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TOWARDS A STREAMLINED DIGITAL PERMITTING PROCESS: A SWEDISH CASE STUDY

Nischal Bhattarai, Annika Moscati , Ulf Seigerroth , Alexandros Tzanetos , Erik Bergström
Jönköping University, Jönköping, Sweden

Abstract

Environmental permitting is a key instrument for enabling sustainable development, but it is often characterized by long processing times, administrative burdens, and uncertainty about outcomes. Although prior research and government inquiries highlight weaknesses in the Swedish permitting process, empirical evidence on how these challenges manifest themselves in practice remains limited. This study investigates the permitting process by triangulating a scoping review, government reports, and an exploratory case study. The findings identify challenges that constrain information flow, coordination, and decision-making, underscoring the need for a digitally enabled process architecture to support a more coordinated, streamlined permitting process.

Introduction

Environmental permitting ensures that infrastructure developments comply with environmental standards. European initiatives, such as the European Green Deal and REPowerEU, emphasize accelerating sustainable projects to achieve decarbonization by 2050 (European Commission, 2019). Achieving these objectives requires accelerating the deployment of clean energy while ensuring environmental protection and addressing regulatory constraints (IEA, 2023).

Sweden is recognized for demonstrating high ambition in environmental policy and climate governance, supported by advanced regulatory structures and strong eco-innovation performance (OECD, 2025). However, challenges remain in translating these ambitions into effective implementation across environmental domains and in coordinating the environmental permitting process (European Commission, 2022). Increasing pressure to accelerate permitting for electrification and infrastructure central to the green transition also exposes the limitations related to regulatory complexity and the lengthy approval process (Phan et al., 2025; Clean Energy for EU Islands Secretariat, 2023).

Although the permitting process aims to balance environmental protection and industrial growth, it remains complex and time-consuming, increasing procedural burdens and uncertainty (Marin et al., 2024). The processes involve multiple interdependent stages, stakeholder interactions, and decision points, affecting coordination within the permitting process (Fauth et al., 2025). In the Swedish environmental permitting process, key stages, such as examining environmental impact assessments, assessing the completeness of the application, consultation, supplementation, and written exchanges, are handled through sequential administrative routines that increase manual coordination and iterative exchanges (Miljötillståndsutredningen, 2024a; Swedish Environmental Protection Agency, 2025). Furthermore, handling and disclosing personal and sensitive data during stakeholder coordination and collaboration also requires a higher level of protection and poses challenges to facilitate such exchanges (Malmaeus et al., 2021).

Digital technologies have been proposed to improve environmental assessments, including GIS-based decision support systems, data-driven analytics, and platforms for real-time information sharing and monitoring (Fothergill and Murphy, 2021). While the implementation of such digital technologies in environmental governance could facilitate green transformation (Zhao et al., 2025), their effectiveness depends on how they are designed, implemented, and integrated into existing institutional and governance contexts (Kloppenburg et al., 2022).

In Sweden, the government inquiry report (SOU 2024:98) highlighted the need for a more coordinated and streamlined digital permitting process, noting that current systems are fragmented, lack coordination, and are insufficient to ensure transparency and predictability (Miljötillståndsutredningen, 2024a). The growing demand for procedural efficiency positions the Swedish permitting system as a valuable case for analyzing both structural challenges and potential reform pathways. Thus, the paper aims to contribute to the understanding of the underlying problems and challenges as a prerequisite to the conceptual design of a streamlined digital permitting process through triangulation of international scientific literature, a case study, and a Swedish government inquiry report addressing the following research question:

RQ: What are the challenges related to the Swedish permitting process that hinder the development of a streamlined digital permitting process?

Background

The Environmental Permitting Process in Sweden is governed by the Swedish Environmental Code, its associated ordinances, along with complementary administrative

and legal regulations (Miljötillståndsutredningen, 2024b). The Environmental Code provides a framework for environmental protection, including requirements for environmental assessments and permits for activities that may have environmental impacts (Cinthio, 2019). Such activities, defined as environmentally hazardous activities due to emissions, discharges, or other disturbances, are subject to a permit or notification obligation.

The environmental permitting process begins with an early investigation and screening consultation with the County Administration Board to determine whether the activity has a significant impact or not (SEI). If SEI is expected, a full environmental impact assessment (EIA) is required; otherwise, a simplified EIA is prepared (Malmaeus et al., 2021). In the next step, the application is formally submitted, together with the EIA and supporting documents, to the competent authority: Land and Environmental Court (activity type "A"), County Administrative Board (activity type "B"), and Municipality (activity type "C") (Swedish Environmental Protection Agency, 2025). After the application is received by the competent authority, it reviews the application completeness, publishes it for public comments, and exchanges. Once the comments are received from stakeholders, the operator addresses them through clarification and, if necessary, supplementation. Finally, the authority decides on the application after receiving clarifications from the operator (Cinthio, 2019). The operator may appeal the decision of the competent authority to higher instances, depending on the authority involved. The highlighted process is a brief overview; however, the actual process often involves sub-activities within each step, multiple supplementation rounds, iterations, and exchanges.

Digitization has been considered a strategic priority for improving decision-making in public governance in Sweden (Regeringskansliet, 2025). Studies have emphasized the role of digital systems in enabling coordination among stakeholders and supporting decision-making (Axelsson et al., 2025; Larsson, 2023). Although digital infrastructure for environmental data and biodiversity monitoring exists in Sweden, these systems are implemented across various authorities, leading to fragmented responsibilities and coordination challenges. The absence of a centralized data platform and the diversity of data formats and standards across systems reduce interoperability and limit the integration of digital systems into unified workflows (Biodiversa+, 2024). Consequently, while digitization in Sweden is relatively mature in terms of data infrastructure and information availability, it remains less developed in supporting integrated, end-to-end process architectures required to coordinate complex regulatory procedures, such as environmental permitting.

Research Method

This study triangulates the scientific literature, an exploratory case study, and SOU 2024:98 to investigate challenges in the permitting process in practice. A scoping review was used to gather information on the normative permitting process in Sweden, while an exploratory case study investigated how complex interactions influence the permitting process in a real project context, where normative process descriptions alone may not fully capture real-world complexity.

Scoping literature review

The PRISMA method for scoping literature reviews was applied (Tricco et al., 2018). The scientific literature was systematically selected and reviewed to analyze the state of the art in environmental permitting and identify the complexity of the process. To obtain a broad overview, relevant literature was searched in Scopus, Web of Science, and Google Scholar. An initial generic search was conducted to identify key terms. The keywords *Permitting process, Environmental impact assessment (EIA), Environmental regulations, Regulatory frameworks, Governance and policies, and Sector/context*, along with their synonyms, were combined using various Boolean operators to achieve the widest possible coverage of relevant studies published between 2020 and 2025. A total of 559 records were identified, exported in .ris format, and imported into the web-based software Rayyan for further screening. Automatic duplicate detection was run, and consequently, 212 records were removed. The remaining 318 articles were screened based on title and abstract, of which 27 were deemed relevant. Following the full-text assessment, 12 articles were selected for a detailed analysis, as illustrated in Table 1. The findings from the selected articles were extracted and organized in a structured format. The data were then categorized into thematic codes following an open coding approach to identify the recurring themes that support the analysis of the study (Strauss and Corbin, 2015).

Table 1: Summary of literature search and screening process

Stage	Records
Initial database search (Scopus, Google Scholar, and Web of Science)	**559**
Duplicates removed	212
Records after duplicates removed	**318**
Title and abstract screening excluded	291
Marked as "possibly relevant" (title/abstract)	27
Full-text studies included in thematic synthesis	**12**

Grey literature review analysis

Understanding of the Swedish permitting process was developed through grey literature, which enabled analysis of official reports, permitting process guidelines, and government inquiries (SOU 2024:98). Some of the grey literature was originally written in Swedish and was accurately translated using Microsoft Word's built-in translation features. The selection of such literature followed the CRAAP test, which evaluated these selections based on five criteria: Currency, Relevance, Authority, Accuracy, and Purpose (Meriam Library, 2010). The inquiry report (SOU 2024:98, part 2) was analyzed as secondary data using a document analysis approach to examine challenges in the Swedish permitting process. The themes thus identified in the investigation report were categorized into codes and reported in this study.

Case Study and focus group

A case study design was adopted to investigate the Swedish permitting process in a real-world context, where such factors are critical for identifying persistent challenges. The study provides analytical generalization by examining a project that followed the full permitting trajectory, including the application and judicial review (Yin, 2018). Thus, this case study provides empirical evidence of the underlying challenges that hinder the digitization of the permitting process. The case serves as the primary data source and is thematically analyzed to identify barriers to process efficiency and digitization. However, analysis is limited to the permitting phase and excludes post-permitting stages.
The case study analyzes the permitting process of one of the established industrial and infrastructure development companies in the Nordic region. The company is involved in the handling of aggregates and quarrying operations, which are classified as environmentally hazardous activities under Swedish Environmental legislation. Depending on the environmental impact and the scale of the project, such activities undergo a permitting process and are subject to environmental permit requirements. Thus, the case company is highly relevant, as it directly interacts with Swedish environmental regulatory frameworks and the permitting process, and serves as the basis for selection.
Furthermore, a focus group discussion was conducted using a purposive sampling of participants directly involved in the permitting process, including administrative practitioners, EIA specialists, an engineer, and a project manager (Creswell, 2009; Patton, 2015). The strategy followed a key informant approach, given their relevance and expertise in the process, and a homogeneous sampling approach due to their participation in the common permitting process (Patton, 2015). The discussion was guided and anchored by a simplified process model developed in accordance with the Swedish Environmental Protection Agency, and practitioners were allowed to express their opinions and reflect on the permitting process. Subsequently, notes were taken and categorized into the themes related to the permitting process in practice. The notes were verified through the member-checking approach and thus served as a tool for contextualizing the case study and interpreting the findings. Even though the purposeful sampling approach can introduce selection bias, several strategies, such as data triangulation, member checking, diverse participants, and focused discussion, helped ensure its credibility and reliability (Creswell, 2009).

Case Study

The case study analyzes a permitting process for the extension of an existing quarry operation, including rock blasting, sorting, asphalt production, landfill operations, and water activities, under the Swedish Environmental Code. The operation, active since 2007, required a new permit application in 2021 as the existing one was set to expire in 2022. Due to the scale and nature of the project, it was classified as Activity type "A" and examined by the District Land and Environment Court (Mark- och miljödomstolen, MMD). It was assessed to have a significant environmental impact, requiring consultation and submission of a full EIA.

During the review, the authorities requested that the application be supplemented and clarified regarding water management and landfill design, and the application was made public by the authority upon completion. Stakeholders raised several concerns about groundwater impacts, blasting noise, and trust in the evaluation of the process. The court proceeded after receiving clarification of the stakeholders' concerns and granted a permit with multiple operating and monitoring conditions.

The applicant appealed parts of the judgment (8, 9, and D3) to the Land and Environmental Court of Appeal (Mark- och miljööverdomstolen, MÖD), requesting clarification and amendments to specific permit provisions: Conditions 8, 9, and D3. The appeal focused on the ambiguous formulations of requirements related to sampling and classification, the restriction on the use of inert waste within the landfill without clarification, and the absence of explicit delegation that allows the supervisory authority to adapt inspection methods. The applicant did not challenge the environmental assessment of the reviewing authority, but argued that rigid and ambiguous conditions could create legal uncertainty. The court reviewed the appeal and, in 2023, amended these provisions while keeping the rest unchanged and legally binding.

The process involved document-based exchanges, including the submission of an application, raising stakeholders' concerns via a contact form, and the examination and interpretation of textual descriptions, permit conditions, and compliance criteria by both the applicant and the reviewing authority. The case study analysis presents an empirical investigation of the permitting process in practice and offers insights into the challenges identified in the literature, serving as a prerequisite for designing an efficient, streamlined, and coordinated digital permitting process.

Discussion and result analysis

Based on the literature review, the case study, and SOU 2024:98, several challenges in the Swedish permitting process are identified and summarized in Table 2. Each of these challenges identified in the study indicates underlying requirements for the conceptual design of a streamlined digital system to enable a transparent, coordinated, and efficient permitting process. The following sections present the challenges observed, the underlying requirements that these challenges produce, and analytical solutions that could potentially address such issues in the permitting process: *Regulatory Ambiguity and Interpretive Inconsistency, Institutional and governance constraints, Procedural sequencing failure, Stakeholder participation and legitimacy Issues, Confidentiality and Competition, Data Fragmentation and Usage Limitation.* The following subsections present the challenges observed in the Swedish permitting process.

Regulatory Ambiguity and Interpretive Inconsistency

One of the challenges identified in this study is the regulatory ambiguity and interpretive inconsistency in the permitting process. The case study demonstrates how ambiguous and unclear permit conditions triggered appeals due to difficulties in interpreting requirements.

Studies show that flexible, loosely harmonized regulatory criteria can lead to diverse interpretations and ambiguous decisions across regulatory authorities, prolonging the permitting process due to uncertainty (Wilson and Allard, 2023; Söderholm et al., 2022). A study by Wretling et al. (2022) highlights that spatial wind power plans in Sweden are applied and interpreted inconsistently across municipalities, leading to variation in their use as a decision-support tool.

Similarly, the SOU inquiry reports that the reviewing authorities are often perceived as not providing a clear position on requirements, such as what supplementary information is needed when assessing the completeness of the application. It highlights that the variation persists in permitting assessment across different authorities, leading to differences in requirements across regulating bodies, and illustrates the interpretative inconsistency of regulatory authorities (Miljötillståndsutredningen, 2024a).

This challenge of diverse regulatory interpretations indicates the need to represent legal requirements, provisions, and permit conditions in a clearer, standardized, and traceable manner. A potential solution could be to translate such regulatory requirements and provisions into machine-readable representations, such as ”rule as code”. This approach may not completely eliminate ambiguity; however, it can make underlying assumptions, thresholds, and relationships between regulatory provisions explicit, transparent, and traceable (Huggins et al., 2024). In addition, a decision support repository for storing prior applications, permit conditions, interpretations, and decision standards could complement it by linking rule representations with case-based evidence through structured metadata. This enables systematic comparison and alignment of interpretations across cases and regulatory bodies, therefore, improving consistency and predictability in the permitting process (Boess et al., 2021).

Institutional and governance constraints

Institutional and governance constraints are also identified as permitting challenges. Environmental assessments often require intergovernmental coordination due to overlapping jurisdictions, resulting in a fragmented, uncoordinated process (Wilson and Allard, 2023). In Sweden, the decentralized, multi-authority structure lacks horizontal coherence, while limited administrative capacity and expertise reduce efficiency (Streit et al., 2025). The increasing regulatory requirements for a broader scope of assessments, project characteristics, and institutional capacity make the permitting process time-consuming and pose a systemic challenge (Johnson et al., 2023; Söderholm et al., 2022).

Similarly, the SOU inquiry highlights unclear investigation requirements and reliance on referral authorities, and the absence of a clear threshold for application completeness. Limited guidance, staff turnover, and resource constraints at the regional and local level further affect consistency and timeliness, while increasing regulatory demands linked to the green transition intensify this pressure (Miljötillståndsutredningen, 2024a).

The case study also highlights decentralized institutional responsibilities and fragmentation in the current permitting process. The reviewing authority’s request for opinions from other regulatory bodies, such as the Building and Environment Administration, the County administration board, and the Geological Survey of Sweden, during application assessment indicates how the reviewing authority’s decisions could be influenced by such referral authorities.

The findings suggest the need for a coordinated, transparent system with common infrastructure, interoperable information exchanges, and clear role designations across authorities. A potential solution could be the design of a coordinated, centralized permitting platform that integrates data, actors, and procedural steps into a unified process architecture. This reduces fragmentation and improves information flow between stakeholders (Miljötillståndsutredningen, 2024a).

Procedural sequencing failure

Unclear procedural sequences and insufficient cross-referencing between regulations create additional challenges in the permitting process. The effectiveness of stakeholder participation is influenced by the sequencing and timing of procedural steps, as unresolved issues deferred to later stages can amplify risks and conflicts (Samec Berghaus et al., 2025; Fauth et al., 2025; Bernauer et al., 2023). Similarly, unclear scope definitions during consultation and redundant information flows across multiple authorities contribute to inefficiencies and delays (Freeman et al., 2022).

Table 2: Summary of the identified challenges in the permitting process and potential analytical solutions

Challenges Identified	SOU 2024:98	Case study/focus group	Literatures	Analytical Solution
Regulatory Ambiguity and Interpretive Inconsistency	X	X	X	Rule-as-code representations, decision-support repository and structured metadata to improve consistency, traceability, and predictability
Institutional and governance constraints	X	X	X	Coordinated centralized permitting platform with common infrastructure, interoperable information exchange, clear role designation across authorities
Procedural sequencing failure	X		X	Workflow orchestration model, rule-based validation, early application-completeness checks, clearly defined stages and information requirements
Stakeholder participation and legitimacy Issues	X	X	X	Digital stakeholder participation with access to project information, traceable feedback and monitoring, transparent review process
Data Fragmentation and Usage Limitation	X	X	X	Interoperable data infrastructure, harmonized metadata, API-based integration
Confidentiality and Competition	X	X		Data-sharing governance model, access control for sensitive information, selective sharing of commercially non-sensitive data

The SOU inquiry also highlights that procedural sequencing and timing, such as assessing completeness of the application and handling of supplementation, are recurring challenges in the Swedish permitting process. It notes the absence of a clear starting point of the deadline that the authority can confirm for the completeness of the application, and when statutory processing times begin. Workflow sequencing varies across authorities: some complete substantial work before formal processing begins, while others proceed only after formal public announcements. Thus, insufficient coordination and sequencing of procedural activities are also identified as contributing to delays in the permitting process (Miljötillståndsutredningen, 2024a).

The identified challenge, as presented above, points to the need for systems with a clear process flow, controlled sequencing of data and activities, and an early validation mechanism to ensure application completeness. A solution to the identified challenge could be implementing a workflow orchestration model in combination with a rule-based validation mechanism. This may reduce the need for iterative supplementation by structuring the process into clearly defined stages and information requirements.

Stakeholder participation and legitimacy Issues

Stakeholder participation and legitimacy are also identified as key challenges affecting the permitting process. While stakeholders play a critical role in shaping permitting outcomes, ineffective participation can undermine the EIA process and increase distrust (Bernauer et al., 2023). Although participation of affected groups, including indigenous communities, has improved, meaningful engagement remains constrained by resource limitations and procedural designs that marginalize concerns (Bernauer et al., 2023; Johnson et al., 2023). Delayed or insufficient early consultation, along with an unclear division of responsibilities, further contribute to conflicts during the review phase (Fauth et al., 2025). Wretling et al. (2022) argues that infrastructure development cannot realistically be achieved without harming the environment, so influencing the local opposition through a narrative of creating local jobs may not be sufficient

The inquiry indicates that the role of authorities in the Swedish permitting process is often perceived as unclear and unpredictable. Supervision and self-monitoring are perceived as person-dependent, raising concerns about consistency and competence. Inconsistent assessments of

similar activities across counties further reflect unclear roles and definitions, sometimes prompting applicants to adjust permit pathways to avoid uncertainty. This lack of procedural clarity leads to repeated supplementation and can prolong the permitting process. The inquiry notes that in some cases, authorities act simultaneously as advisors and supervisors, creating ambiguous roles that influence applicants' strategic choices regarding permit pathways (Miljötillståndsutredningen, 2024a).

The case study also illustrates that local stakeholders lack trust in the process, as they highlighted insufficient consultation and transparency requirements during the written exchange phase of the permitting process. Consequently, the demand for increased monitoring and for addressing perceived risks posed by activities in the vicinity was evident.

The issue of stakeholder participation and legitimacy indicates that transparent, traceable feedback and monitoring, and an inclusive participation mechanism are needed. A solution to address this challenge could be to enable digital stakeholder participation by providing access to project information, facilitating stakeholder engagement, tracking submitted concerns, and ensuring a transparent review process (Boess et al., 2021). Participation is most effective when it combines representation, communication, and delegation of power, and the mechanism ensures meaningful and traceable stakeholder influence in the decision-making process (Newig et al., 2023; Fothergill and Murphy, 2021).

Confidentiality and Competition

Confidentiality and competition are also identified as challenges that could lengthen permitting timelines. Although transparency is required, access to relevant data is constrained by legal considerations, institutional practices, and differences in digital information sharing across stakeholders (Miljötillståndsutredningen, 2024a). This limits the effectiveness of using the data and makes managing it more difficult.

The focus group also revealed that the information disclosure in the permitting process depends upon the sensitivity of the projects. For instance, projects that require handling and use of explosives, a rock quality assessment, and detailed exploration plans may be considered commercially confidential and therefore not shared publicly. This creates conflict between the transparency and the protection of commercial interests. It was emphasized that while early investigations allow applicants to assess and identify strategically viable locations, the public nature of the permitting process increases the risk of exposing competitive information.

It highlights the need for a secure data-sharing mechanism with controlled access to sensitive information, while balancing transparency and confidentiality. A solution to mitigate this issue could be implementing a governance model for data sharing and access control within the permitting process, thereby balancing transparency and competition. In addition, evidence from practice highlights the importance of structured metadata, interoperability standards, and the selective sharing of commercially non-sensitive data to enhance transparency while avoiding disclosure of sensitive information (Boess et al., 2021).

Data Fragmentation and Usage Limitation

Studies suggest that limited data accessibility and use also pose challenges for permitting, especially when evidence-based assessment depends on extensive environmental monitoring data (Streit et al., 2025). For example, in water discharge permitting, a lack of appropriate tools, monitoring technology, and structured emission can hinder evidence-based decision-making (Jensen et al., 2020). The presence of datasets from prior projects could help address stakeholders' recurring concerns and improve consultation efficiency (Freeman et al., 2022). Studies have indicated that the lack of accessible data for environmental permitting investigations can add a burden on applicants to conduct additional studies, which, otherwise, could help address recurring stakeholder concerns and enable evidence-based decision-making (Jensen et al., 2020; Streit et al., 2025; Freeman et al., 2022).

The inquiry report notes that, although County Administrative Boards and the Swedish Environmental Protection Agency initiated the collaboration to publish metadata for environmental assessment cases in digital form, the service may not have covered all relevant aspects and does not meet EU requirements. It emphasizes that the availability of data for measurement and monitoring enables reuse across different cases and can also facilitate automation (Miljötillståndsutredningen, 2024a).

The discussion from the focus group also highlights the challenges posed by the lack of accessibility of detailed data in the permitting process and indicates that, even though initial screening is performed using available information, the existing data lacks sufficient detail for assessment, requiring further studies. Furthermore, it notes that regions vary in digital adoption maturity, and the challenges lie in moving beyond the digital formats.

This challenge indicates that the data are fragmented and distributed across authorities, requiring improved integration, standardization, and interoperability. Due to the institutional independence of regulatory agencies in Sweden, the collection of such data into a centralized system might be difficult; therefore, enabling interoperability and integration between data infrastructures such as the Swedish Biodiversity Data Infrastructure, Species Observation Systems, agencies using shared, harmonized metadata, and application programming interface could be a potential solution (Biodiversa+, 2024).

Conclusions

This study investigated the challenges in the Swedish permitting process through a scoping review of available literature and conducted an exploratory case study. The findings reveal that the existing permitting challenges do not stem primarily from a single factor but rather from several

factors associated with the permitting process, distributed across different stages. Furthermore, it highlights that the permitting process extends beyond a regulatory procedure and involves complex socio-technical aspects, heavily influenced by interactions among legal requirements, stakeholders, procedural complexities, and dependencies. These challenges are not merely procedural but reflect underlying socio-technical constraints related to information flow, coordination, and decision-making across distributed actors. As such, they indicate the need for digitally enabled process architectures that can support structured workflows, interoperable data exchange, and transparent decision-making within the permitting system. Therefore, digitization efforts must go beyond standalone solutions and focus on integrated systems that could facilitate an improved, transparent, and efficient process.

This study also acknowledges several limitations. The analysis is based on a single case study and adds analytically to the understanding of issues within the permitting process; however, it limits generalization to the broader population. Moreover, though the approval process includes application, decision, and appeal, excluding the post-permitting stage limits the study's ability to capture challenges that may arise during implementation and monitoring. In addition, selecting focus group participants through a purposive sampling approach within a single organization may still introduce bias and limit the diversity of perspectives. Lastly, the study identifies digitization requirements at the conceptual level but does not provide empirical testing of the specific technologies to address these challenges. Future research will examine the conditions and requirements for conceptualizing and implementing the digital environmental permitting platform.

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References

Axelsson, J., Stureborg, E., Dochtorowicz, B., Kaaman, M., and Ahlner, E. (2025). Implementation and structure of a contact point for net-zero regulatory sandboxes – implementation-phase proposals. Vinnova - Sweden's Innovation Agency.

Bernauer, W., Hostetler, G., Greene, E., Tester, F., Harris, R., and Tanguay, L. (2023). Undermining assessment: Eia follow-up, stake-holder advisory groups, and extractive industries in nunavut, canada. Impact Assessment and Project Appraisal, 41(2):87 – 101.

Biodiversa+ (2024). Sweden national report biodiversa+ governance sub-pilot. Technical report, European Biodiversity Partnership.

Boess, R., Lyhne, E. ., and Kørnøv, I. . (2021). Digitalisation in Environmental Assessment: International frontrunners. The Danish Center for Environmental Assessment (DCEA), Aalborg University.

Cinthio, K. (2019). Assessment of environmentally hazardous activities. Technical report, County Administrative Board, Skåne.

Clean Energy for EU Islands Secretariat (2023). Clean energy for eu islands regulatory barriers in sweden: findings and recommendations. Technical report, European Commission Directorate-General for Energy.

Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches. Sage Publications, Thousand Oaks, CA, 3rd edition.

European Commission (2019). The european green deal. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en. Accessed: 16 January 2026.

European Commission (2022). Environmental implementation review 2022: Country report – sweden. Technical report, European Commission.

Fauth, J., Gade, P. N., Kaiser, S., Raj, K., Pedersen, J. G., Olsson, P. O., Nisbet, N., Ventura, S. M., Hirvensalo, A., Granja, J., Urban, H., Rutešić, S., Verstraeten, R., Raitviir, C. R., Kallinen, A. R., Schranz, C., Stojanov, T., and Tekavec, J. (2025). Investigating building permit processes across europe: characteristics and patterns. Building Research and Information, 53:417–434.

Fothergill, J. and Murphy, J. (2021). The state of digital impact assessment practice. Technical report, International Association for Impact Assessment.

Freeman, M. C., O'Neil, R., Garavelli, L., Hellin, D., and Klure, J. (2022). Case study on the novel permitting and authorization of pacwave south, a us grid-connected wave energy test facility: Development, challenges, and insights. Energy Policy, 168.

Huggins, A., Witt, A., and Burdon, M. (2024). Digital distortions and interpretive choices: A cartographic perspective on encoding regulation. Computer Law & Security Review, 52.

IEA (2023). Net zero roadmap: A global pathway to keep the 1.5 °c goal in reach - 2023 update. Technical report, International Energy Agency.

[1] https://www.smartbuilt.se/in-english/projects/value-chains-and-business-models/smarte/

[2] https://www.smartbuilt.se/

Jensen, D. M. R., Thomsen, A. T. H., Larsen, T., Egemose, S., and Mikkelsen, P. S. (2020). From eu directives to local stormwater discharge permits: A study of regulatory uncertainty and practice gaps in denmark. Sustainability, 12(16).

Johnson, E. L., Ericsson, M., and Löf, A. (2023). The mining permitting process in selected developed economies. Land Use Policy, 131.

Kloppenburg, S., Gupta, A., Kruk, S. R., Makris, S., Bergsvik, R., Korenhof, P., Solman, H., and Toonen, H. M. (2022). Scrutinizing environmental governance in a digital age: New ways of seeing, participating, and intervening. One Earth, 5:232–241.

Larsson, A. (2023). Climate transition in cities – a swedish governance model to accelerate the rate of transition. Technical report.

Malmaeus, M., André, H., Hellsten, S., Lindblom, E., Åsa Romson, and Rydstedt, A. (2021). Miljömålen i miljöbedömning och tillståndsprövning utmaningar och möjligheter [environmental objectives in environmental assessment and permit review challenges and opportunities]. Technical report, Naturvårdsverket.

Marin, D., Pravuljac, M., Tralmaka, I., and Martins, M. (2024). Understanding strategic projects under the crma: A guide to rights and processes. Technical report, ClientEarth.

Meriam Library (2010). Evaluating information – applying the craap test. California State University, Chico.

Miljötillståndsutredningen (2024a). En ny samordnad miljöbedömnings- och tillståndsprövningsprocess, sou 2024:98, del 2 [a new coordinated environmental assessment and permit review process, sou 2024:98, part 2]. Technical report, Regeringskansliet.

Miljötillståndsutredningen (2024b). En ny samordnadmiljöbedömnings- och tillståndsprövningsprocess, sou 2024:98, del 1 [a new coordinated environmental assessment and permit review process, sou 2024:98, part 1]. Technical report, Regeringskansliet.

Newig, J., Jager, N. W., Challies, E., and Kochskämper, E. (2023). Does stakeholder participation improve environmental governance? evidence from a meta-analysis of 305 case studies. Global Environmental Change, 82.

OECD (2025). Oecd environmental performance reviews: Sweden 2025. Technical report, OECD Publishing.

Patton, M. Q. (2015). Qualitative research & evaluation methods: Integrating theory and practice. SAGE Publications, Thousand Oaks, CA, 4th edition.

Phan, N. A., Hellsmark, H., Göransson, L., and Johnsson, F. (2025). Electrifying tensions: Stakeholder narratives to electrification of industry and transport in sweden. Energy Research and Social Science, 126.

Regeringskansliet (2025). Sveriges digitaliseringsstrategi 2025–2030 [sweden's digitization strategy 2025–2030]. Technical report, Regeringskansliet Finansdepartementet.

Samec Berghaus, N., Ferčič, A., and Drnovšek, K. (2025). Slovenia's nuclear energy pathway: Strategic expansion, regulatory hurdles, and future prospects. Journal of Agricultural and Environmental Law, 20(38):123 – 155.

Strauss, A. and Corbin, J. (2015). Basics of Qualitative Research. SAGE Publications, Inc., 4 edition.

Streit, S., Passarella, M., and Tost, M. (2025). The influence of environmental policies on mineral permitting in europe: Challenges and insights from spain and sweden. Extractive Industries and Society, 24.

Swedish Environmental Protection Agency (2025). Så går en tillståndsprövning enligt miljöbalken till [this is how a permit review under the environmental code works].

Söderholm, P., Bergquist, A.-K., Pettersson, M., and Söderholm, K. (2022). The political economy of industrial pollution control: environmental regulation in swedish industry for five decades. Journal of Environmental Planning and Management, 65(6):1056–1087.

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M. D., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garritty, C., Lewin, S., Godfrey, G., Macdonald, M. T., Langlois, E. V., Soares-Weiser, K., Moriarty, J., Clifford, T., Tunçalp, and Straus, S. E. (2018). Prisma extension for scoping reviews (prisma-scr): Checklist and explanation. Annals of Internal Medicine, 169(7):467–473.

Wilson, G. N. and Allard, C. (2023). Institutional determinants of mining projects in canada and sweden: Insights from the prosperity and kallak cases. Environmental Management, 72(1):53 – 69.

Wretling, V., Balfors, B., and Mörtberg, U. (2022). Balancing wind power deployment and sustainability objectives in swedish planning and permitting. Energy, Sustainability and Society, 12.

Yin, R. K. (2018). Case Study Research and Applications: Design and Methods. SAGE Publications, Thousand Oaks, California, 6th edition.

Zhao, X., Zhang, S., and Lu, F. (2025). The impact of digital environmental governance on green transformation: Theoretical mechanism and empirical test from china. Sustainability, 17.