay



5. IDENTIFYING THE CHALLENGES

In the survey, the projects identified the main challenges they experienced related to permitting. The results are illustrated in Table 2, and will be interpreted in the light of the replies to other questions, particularly the open questions in the survey where respondents could explain the specific situation of their projects in more detail, and on the basis of the more qualitative feedback from the workshops.

Table 2. Main challenges related to permitting procedures identified by respondents

Challenge	% projects
The amount of time required to complete the procedures in relation with the project deadlines	60%
The high number of public authorities involved in the permitting procedures	51%
The uncertainty about the result of the application (i.e., the risk of not obtaining the permits)	48%
Lack of expertise/human resources in the permitting authority/ies	44%
The time-consuming and complex Environmental Impact Assessment requirements	44%
The novel nature of our operations, which does not fit well in the existing permitting procedures	43%
The number of documents required to file the permitting requests	41%
The administrative effort required to complete the procedures	40%
The lack of existing legislation applicable to the project's sector	30%
Identifying all the relevant permits needed for the project to operate	28%
Communication and collaboration with local permitting authorities	25%
Time-consuming public consultation procedures	23%

5.1. The scale of the effort

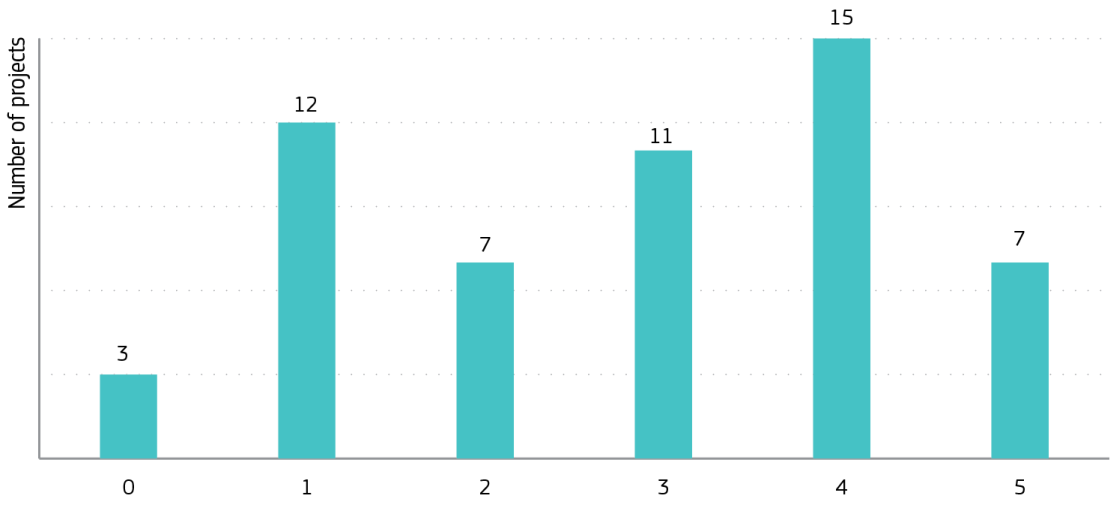
The results clearly indicate that the scale of the effort required is in itself a root cause of the difficulties in the permitting procedures. In particular, the most commonly reported challenge is the amount of time needed, followed by the number of authorities with which a project must interact; the two elements underscore that a major and complex effort is needed. Similarly, also the complexity of conducting an environmental impact assessment and the high number of documents required suggest that a very substantial effort is required. The respondents' perception on the main challenges related to permitting thus chimes well with the observations on the quantification of the effort projects invest in terms of time, personnel and resources, presented in Section 4. For most projects, acquiring the necessary permits is a complex endeavour that demands considerable effort; this can represent a serious challenge in itself. However, a more attentive analysis, combined with the qualitative feedback provided by the respondents, suggests that the sheer amount of work is only one aspect of the broader explanation. Additional important factors emerge.

5.2. Novelty of the technologies and solutions

Most significantly, it emerges clearly that many of the issues reported are due to the novelty of the solution that will be implemented. 43% of the respondents identified as a challenge the fact that the novel nature of their solutions does not fit well into the existing permitting procedures, and almost a third of projects indicated the lack of existing legislation as one of the main challenges. Moreover, the lack of expertise/human resources in the permitting authorities – cited by 44% of respondents – is also often related to the novelty of the solutions.

Specifically, the fact that the project setup is a first of a kind can have an impact on the permitting procedures. 64% of the projects in the survey consider identified themselves to be first-of-a-kind for the permitting authorities. When asked to assess the institutional capacity of the permitting authorities for evaluating their projects, over a quarter of them evaluated it as "low" or "very low" (Figure 20). It is understandable that the authorities' capacity is superior for existing and proven technologies; as the same time, it is also clear that additional efforts are needed to facilitate the deployment of innovative solutions.

Figure 20. Assessment of the institutional capacity of the permitting authorities by first-of-a-kind projects



Answers ranging from 0: very low capacity to 5: very high capacity

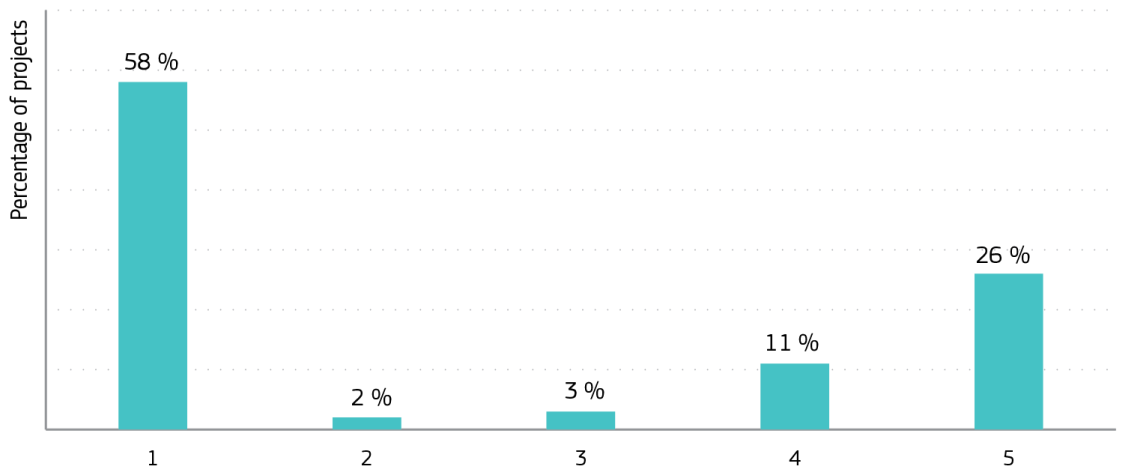
In addition, as reported above, challenges in processing the permitting application may stem from the lack of a well-defined permitting procedure for a new technological solution or, more generally, the lack of specific legislation. For example, the permitting procedures for existing technologies are typically based on detailed regulations and well-defined parameters. Consequently, the permitting of new technologies, for instance using oxyfuel combustion instead of air combustion in a cement kiln, is often hampered as the existing procedures are based on the parameters of the 'traditional' solution (e.g., the Best Available Technologies), which do not always correspond well with the parameters of the new solutions. Specifically, multiple hydrogen projects report having to operate without a specific dedicated legislation, which forces them to file their permits adapting their request to regulations developed for other sectors, increasing the complexity of the process. For projects introducing new circular processes (for example, valorising hitherto unexploited waste streams), the challenge often arises from the lack of harmonised standards and the different interpretation of rules at the national and the regional level. In particular, the end of waste regulations and the classification of materials as by-products are reported as being implemented differently across the EU, which causes difficulties in obtaining the necessary authorisations and permits to source, process or market the material.

5.3. Permits beyond the Innovation Fund projects' scope

Importantly, permitting issues that lay outside of the boundaries of an IF project can nevertheless impact it. Notably, almost half (47%) of the respondents stated that the success of their project depends on permitting for activities or infrastructure that are outside of the project scope. The most common case (reported in 25 instances) involves power supply infrastructure outside the project scope, such as the construction of a high-voltage power line, a transmission station or a connection to the grid. In addition, the success of several projects (13) depends on the timely completion of carbon transport and storage infrastructure that falls beyond their remit and control, for example the construction of CO_2 pipelines or storage sites. The reliance on the completion of a hydrogen pipeline was mentioned by 4 projects, while another 8 projects depended on permitting procedures related to very specific installations, such as the construction of a plant for the off-taker of their product or the development of a district heating network.

Permitting issues affecting these 'external' activities can have a potentially strong impact on the timeline, or even on the viability, of some projects: 23 projects (26% of the sample) reported being subject to a potentially very high impact of permitting issues outside their control, while another 10 projects reported a high impact, as illustrated in Figure 21. This fact indicates clearly that projects contributing to the transition to a carbon-neutral economy require an efficient regulatory framework beyond their own activities; they depend on the regulatory conditions affecting external factors such as access to electricity or the availability of infrastructure for CO_2 and hydrogen.

Figure 21. Severity of the impact of issues with external permitting procedures

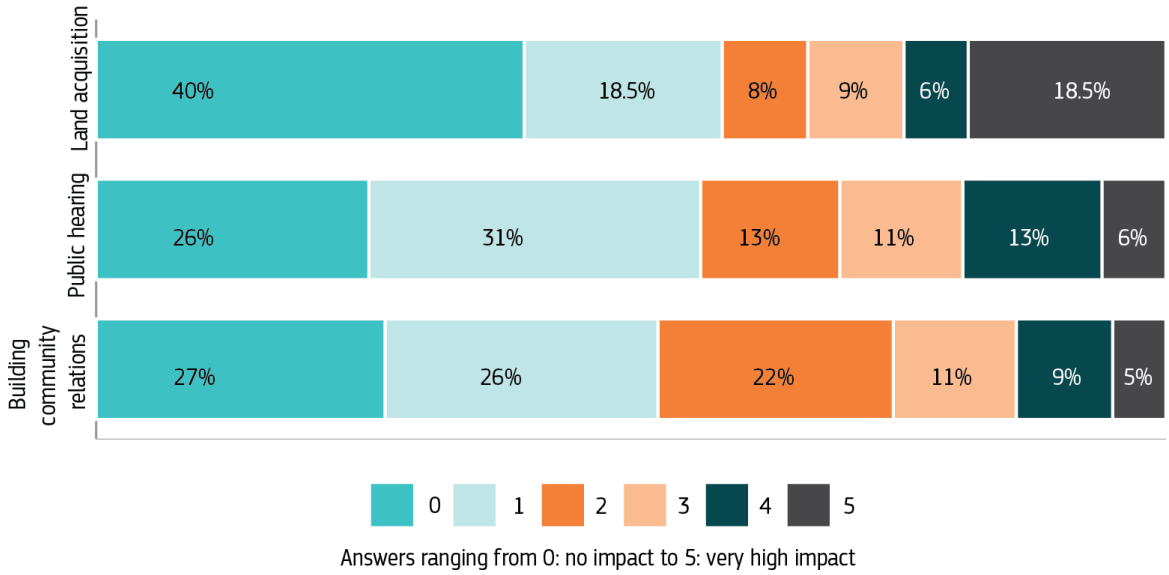


5.4. Relations with the public

As part of the permitting process, projects often engage in activities to strengthen their relations with the public or are mandated to do so by the procedures in place. Such additional activities, which are detailed in Section 3.3, were generally not reported as being very impactful. Engaging with the community, organising a public hearing or acquiring land are seen as of "no" or "low impact" by most projects (Figure 22). Nevertheless, while most projects did not report significant challenges in this area, it is noticeable that among those which did, a substantial share considered that the impact on the project would be high or very high. In particular, 12 projects estimated that land acquisition was a serious challenge, potentially having a very high impact on the permitting process. Similarly, about a project in five reported difficulties in conducting the public hearing that was mandated by the permitting procedures. The qualitative feedback from the survey and the information

gathered in the workshops confirm this finding; issues with the local acceptance of a project, or the inability to convince the right holders to grant land access or acquisition, have the potential to substantially delay a project or even to make it impossible to carry forward.

Figure 22. Assessment of the impact of public relations activities on the permitting process.



5.5. Interdependency and sequentiality

The interdependency of different permitting procedures and the need to work sequentially (i.e., the need to obtain a permit before starting the procedure to obtain another) can cause delays and have a chain effect on the project development timeline. A good example are land use permits, which play a vital role in the successful completion of projects, as they grant authorisation for the use of a specific surface area. Many of the other permits required are contingent upon obtaining the land use permits, which are often intertwined with environmental authorisations. This can create a sequential dependency, that is, permits cannot be processed simultaneously, as the outcome of the first one may impact the other. Similarly, other authorisation processes are also subject to interdependencies, which can limit opportunities for streamlining and expediting the permitting process due to the need to wait for preceding approvals. For example, a RES project reported that only after obtaining a licence (specific to their sector) for site investigation they would be in a position to proceed with the environmental impact assessment, followed by the planning application, and only afterwards it was possible to submit a grid connection permit. While there are good reasons to require some permits and authorisations before others, it is also clear that sequentiality increases not only the time required but also adds uncertainty to project timeline and overall development.

6. ANALYSIS BY PROJECT CLUSTER

The surveyed projects are classified in the following primary clusters:

- Energy-intensive industries (EII)
- Hydrogen
- Industrial carbon management (ICM)
- Renewable energy (RES)
- Energy storage (ES)

Energy-intensive industries include the sectors listed in Annex I of the EU Emissions Trading System (EU ETS) Directive, such as refineries, iron and steel, non-ferrous metals, cement and lime, glass, ceramics and construction materials, pulp and paper and chemicals, excluding the hydrogen sector which is analysed separately.

The **Hydrogen** portfolio comprises projects that focus on the production of renewable and low-carbon hydrogen, along with projects that aim to establish manufacturing capacities for equipment used in hydrogen production facilities.

The **Industrial carbon management** portfolio addresses all elements of the carbon value chain across Europe: CO_2 capture, transport, utilisation and storage.

The **Renewable Energy** cluster consists of projects that focus on manufacturing or deploying innovative technologies for solar energy, wind energy, geothermal energy, ocean energy and other renewables that are not included in Annex I of the EU ETS Directive.

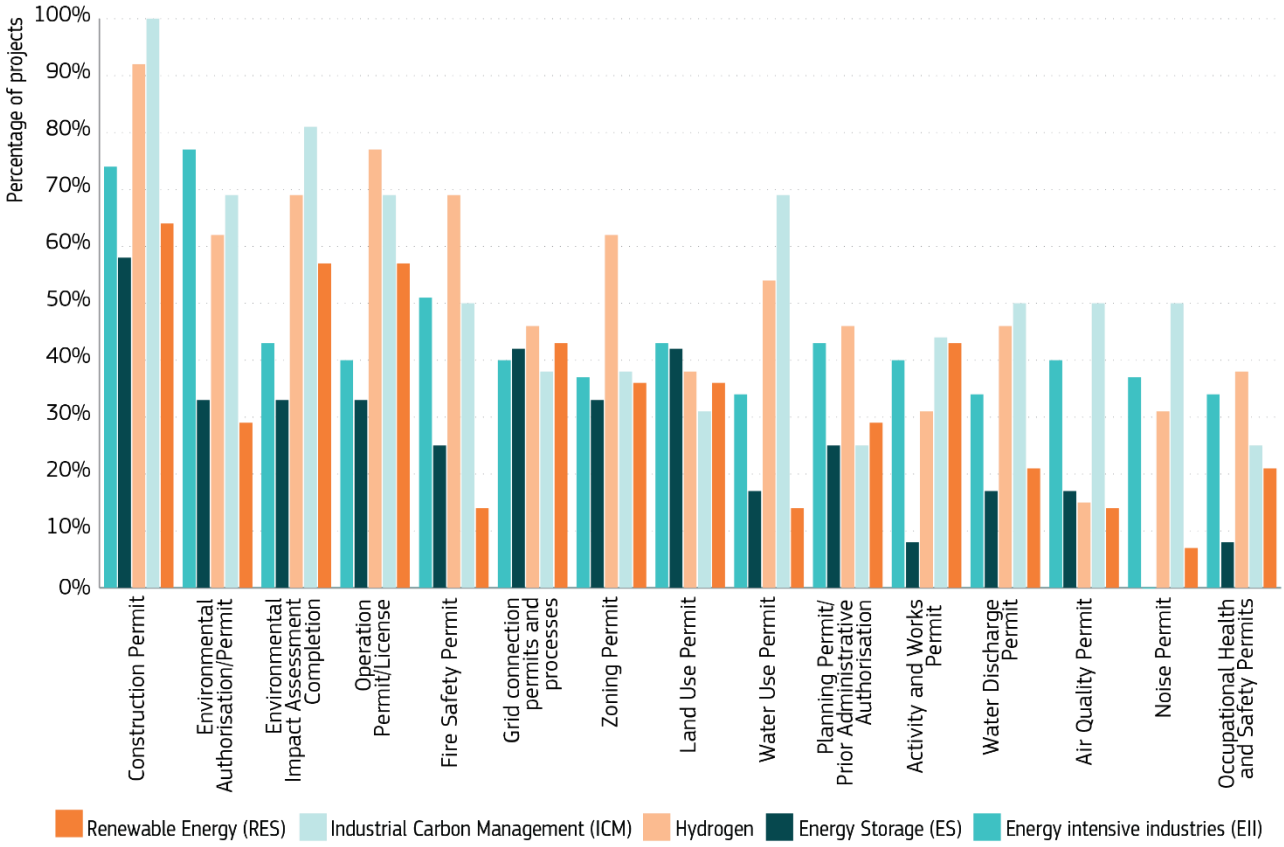
The **Energy Storage** projects aim to advance and deploy technologies in battery manufacturing and recycling and energy storage solutions (including heat storage and grid energy storage).

The share of the five clusters within the survey sample is presented above in Figure 5.

Specific permits required in the clusters

The following analysis examines the specific permits that projects indicated as required for their operation, for each of the five clusters. Figure 23 illustrates a comparison of the specific permits needed across the clusters: the top 15 permits are reported, with the values normalised by the number of permits per cluster. The permits most frequently flagged by the respondents are distributed differently depending on the project's cluster. While for the energy-intensive industries cluster the most frequents permits are the environmental authorisation, the construction and the fire safety permits, for the Industrial Carbon Management projects, for example, construction permit ranks first (with a 100% share of positive replies coming from the cluster), followed by the environmental impact assessment completion and the third place being equally split between the environmental authorisation, operation and water use permits.

Figure 23. Top 15 most frequently selected permits and their distribution across clusters



The figures from Figure 24 to Figure 28 provide an overview of the specific permits most frequently reported by projects in each cluster. Each figure shows the percentages of projects within the cluster that require a specific permit, presented from the most to the least frequent. This overview offers insights into each cluster, which are discussed further in the following subsections. In addition, the data allow for a relative assessment of the clusters in terms of the prevalence of specific permits and their ranking within each cluster. For example, grid connection permits and processes are the third most required permit in the ES cluster, but only the eighth one in the EII cluster. At the same time, this specific permit is reported by 40% of projects for both clusters. This again shows that, in general terms, the ES projects require less permits than the EII projects, and further indicates that, within the required permits, grid connection permits and processes represent a proportionally larger share of the total in the ES cluster.

It is noteworthy that no specific permit within the main categories of transport and additional local permits appears among the most frequently required ones. The absence of the transport category may seem surprising; this is because transport-related permits represent only 4% of the total number of permits reported. In addition, the survey included eight specific permits for transport, depending on the transport mode (road, rail, maritime, inland water) and the nature of the goods transported (standard, hazardous, dangerous); the number of each of those specific permits reported as required was too low to figure amongst the top 15 in any cluster. Similarly, the additional local permits category is not represented, as it included very specific local permits that were relevant for the single project but not for the cluster as a whole.

Figure 24: Most frequent permits flagged in the Energy-intensive industries (EII) cluster

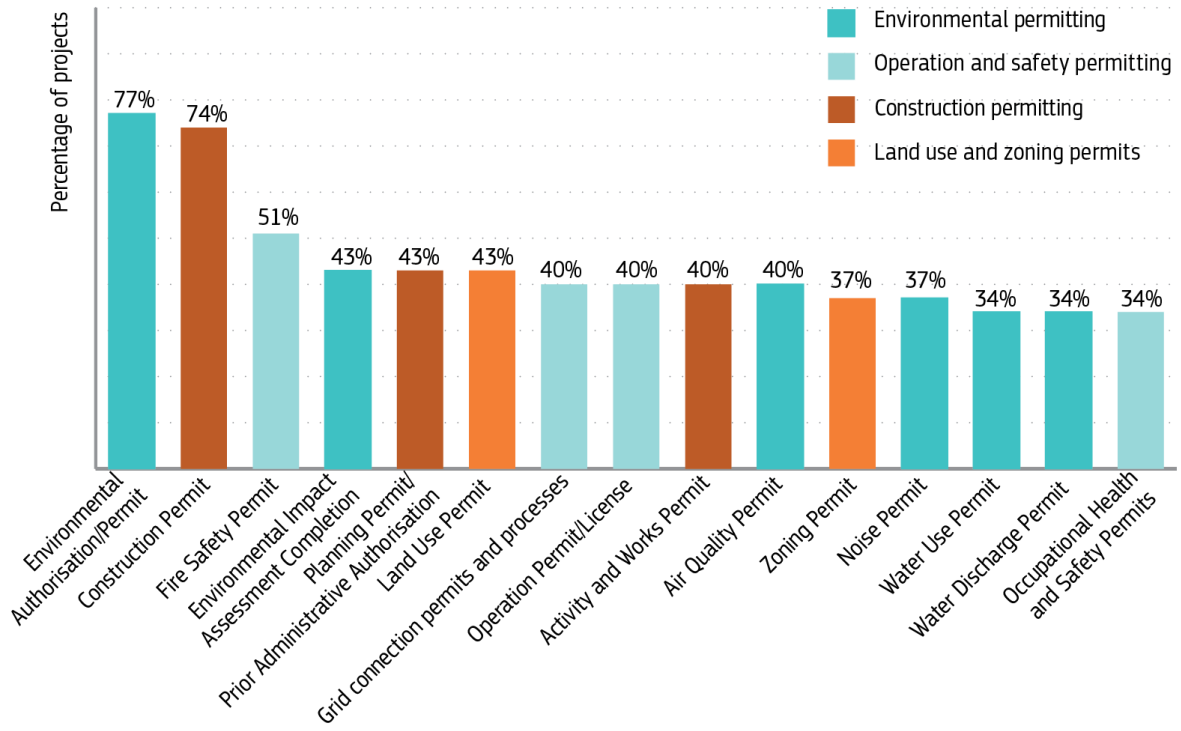


Figure 25: Most frequent permits flagged in the Energy Storage cluster

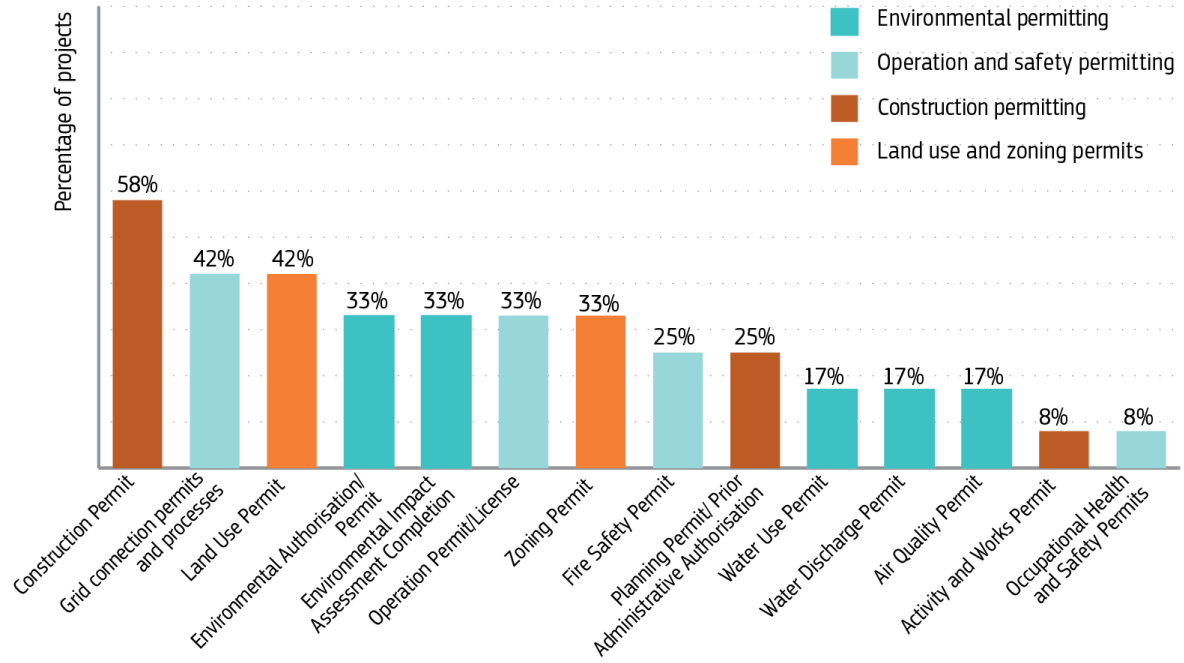


Figure 26: Most frequent permits flagged in the Hydrogen cluster

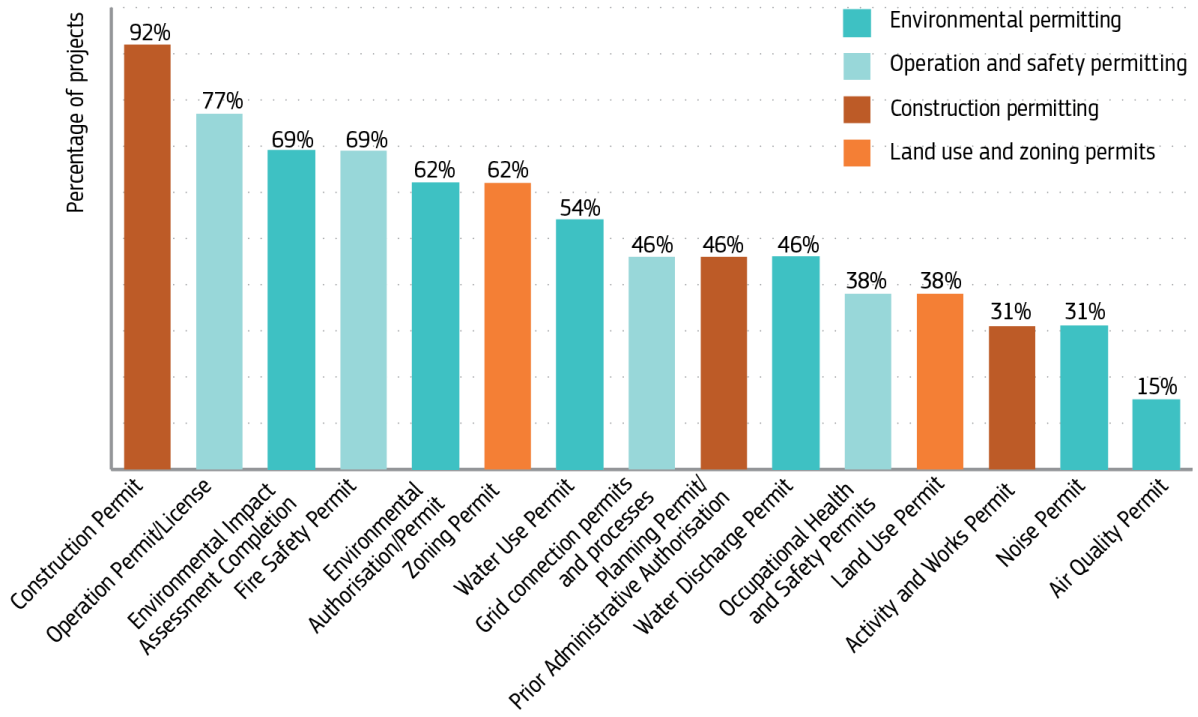


Figure 27: Most frequent permits flagged in the Industrial carbon management (ICM) cluster

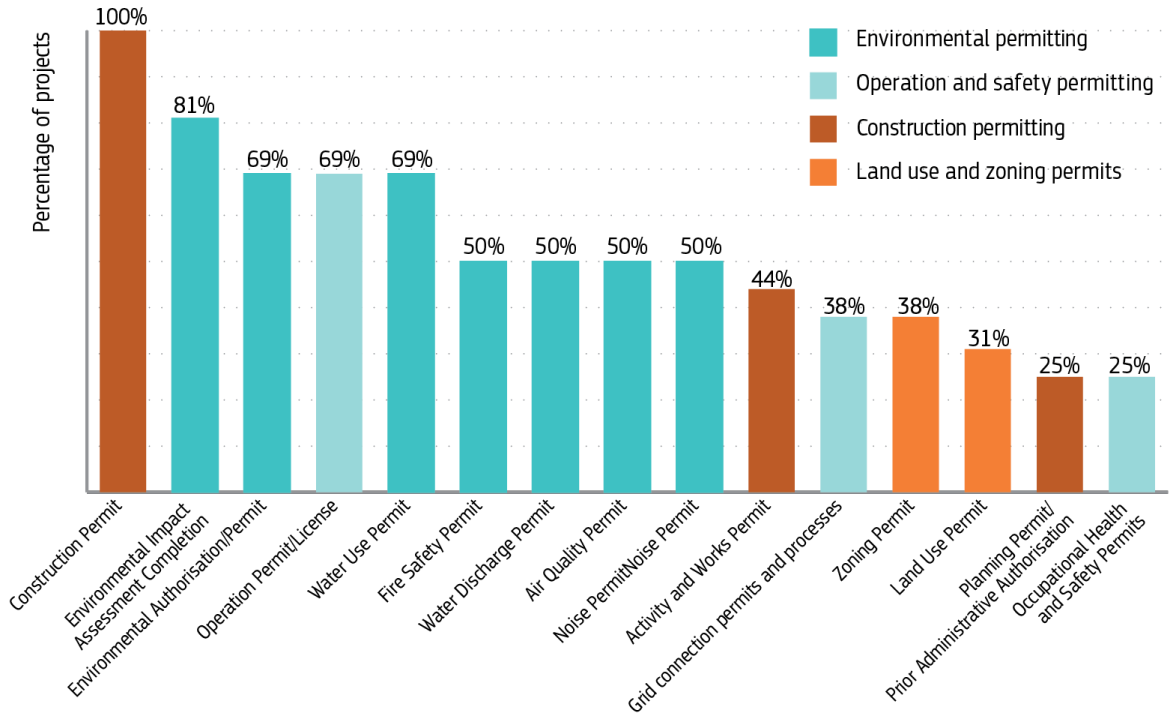
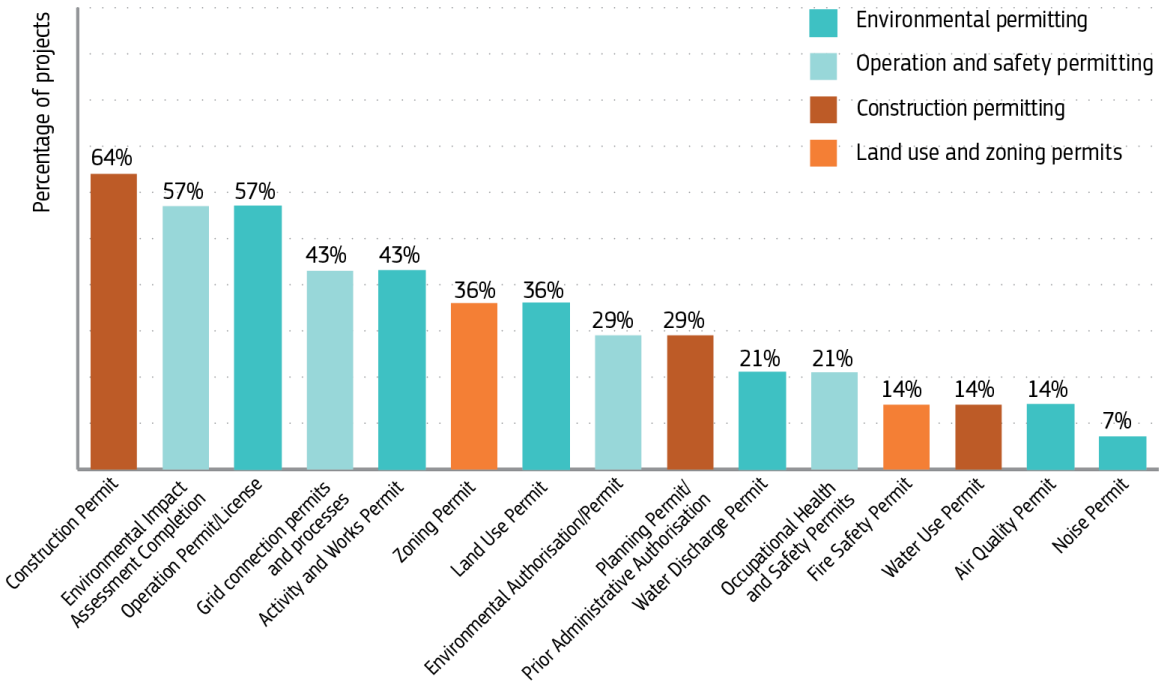


Figure 28: Most frequent permits flagged in the Renewable Energy (RES) cluster



6.1. Energy-intensive industries (EII)

The decarbonisation of energy-intensive industries is key to meet EU climate goals. The projects in the EII cluster use a variety of technological pathways to decarbonise their processes, including CCS, CCU, waste and residues use, electrification or use of hydrogen. It should be noted that for this report, projects focusing primarily on CCS and CCU solutions are included the ICM cluster (see Section 0).

35 projects on energy-intensive industries filled in the survey on permitting. These are projects in the non-ferrous metals (2), glass, ceramics and construction materials (8), biofuels and bio-refineries (3), chemicals (10), cement and lime (2), refineries (4), iron and steel (5) and pulp and paper (1) sectors.

Within the surveyed projects, 18 projects are small-scale, receiving IF grant amounts between one and five million euro; the largest number of these projects are in the glass, ceramics and construction materials sectors. On the other hand, 17 projects are large-scale, with over half of them in the chemical sector; their CAPEX typically exceeds 100 million euro, reaching up to 5 billion euro, with the highest investments concentrated in the chemical and steel sectors. At the time of the survey, less than half of these projects had reached FC and only a few had started operations.

The following points have emerged as particularly important for the EII cluster.

Only two projects did not report the need for permits, while the **vast majority required the approval of new permits**, often involving also the update of existing ones. Moreover, a high proportion of the EII projects (27) considered permitting as the main challenge, or among the top challenges, for project implementation, with environmental permitting cited as the most burdensome by over half of the respondents. Furthermore, 20 projects identified themselves as first-of-a-kind for the authorities granting the permits.

Construction and environmental permits were the most cited, with 32 projects indicating their need for them. Large-scale EII projects often involve the construction of new facilities or plants or the expansion of existing facilities, which require approval from the local or regional authorities. When these facilities rely on infrastructure located outside the project site –

such as external piping or the electrical grid infrastructure –, several authorities may be involved in the permit assessment, and their coordination can make the permitting more complex.

According to the survey, the **environmental impact authorisation** is the most commonly required permit in the EII cluster. At the workshop, project beneficiaries emphasised the critical importance of conducting comprehensive studies early in the permitting process to prevent or minimise prolonged authorisation times.

Although most issues related to environmental permits reported by the EII projects are in line with the general observations for the wider IF portfolio, this cluster highlights the challenges related to the declaration of **end-of-waste status**. Projects that recycle waste and residues into valuable products must obtain end-of-waste recognition for their main feedstock before they start operating. End-of-waste recognition is especially challenging for first-of-a-kind processes, primarily because of the absence or the inadequacy of relevant precedents. The uneven implementation of the end-of-waste classification across regions – even within the same country – further exacerbates the issue, creating a complex and inconsistent legal environment for these projects. Concretely, a quarter of the respondents to the survey required an end-of-waste certificate; these are projects that use biomass, solid municipal waste or captured CO_2 to produce fuels or chemicals as well as projects that recycle plastics, batteries or glass.

Operation and safety and land use and/or zoning permits were also very demanded, with 24 and 19 projects, respectively, in need of such permits. In particular, 14 projects submitted **grid connection permit** applications, primarily for innovations involving electrolysers or electrified technologies integrated into their processes. Projects in the EII cluster use renewable hydrogen to produce steel – through the direct reduction of iron – as well as ammonia, methanol and synthetic fuels; the hydrogen is generated on site via water electrolysis powered by renewable electricity. Moreover, a number of projects aim to electrify core production processes or key components improving energy efficiency. These include electrifying glass melting furnaces or implementing electric heat generation or recovery systems. For innovations focusing on hydrogen integration or process electrification, securing grid connection approval is critical to ensure a stable and sufficient supply of renewable electricity, which is essential for the operation of these technologies.

Four in ten EII projects reported that obtaining permits is dependent on **external factors**, with the vast majority considering it to have a high to very high impact on their projects. Most of the reported issues relate to grid connection or to electrical infrastructure that are needed for the operation of the projects but are not yet ready and/or approved.

Finally, almost half of the respondents (16) signalled that their project was **at risk of being delayed** because of difficulties with obtaining permits. When the delay materialised, impacting the project authorisation and final investment decision, projects had to postpone the financial close and, in some cases, extend the project duration.

The key highlights of the EII cluster are summarised in Table 3.

Table 3. Permitting highlights of EII projects

Key highlights

- The vast majority of EII projects required the approval of new permits.
- Environmental impact authorisation is the most frequently required permit in this cluster.
- End-of-waste certification is essential and often challenging for the projects that aim to valorise waste or residue.
- Projects focusing on process electrification or using hydrogen are highly dependent on grid connection permits.
- Four in ten projects were dependent on external factors, with a potentially high impact on the project implementation.
- Almost half of the projects signalled to be at risk of being delayed.

6.2. Industrial Carbon Management (ICM)

Within the survey sample, 16 projects belong to the ICM cluster, which encompasses carbon capture, transport, utilisation and storage; they are in almost all instances very large projects, with CAPEX of several hundreds of million euro, reflecting the capital-intensive nature of these projects. However, in two cases there are smaller projects which, instead of focusing on such large-scale technology deployment, aim to test at pilot scale an innovative solution for CCS.

The following points have emerged as particularly important for the ICM cluster.

The ICM projects generally require the construction and/or refitting of multiple large installations and infrastructure; this characteristic is generally positively correlated with a high permitting burden within the IF portfolio, and indeed ICM projects face **numerous permitting challenges**. No respondent stated that no work on permitting was needed, and only one project needed merely to update existing permits, as it is located within an operational facility; six needed new permits and the remaining nine needed both to update existing permits and pursue new ones. Interestingly, it is clear that in the ICM cluster the interaction between respondents and the authorities is particularly complex. In only one case the respondent stated that they interacted with a single authority (a dedicated governmental agency), and in two cases with two of the four administrative levels analysed in Section 3.2. In eight cases, projects had to interact with three of these administrative levels, and in five with all four. In terms of the degree of the potential challenge the ICM projects face, it is noteworthy to point out that 13 respondents out of 16 considered permitting among the top challenges, but only one ranked this as the top one. This reflects the deep preparatory studies which are necessary for such large-scale projects, before receiving the greenlight from the relevant authority. In addition, while 11 respondents anticipate delays in the project schedule due to permitting issues, none estimated that the delay would be significant enough to seriously put the project at risk.

One of the key issues that appeared from both the survey and the permitting workshop is that the **existing regulations and standards do not yet reflect the reality** of carbon capture and storage. For example, a project struggled with the unclear interplay between the Water Framework Directive and their CO_2 underground storage process; this issue was confirmed as important at the permitting workshop, where it emerged that clearer guidelines in this regard would greatly assist in assessing site suitability for carbon storage. In addition, two ICM projects cited as an obstacle the lack of dedicated CO_2 storage legislation which was being discussed but was not yet approved. Concerning carbon capture, a similar situation was reported by multiple projects with regard to the Revised Industrial and Livestock Rearing Emissions Directive (IED 2.0)

([19]). Under the existing IED 2.0 rules, based on the Best Available Technology determined values, emissions have to respect precise limits measured in terms of quantities per volume. When CO_2 is captured, emissions can appear higher due to lower gas volume even if the actual emissions in absolute quantity are not increased or even reduced. Two ICM projects reported that they have been able to tackle the issue, by proposing new formulas and providing additional data to the authorities, but at the price of substantial delays, numerous interactions and additional costs.

Similarly, projects reported difficulties obtaining permits for the **transport of CO_2**. This related most commonly to obtaining the national permits, when the necessary legislation was not in place or delayed with regard to transporting and storing CO_2; but in two cases projects also reported difficulties related to international CO_2 transport, as the 2009 amendment to the London Protocol ([20]) has been ratified but not yet fully implemented. 7 respondents commented positively about the commitment they experience, the support they received, and/or the openness to dialogue on part of the authorities, even if they reported issues with the existing, not yet fit-for-purpose regulatory framework. This indicates that in the case of the ICM cluster, while substantial policy efforts are needed, there is also widespread awareness of this need among policymakers and permitting authorities.

The majority of ICM projects singled out **environmental permits** as the most burdensome to obtain. In line with the results observed for the entire portfolio surveyed, the environmental impact assessment is often cited by ICM respondents as a complex and lengthy endeavour. However, multiple respondents in this cluster linked the difficulty in concluding the environmental permitting process to the point above, namely the unreadiness of the regulatory framework for this new sector. As specific rules have not yet been fully developed, projects struggle to fit under the existing rules on emissions, or to comply with the existing air or water protection rules.

An important aspect to underline in the case of the ICM cluster, which appears also in other clusters, is that the success of ICM projects is often dependent on **permitting procedures outside of the project's scope**. Namely, 13 respondents out of 16 stated that this was the case for them. Very significantly, they estimated that problems with completing the external permitting procedures in time can have a very high impact on their project: on a scale ranging from 1 (no impact) to 5 (very high impact), 8 projects estimated it to be at the highest level, 5, and four at 4. This clearly suggests that these projects are at risk of delay, or even of not being viable, due to these external factors. More specifically, these external permitting procedures regard the construction of infrastructure (pipelines and terminals in particular); the designation and operationalisation of storage sites (for the projects limiting their scope to the CO_2 capture and thus in need of an external storage site); or non-CO_2 specific issues such as the permitting of a power transmission line which is needed by the project. It is evident that the achievement of many ICM projects hinges on the context they operate in, and on the policies in place at regional, national and international level. The scale and infrastructural needs of these projects allow them to operate successfully only within favourable framework conditions; as succinctly put by a respondent, the CO_2 value chain is very complex and not only in the hands of the project promoter.

The key highlights of the ICM cluster are summarised in Table 4.

([19]) Revised Industrial and Livestock Rearing Emissions Directive (IED 2.0): https://environment.ec.europa. eu/topics/industrial-emissions-and-safety/industrial-and-livestock-rearing-emissions-directive-ied-20_en

([20]) The 2009 amendment to the London Protocol allows for the export of CO_2 for sub-seabed geological storage: London Protocol Climate Change Leaflet 2019 _FINAL_online version.pdf

Table 4. Permitting highlights of ICM projects

Key highlights

- All ICM projects surveyed required work on permitting, and in almost all cases in relation to new permits.
- Important challenges in the permitting process are related to the inadequacy of the current standards and regulations for carbon storage and utilisation or the complexity of the permits for the transport of CO_2.
- Environmental permits, and especially the environmental impact assessment, were considered the most burdensome by ICM projects.
- The large majority of projects are dependent on permits outside of their scope (such as for pipelines or carbon storage sites), which can have a great impact on their success.

6.3. Energy Storage (ES)

With 12 projects in the survey, the ES cluster contains two main types of projects. On the one hand, there are projects dealing directly with energy storage, i.e., providing energy storage solutions (including both electricity and heat). The typical project of this kind is small-scale, using energy storage for a specific purpose in a specific location. On the other hand, the cluster includes projects dealing with the manufacturing of energy storage equipment, such as batteries or their components; these projects tend to be much larger in scale and offer their products to a much broader and geographically distributed customer base. The permitting challenges are clearly different for the two types of projects; the projects offering energy storage solutions in a specific location mostly face challenges related to the specific nature of their technology and location, while the manufacturing projects typically encounter challenges that are common to large industrial projects dealing with complex supply chains.

The following points have emerged as particularly noteworthy for the ES cluster.

Overall, the projects belonging to this cluster are **less impacted by permitting issues compared to the other 4 clusters**. Three out of twelve do not report the need to work on permitting, as they operate within already existing installations or in an already fully permitted industrial park. Of the remaining nine projects, none considers permitting to be the top challenge they face, while 8 mention it among the top challenges. Significantly, while 5 projects considered that their timeline could be delayed due to permitting issues, none of them estimated that the delay would be longer than 12 months and most well below that threshold, suggesting that the delay is not sufficient to put the project at risk of not achieving FC within 4 years. This is in stark contrast with the overall sample, where about one quarter of respondents estimated that the potential delay was equal or superior to 12 months (see Section 0).

With regard to the **dependence on external permitting procedures**, 3 projects in the survey reported that they are strongly (in one case, "fully") dependent on, as defined in the survey, *activities/infrastructure outside the project scope that require permits (for example: construction and/or operational permits for vital infrastructure such as power transmission lines or pipelines*). More specifically their ability to proceed is completely dependent on the development of the necessary grid/network infrastructure.

For projects dealing with energy storage rather than manufacturing of components for energy storage, the **maturity of the regulatory framework** has appeared as an important factor. Some countries have well-developed frameworks that take into account the need to coordinate and integrate new actors into the grid, such as storage providers and prosumers; in such countries, projects benefited from faster and simpler permitting procedures, as well as from clearly defined contractual relationships. Contrarily, in Member States with less mature regulatory environments, IF projects reported difficulties in their ability to see their plans for energy storage services and solutions approved.

The key highlights of the ES cluster are summarised in Table 5.

Table 5. Permitting highlights of ES projects

Key highlights
▪ Energy storage permitting issues are primarily tied to energy grid connection limitations.
▪ No ES project reported being at risk of serious delay.
▪ Projects relying on grid infrastructure are strongly dependent on its development.
▪ A mature regulatory framework greatly assists ES projects with permitting and commercialisation.

6.4. Renewable Energy (RES)

Permitting is recognised as an important issue in EU policymaking in the field of energy. In particular, as permitting processes can be an obstacle to renewable energy projects, the revised Renewable Energy Directive (RED III)[21] includes provisions that simplify and speed-up permitting processes to help set renewable energy projects in motion, while at the same time giving due consideration to the concerns of citizens and respecting environmental standards. These measures are aimed at shortening and accelerating the permit-granting process for renewable energy projects, as well as for grid and infrastructure projects that are needed to integrate renewable energy into the electricity system. It is important to note that the IF projects participating in the permitting workshop advocated for a faster transposition and implementation of EU legislation in this regard. Project representatives pointed out that their competent permitting authorities were failing to adopt EU-standard processing times, often because of a lack of sufficient resources.

The RES cluster in the survey consists of 14 projects, including mostly projects producing renewable energy but also some which manufacture components to be used in RES technologies. In general terms, a significant majority of these projects (nearly two thirds) consider **permitting to be either the main challenge they face, or among the top challenges**. The remaining projects, which are predominantly renewable energy manufacturing projects, often do not face severe permitting issues as they operate often within existing facilities. In other cases, such as the setting up pilot installations which operate within testing facilities, projects do not need to follow the complex permitting procedures of fully operational installations. Thus, within the RES cluster, permitting is a more serious issue for the deployment of RES installations on the ground, than for the manufacturing of RES components projects. Furthermore, for pilot installations, the availability of a dedicated testing site can simplify the permitting aspects of the project and thus be a key enabler.

Based on the permitting survey results as well as the feedback collected in the workshops, the following points have been identified as particularly important and distinctive for IF RES projects.

The projects that, while proposing an innovative solution, fit well within the existing permitting framework reported similar challenges as the overall IF portfolio. For example, a number of them stressed that the limited capacity within the permitting authorities was delaying the process. Generally, such projects did not report permitting as the main challenge they faced.

The situation is very different for the IF projects that propose a **radically new solution**, that **profoundly changes an existing technology**, or that **combines different technologies in an unprecedented manner**. All such projects reported that permitting was among the main challenge they faced, and in two cases that it was the main one, substantial enough to put the project at risk or to require a modification of the project intended scope. The permitting issues that projects reported were different in nature but always related to the highly innovative profile of the technology. In some cases, projects had to fit within the procedures created for an already established renewable energy technology; this caused delays and required additional efforts, as the framework did not encompass requirements flexible enough to accommodate a different solution. In addition, a project stressed how they found themselves at the end of the permitting queue. Namely, policymakers

([21]) Directive (EU) 2023/2413 - revised Renewable Energy Directive: https://eur-lex.europa.eu/eli/dir/2023/2413/oj/eng

in their Member State gave priority to permitting larger projects employing established technologies, in order to reach its ambitious RES goals. This approach can put innovative technologies whose potential is further into the future at a comparative disadvantage. In other cases, projects reported that specific permitting procedures still needed to be created, or that the legislation was still evolving, so that the timeline originally foreseen had to be extended substantially. Finally, the coupling of renewable energy production with other technologies has proven to be challenging; for example, while procedures exist for offshore energy production as well as for the production of green hydrogen, combining them in the same installation did not fit well in the regulatory process. This translated into substantial difficulties in obtaining permits for the projects aiming at such combined solutions.

Lastly, the importance of **grid access** emerged in the qualitative feedback and was confirmed in the permitting workshop. The uncertainty of securing grid access can be a serious hindrance for new projects, particularly when the grid application can only be submitted at the final stage of the overall permitting process. A project that reported difficulties in this regard mentioned a positive development after being designated a pilot project important for the energy transition by the competent authorities. This designation allowed it to benefit from a more streamlined permitting process for a grid connection; while this solution can undoubtedly benefit specific projects, it is clear that a thorough grid planning performed in accordance with the expected RES generation targets is essential to allow the timely deployment of renewable energy installations at systemic level. This observation was discussed and validated at the permitting workshop.

It is noteworthy that only two RES projects reported that they could make use of a **one-stop shop or single point of contact**, an option which would clearly be beneficial as the high number of public authorities involved in the permitting procedures and the identification of all the relevant permits needed for the project to operate are seen as major challenges by numerous projects. It is thus clear that the RED III call on Member States to create a single unified application process for the entire administrative permit application and granting process for renewable energy projects is at the same time well targeted and ambitious, as the IF RES projects reported that, far from facing a single application process, they do not yet have a single point of contact available.

The key highlights of the RES cluster are summarised in Table 6.

Table 6. Permitting highlights of RES projects

Key highlights
▪ RES deployment projects struggle more with permitting than RES manufacturing projects. ▪ Permitting is particularly difficult for projects proposing radical innovations or combining different technologies in an unprecedented manner. ▪ Securing grid access can be a serious issue for new projects. ▪ The availability of a one-stop shop or single point of contact, recommended in the RED III, is still limited.

6.5. Hydrogen

Supporting the renewable hydrogen economy is a key priority of the European Union within energy and climate policymaking ([22]). In this context, the Fund plays an important role, financing hydrogen and hydrogen-related projects both in its main calls as well as with dedicated instruments such as the hydrogen auctions ([23]) or dedicated topics ([24]) within the main calls. This is reflected in the growing number of projects dealing with hydrogen in the IF portfolio. The Hydrogen cluster brings together projects centred on producing renewable and low-carbon hydrogen, as well as initiatives aimed at establishing manufacturing capacities for equipment used in hydrogen production plants. It should be noted that the majority of the current IF projects on hydrogen were signed after the cut-off date for the survey and are thus not included in the present analysis.

13 projects participating in the survey belong to the Hydrogen cluster, as their main activity relates to hydrogen. However, a number of projects belonging to the EII cluster have an important hydrogen component, as they produce and/or use it as feedstock, reductant or energy carrier, and they have been discussed in Section 0.

The following points have emerged as being particularly important for the hydrogen cluster.

Similarly to the ICM cluster, Hydrogen projects can be strongly impacted by **permitting procedures outside of their project scope.** Within the 13 projects in this cluster, 6 stated that they are reliant on such external permitting procedures; this share is per se in line with the average across the respondents, but a closer analysis reveals that the 7 projects that are not impacted are mostly dealing with small-scale hydrogen production and use (often in transport). The large projects dealing with industrial-scale hydrogen production and utilisation are instead mostly dependent on external permitting procedures, and very significantly, 80% of the projects that confirmed this dependency rated its potential impact on the project as high or very high. Specifically, potentially impactful permitting issues relate to the construction of new power lines for the supply of electricity to the hydrogen production unit, the construction of a dedicated hydrogen pipeline to deliver hydrogen to its users (within the hydrogen strategy of the country/region where the project is located) and, in one case, the supply of water to be used in producing electrolytic hydrogen. In addition, projects that participated in the IF workshops stated that permitting issues in the development of renewable energy infrastructures (particularly in the case of wind energy) posed a clear risk, as they could adversely impact the projects' ability to secure Power Purchase Agreements (PPAs), which in turn impacts the project schedule and possibly their viability.

Another important issue identified in both the survey and the workshops relates to the **novelty of the technology**. This challenge is particularly pronounced in regions and/or and Member States with no prior experience of hydrogen production, where hydrogen projects must operate within a regulatory framework not designed for their specific characteristics. In one such a case, a project reported that existing regulations require clarification, particularly regarding the practical rules for implementing hydrogen projects. However, this situation also appears in some Member States with multiple hydrogen projects (IF- or national-funded). A respondent from one of these Member States noted that there is no specific permitting process for hydrogen production and that they relied on parts of other regulations while consulting with local, regional and national authorities.

Notably, both in the permitting survey and workshop, projects revealed that strong political endorsement at the national level for hydrogen does not necessarily lead to an easier implementation on the ground. More specifically, it did not translate into concrete actions and support for the local authorities responsible for issuing the permits, who had to deal with a new type of project. It is thus clear that efforts are needed to both clarify the rules and support and educate the authorities responsible to implement them. However, it is encouraging that, during the permitting workshop, a project from a Member

([22]) Hydrogen as a key component in the EU's strategy to the energy transition, net-zero, and sustainable development.: https://energy.ec.europa.eu/topics/eus-energy-system/hydrogen_en

([23]) See: Auctions - European Climate, Infrastructure and Environment Executive Agency

([24]) See, for example, the INNOVFUND-2022-LSC-03-MANUFACTURING topic within the INNOVFUND-2022-LSC call: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/innovfund/wp-call/2022/call-fiche_innovfund-2022-lsc_en.pdf

State with a growing hydrogen portfolio noted the increasing awareness of hydrogen production technologies among authorities, which is helping to facilitate the permitting process. A layer of complexity related to the technology is added when considering not only the production of hydrogen but its utilisation too. One project reported that permitting for established technologies was straightforward, but **combining multiple technologies** (e.g., hydrogen production with its utilisation as feedstock) created complexity and delays. A possible solution for such situations could be to integrate and/or coordinate the permitting procedures when the different steps of production happen on the same site, to avoid redundancies and the difficulties related to having multiple procedures each with its own risks and timeline.

Lastly, one of the most significant challenges reported by the Hydrogen projects, which however is not directly related to permitting, is linked with the **transposition of the Renewable Energy Directive** (RED III) into national law. Projects reported that, as the RED III targets shape demand and market incentives for renewable hydrogen, a speedy transposition would help also dealing with permitting by making it necessary, for policymakers and regulatory authorities, to support them as vital contributors to the RED III targets for renewable fuels of non-biological origin (RFNBO).

The key highlights of the Hydrogen cluster are summarised in Table 7.

Table 7. Permitting highlights of Hydrogen projects

Key highlights
▪ Large projects producing or using hydrogen are highly dependent on permitting procedures outside of the project scope (e.g., grids, renewable energy projects, pipelines). ▪ The novelty of the technology results in issues for both producing and utilising hydrogen. ▪ Projects report that a quick transposition of the Renewable Energy Directive would benefit their activities.

6.6. Manufacturing across clusters

Within the survey, 11 projects manufacture products or components for renewable energy production, energy storage or hydrogen production. It is important to note that only the projects placing their output on the market are considered here manufacturing projects; those producing equipment (for example, a battery or a windmill) for their own use are not. Following the approach of the *2025 Annual Knowledge Sharing Report of the Innovation Fund*, these projects have been attributed in the analysis above to the cluster their products or components falls under. For example, projects manufacturing components for batteries have been attributed to the ES cluster. However, it is also interesting to analyse them together as a group independently of the cluster they belong to; the manufacturing activity they have in common might lead to specific characteristics and challenges.

The following points have emerged as particularly important for the manufacturing projects:

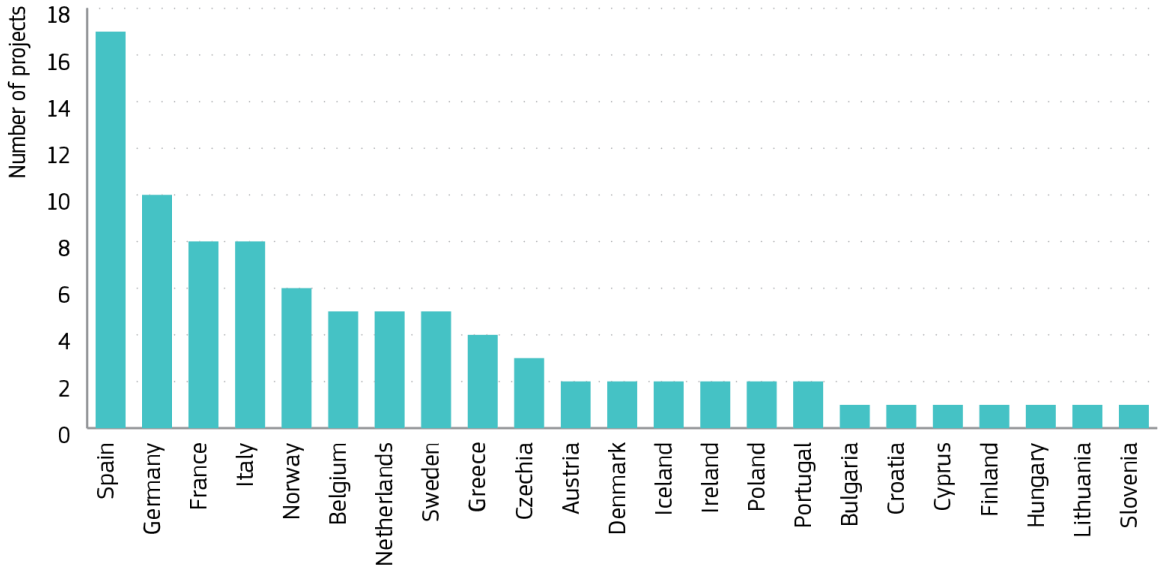
In general, **permitting poses less of a challenge for manufacturing projects** than for other sectors. Four out of the eleven projects in the survey sample did not require new permits nor to update existing ones, a share that is far higher to the one in ten observed for the whole sample of projects; manufacturing projects often operate within existing, fully permitted facilities. Very significantly, only one project considered itself to be at risk of delay due to permitting issues, and to a limited extent, with a potential delay of 5 to 8 months. Three of the projects declared that they were dependent on external permitting procedures; these related to access to electricity, namely to the construction of new power lines and/or of transformation stations. However, no project rated this dependency at the highest level of potential impact; the respondents were generally confident that the power infrastructure would become available in time, or with a limited potential delay, for their operations.

The main reason behind this less challenging situation with regard to permitting for manufacturing projects is to be found in the **different innovative profile** they present. In most IF projects, the innovation occurs within the installation subject to permitting; typically, a project develops a new raw material-processing plant, or an innovative renewable energy installation. This can lead to many of the permitting difficulties described in this report. In the case of manufacturing projects, the innovation occurs mostly within the manufactured product, in terms of its design, its materials and/or its performance; in addition, the manufacturing usually happens within designated industrial areas. This means that in most cases, the existing framework for the permitting of production facilities can be applied with less complexity to the project. This is proven by the fact that only two out of the eleven manufacturing projects considered themselves to be first of a kind for the permitting authorities. Significantly, in both these cases the respondents evaluated the institutional capacity of competent authorities in evaluating the project as very high; authorities were clearly able to apply, without serious issues, the existing rules to the innovative solutions proposed by the applicants. An important caveat is that none of the IF manufacturing projects reached entry into operation yet; therefore, the permits they had to deal with mostly had to do with the pre-production activities. Manufacturing projects will generally need additional permits to place their products on the market, in order to comply with product regulations and with industrial standards. While no specific challenge regarding this aspect has been identified yet, it cannot be excluded that some will emerge as projects progress towards entry into operation and production.

7. THE GEOGRAPHICAL DIMENSION

The size of the sample in the survey (90 projects) did not allow to conduct a sufficiently robust analysis of permitting experiences across the EEA countries represented in the IF portfolio. Although the sample size was appropriate for meaningful collection and analysis of aggregated results, it was too small to allow a thorough examination of permitting aspects within specific countries, among them, or across the numerous European regions and municipalities. At the time of the survey, most countries had only a limited number of projects, as shown in Figure 29. As the IF portfolio is steadily growing, such analysis is likely to become possible in the future.

Figure 29. Distribution of surveyed projects per main country of implementation



However, a significant preliminary conclusion can already be drawn. The survey results, as well as the information gathered in the workshop, indicate that **local and regional dimensions are important** and may have greater influence than the national dimension. This aspect goes beyond the simple fact that, as detailed in Section 3.2, local and regional authorities are commonly responsible for granting the permits, and also that the support institutions, such as one-stop shops or single points of contact, are mostly established at the regional level. In fact, it emerges from the survey as well as the workshops that the experience and challenges IF projects experience is **not strongly correlated with the country** they are located in: projects active in different locations of the same country often report very different experiences. This conclusion about the importance of the regional and local dimensions with regard to permitting is strongly supported by a number of specific experiences; three significant ones are reported below:

- Among the numerous projects located in two strongly decentralised Member States, Germany and Spain, many reported very different experiences **depending on the region or federal state** ([25]) they were based in. Very significantly, often the project coordinators were active in more than one region and reported that in their experience the permitting procedures and difficulties could vary substantially across regions. In addition, some projects also underlined how having completed permitting following the procedures of a region did not necessarily make it easier in other regions of the same Member State, as regions follow different procedures and, at times, do not recognise

([25]) Some Member States define the administrative level between the central state and the local administration as a region, other as a state, as in Spain and Germany respectively; following EU practice, the term "region" or "regional" includes both denominations in this context.

the authorisation given by another region and require repeating the procedure. This conclusion is based on the survey feedback as well as specific discussions at the permitting workshops, where it was particularly supported by projects targeting waste valorisation.

- As presented in Section 3.2, over 80% of IF projects need to interact with the local authorities, the government level most commonly responsible for the permits needed. An interesting point emerged from some projects active in less federated Member States, i.e., where the regional dimension is less important. These projects reported that the **local dimension** was vital for them, and that practices vary substantially within the same country. In the words of one respondent, "In our Member State, permitting timelines varied drastically between municipalities - ranging from weeks to months - due to inconsistent local administrative practices"; these words are echoed by the statement of another project located in a different country, according to which "From one city to another there are huge differences. In one city the process takes weeks, in the other it takes months".
- **An interesting example emerged from two EII projects** which are active in the same sector, employ a similar technological solution and are located in the same EU Member State; despite these similarities, they reported very different permitting experiences. One of them struggled with obtaining the necessary permits and complying with the procedures within the expected timeframe, to the point of considering itself at risk. The other, while having to invest substantial resources in permitting as inevitable for their complex endeavour, did not list it as the main challenge and proceeded speedily towards financial close and then the preparation for entry into operation. The main reason for the divergent experiences of these two projects is to be found in the different conditions at the local level. In one case, the project was actively supported by the local administration and appreciated by the local community, thanks in particular to its potential to create jobs in an area undergoing a substantial economic shift. In addition, the responsible local authority was experienced in dealing with large installations, which also helped the permitting process. In the other case, such support was lacking, both in terms of a strong backing from the local authorities and in being perceived as a positive opportunity by the local population.

The qualitative feedback collected in the survey and the workshops, although based on specific cases, confirms the importance of regional and local dimensions, as observed in the quantitative analysis in Section 3.2. Regional and local authorities are often the competent permitting authorities; their capacity and ability to assess the permits application is vital for the deployment of low-carbon technologies.

8. LESSONS LEARNED

As detailed above, permitting challenges are often underestimated in terms of complexity, effort and time. When faced with unexpected issues, or with more serious difficulties than those anticipated, projects **reacted in several ways**:

- The most common way projects responded to permitting challenges (23 cases) was by devoting more effort to their **interactions with the authorities**. This was not limited to making interactions more frequent. Projects also put effort in giving more structure to their interactions with the authorities, for instance by scheduling regular meetings and organising coordination meetings involving all the relevant institutions. In addition, they proactively provided information in advance to anticipate possible concerns on the part of the authorities, and revised accordingly their applications before submission, thus reducing the need for subsequent iterations.
- Often, projects **increased the workforce** dealing with permitting; in 10 cases they devoted additional and/or more experienced employees to the permitting activities, while in 14 cases they hired external specialists. Interestingly, in the latter case the specialist consultants were technical experts in the relevant fields, along with legal and specialised permitting experts.
- Less frequently, projects revised their permitting approach (for example, by choosing a different regulatory framework than the one originally foreseen, in the case of a project combining different technologies) or engaged with similar innovative projects to share information and best practices.
- In some cases, where the problem was the difficulty of proving their technology's worth to the authorities, projects invested in the collection of additional data and measurements. This solution was found to be effective, but also costly.

In the survey, projects were also encouraged to provide **suggestions** to improve the permitting procedures, and to identify the good practices they encountered. These are the main ones that emerged:

- A key suggestion, supported by numerous projects (14), is to **increase the capacity** of the permitting authorities by providing them with more resources in terms of personnel, expertise or both. A recurrent situation emerging from the survey is that while the national legislation sets an appropriate timeline for granting permits, the experience on the ground can be that "authorities [...] do not have sufficient resources to meet the required timelines for permitting". This suggestion correlates well with the importance of regional and local authorities described in the previous section, and it indicates that prioritising the increase of their capacity would be most beneficial.
- Several projects (13), while calling for shortening the time to permit in general terms, also provided ideas about how to do so. Key suggestions consisted, for example, in agreeing with the authorities to a structured **permitting time plan** at the beginning of the process, and in situations where the legislation allows it, in specifying a **maximum time** after which the request has to be considered as granted (this approach is already applied in multiples Member States with regard to some construction and refurbishment activities).
- A substantial number of projects (11) advocated a **special regime** for projects which are either pilot projects or key projects for decarbonisation. This regime would be different in the two cases; for very innovative and pre-commercial projects, it could consist of a regulatory sandbox (see Section 3.2) or a similar special permitting regime, where the innovation could be tested without having to follow the rules established for mature and commercial technologies. For projects which can prove to be strategic in terms of decarbonisation or other EU policy priorities, a priority system could be introduced. Importantly, this suggestion chimes well with the positive experience reported by five IF projects, which benefited from being recognised as strategic. This recognition translated into concrete benefits, such as receiving priority status and/or administrative support to obtain the necessary permits.
- A substantial number of projects (13) suggested **simplifying the interaction with the authorities** in a number of ways:

- Most commonly advocated was **better coordination** among the relevant institutions. This could be done via the introduction of a one-stop shop or a single point of contact, in the cases where this is not yet available; or by enhancing the institutional coordination, for instance by appointing a focal office or a project permitting manager. For example, a project suggested to "support the applicant during the various phases of all the licensing procedures (environmental, industrial, energy, construction, etc.), with the appointment of a single manager of the project permitting procedure by the public administration. Given the innovative nature of this kind of projects, this would guarantee coordination between the various permitting entities, and other intervening entities, as well as providing any information and clarifications requested". This approach would allow projects to interact with the different authorities in a more structured manner.
- In addition, the introduction of **more flexibility** (e.g., allowing limited design changes without requiring the restart of the procedures; or starting procedures with some details to be provided later) was also recommended in five cases.
- Three projects suggested to allow, whenever possible, **parallel permitting procedures** rather than requiring sequential ones, in order to reduce the overall time required. This approach would be particularly beneficial for complex projects which integrate different solutions and thus need to acquire a high number of permits; if they can be acquired only sequentially, the time required is not only substantial but also subject to a potential cascading impact of each delay. The potential benefits of the approach have been recognised by EU policymakers; for example, Commission Recommendation (EU) 2024/1343 states that "simultaneous applications should be prioritised over sequential applications if different authorisations are required".
- Finally, it has been shown in Section 3.2 that the digitalisation of the procedures is well advanced: full digital submission is already available to over 60 % of projects, while about half of them report that a fully digital interface is made available by the permitting authority for the entire process. A common recommendation is to **further digitalise** the procedures. Clearly this can be done by making digital submission available where currently it is not, but projects also suggest increasing digitalisation further, for instance by digitalising all correspondence, eliminating paper copies and more generally pushing for a fully digitalised process.

Table 8 outlines the main challenges identified in the report and the solutions projects suggested to overcome them.

Table 8. Summary of the main challenges and the solutions identified

Main challenges	Potential solutions
▪ Scale of the effort in terms of time, complexity and resources needed. ▪ Interdependency of different permitting procedures. ▪ Dependency on external permits. ▪ Framework designed for existing technologies. ▪ Lack of harmonised standards and common interpretation of rules.	▪ Increase the capacity of authorities and coordination among them. ▪ Simplify interaction with authorities. ▪ Agree on a time plan at the start of the procedure and/or maximum time to grant. ▪ Increase flexibility and digitalisation. ▪ Special regime for pilot/strategic projects for decarbonisation.

9. CONCLUSIONS

The results of the survey and the feedback collected in the workshops show that permitting is a major issue in the deployment of innovative low-carbon solutions in terms of the scale, complexity and magnitude of the effort that projects need to make to obtain the necessary permits to operate. The main takeaway messages are:

- Permitting procedures require **very substantial resources** from most IF projects participating in the survey, with an average of seven permits needed per respondent. Two thirds of them consider it a top challenge and 1 in 10 consider it the main challenge.
- Complexity in obtaining permits is often increased by the **interdependency** of different permitting procedures within a project, but also by the frequent **dependency on permits outside of the projects scope** (e.g., for infrastructure such as pipelines or power lines).
- **Environmental permits** are both the most frequently needed and the most frequently cited as the most burdensome and/or time-consuming.
- Projects deploying **first-of-a-kind solutions** face additional hurdles, as their technologies often do not fit well into the existing framework.
- **Increased capacity** of the authorities, more **flexibility** and greater **digitalisation**, **innovation-friendly revisions** of the permitting procedures as well as of EU and national legislation, along with a **special permitting regime** for pilot or strategic projects are identified by the respondents as potential solutions.

The feedback from projects suggests that the attention given to streamlining permitting for decarbonisation projects by policymakers is well justified, and that relevant policy efforts at EU level are well-targeted. Relatively new initiatives such as the streamlining of permitting for strategic projects under the NZIA, the flexible approach to permitting of new technologies of the IED 2.0 or the multiple workstreams under the RED III are too recent to impact on the survey results but appear well in tune with the needs that emerged in the survey. Future analysis should be undertaken to quantify the impact of these measures. The results of this report will support streamlining efforts, by feeding into the upcoming Industrial Decarbonisation Accelerator Act, which under the Clean Industrial Deal will 'propose concrete measures to address permitting bottlenecks related to industrial access to energy and industrial decarbonisation'.

ANNEX I – THE PERMITTING SURVEY

The Innovation Fund Permitting Survey 2024, developed by CINEA and DG CLIMA with contributions from DG GROW and DG ENER, was published on EUSurvey at https://ec.europa.eu/eusurvey/runner/InnovationFund_Permitting_Survey and concluded in November 2024. Out of the 121 IF project beneficiaries who received the survey, 90 submitted a reply; those which did not generally declined as they had not collected yet enough relevant experience to share. The information from the replies of the survey was treated, and its analysis is presented in this report; it should be noted that the limited information collected for some questions did not allow for an in-depth treatment and are only briefly discussed in this report.

The survey started with this introductory text:

"This questionnaire is designed to collect structured information from all Innovation Fund projects on permitting. It is meant to provide an in-depth assessment of permitting challenges and mitigation measures implemented by projects, by gathering individual responses on, among others, the time needed for obtaining different types of permits, the complexity of applying, obtaining and implementing permits for different areas of activity, with a strong focus on the challenges that are brought by the innovativeness of the Innovation Fund projects.

According to the latest Innovation Fund Knowledge Sharing Report, permitting was found to be one of the main factors for delay in reaching financial close or other important project milestones. With the recently enacted Net Zero Industry Act, selected net-zero technology manufacturing projects, as well as carbon capture and storage projects, will benefit from enhanced permitting procedures and more predictable timelines for the permitting processes. While the Net Zero Industry Act is already in force since late June this year, the Commission still needs to issue implementing and delegated acts, that will also touch the streamlined permitting aspects. First-hand information from net zero projects in the deployment stage will be crucial to inform the Commission in the process.

The Innovation Fund is one of the world's largest funding programmes for the demonstration of innovative low-carbon technologies. Most of the projects funded will be able to benefit from the provisions of the Net Zero Industry Act. This questionnaire will be used as a basis for the Knowledge Sharing tool in view of providing regularly the Commission with first-hand information on how permitting processes can be improved or on how projects can be better supported to achieve their milestones.

In this light, we invite you to respond to the below questions.

Please note that the inputs to this survey will remain confidential. Only anonymised and aggregated information will be shared with the public."

After identifying themselves, each project respondent replied to a series of questions across five main areas:

I. Permits required for starting operation
II. Engagement with authorities
III. Permit application process
IV. Activities related to permitting process
V. General questions

In all areas except the last one, questions were mostly either multiple-choice or allowed to give a fast reply by ranking the option in descending order of importance, or by stating a level of intensity (for example, by estimating the severity of an impact on the project from 1 to 5). However, in all cases where it was needed the option to give textual replies to describe specific situations and issues was available; for example, by having a box text available when selecting "other" in a multiple-choice question.

In the last area 'V. General questions', the following questions were asked, most of them being open ones; this more extensive feedback, which was more detailed but less aggregable, forms the basis of the qualitative analysis of this report, together with the feedback collected at the IF knowledge sharing workshops.

1. Overall, what do you see as major challenges related to the permitting procedures of your project (multiple choices are possible)?
2. Please highlight any important additional information about permitting which is not captured by the questionnaire.
3. Have you seen any recent improvement in the planning or permit-granting process for the sector of your project at national level?
4. What improvements or changes do you think would streamline the permitting process?
5. Please describe the measures you put in place (or plan) to tackle the challenges encountered in relation to the permitting process.
6. In case the challenges you encountered stem from an incomplete regulatory framework, please provide details on lacking regulations and on the expected amendments/completions, if this is the case.
7. On the contrary, if you had a positive experience during any segment of the permitting procedures, please share with us good practices that you might have encountered.

ANNEX II – THE PERMITTING WORKSHOP

On 7 May 2025, an Innovation Fund knowledge sharing workshop on Permitting was held in Brussels.

The event attracted over 250 participants, with 76 attending in person and 175 joining online. The workshop included 77 projects financed by the Fund, Connecting Europe Facility and Horizon Europe, along with representatives from all the Member States and Norway, the European Environment Agency (EEA) and several services of the European Commission (the Directorates-General for Climate Action, Energy, Environment and Internal Market Industry Entrepreneurship and SMEs, the Joint Research Centre, and CINEA).

The programme was structured into three distinct segments:

1. Introduction and context: The morning session commenced with a presentation of the key findings of the permitting survey, alongside policy updates from three prominent Directorates-General of the European Commission: DG Environment (ENV), DG Internal Market, Industry, Entrepreneurship and SMEs (GROW), and DG Energy (ENER).
2. Project experiences and insights: The second segment showcased the experiences of eight projects that have navigated the permitting process, offering valuable lessons learned and best practices.
3. In-depth discussion and collaboration: The final segment consisted of a closed-door roundtable discussion, where project groups engaged in a facilitated conversation to address specific questions and challenges, fostering a collaborative exchange of ideas and expertise.

The key takeaways of the workshop are available here: workshop summary.

The slides of the presentations shown here are available here: slides. They include a presentation summarising the results and main takeaways of the permitting survey.

ABBREVIATIONS

CAPEX	capital expenditure
CCS	Carbon Capture and Storage
CCU	Carbon Capture and Utilisation
CINEA	European Climate, Infrastructure and Environment Executive Agency
CO_2	carbon dioxide
DG CLIMA	Directorate-General for Climate Action
DG ENER	Directorate-General for Energy
DG GROW	Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
EIIs	energy-intensive industries
EIO	entry into operation
EU ETS	EU Emissions Trading System
ICM	industrial carbon management
IED 2.0	Revised Industrial and Livestock Rearing Emissions Directive
IF	Innovation Fund
FC	financial close
GHG	greenhouse gas
GW	gigawatt
LSC	large-scale call
NZIA	Net-Zero Industry Act
PPA	Power Purchase Agreement
RED III	revised Renewable Energy Directive
RES	renewable energy
RFNBO	renewable fuels of non-biological origin
SSC	small-scale call

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