JOURNAL OF ENERGY TECHNOLOGY
Vol. 18, No. 4, pp. 251–260, December 2025

ENVIRONMENTAL ASSESSMENT: SAFEGUARDING NATURE AND ACCELERATING THE GREEN TRANSITION

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Professional Article

Submitted
1. 12. 2025

Accepted
23. 12. 2025

Published
31. 12. 2025

Abstract The accelerated deployment of a renewable energy infrastructure is a cornerstone of the European green transition, yet the planning, assessment and permitting processes are perceived increasingly as bottlenecks. This paper examines environmental assessment as an enabling framework that can support faster, more coherent and more legitimate decision-making in the context of energy system transformation. Rather than framing environmental assessment as a procedural barrier, the paper conceptualises it as a decision-making and governance infrastructure that integrates environmental, social and health considerations into energy planning. Drawing on recent research and a synthesis of contemporary practice, the paper highlights the importance of early engagement, systems thinking and transformative approaches that move beyond narrow compliance-oriented assessment. Particular attention is given to the balance between acceleration and simplification, as well as to the role of agency, collaboration and professional capacity. The paper concludes that a well-designed environmental assessment does not slow down the green transition, but helps ensure that it is resilient, legitimate and aligned with the long-term sustainability objectives.

Keywords
environmental assessment, green energy transition, Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA), sustainable development goals, systems thinking, energy planning and governance

https://doi.org/10.18690/jet.18.4.251-260.2025

1 Introduction

The accelerated deployment of renewable energy technologies has become a defining feature of the European green transition. Wind farms, solar power plants, power-to-X facilities, carbon capture and storage, grid reinforcements and large-scale infrastructure projects are being developed at an unprecedented pace in response to climate targets and energy security concerns. While technological solutions and investment readiness have advanced rapidly, the institutional capacity has struggled to keep up. The planning, assessment and permitting processes are identified increasingly as critical bottlenecks – not necessarily due to their existence, but due to their ability to balance speed, sustainability and societal legitimacy [1].

Within this debate, environmental assessment is often framed as a procedural constraint that slows down project implementation. Such a perception, however, risks overlooking the core function and potential of an environmental assessment. When applied with purpose and at the right stage, an environmental assessment can operate as an enabling governance mechanism that helps translate technological readiness into responsible and legitimate action. Rather than acting as a brake on development, it can function as a bridge between urgency and responsibility – supporting decisions that are not only fast, but also fair and sustainable [1].

This perspective aligns with the recent environmental assessment scholarship, which emphasizes increasingly the need to move beyond narrow compliance-oriented practices towards more decision-oriented and transformative approaches.

The environmental assessment encompasses a broader family of impact assessment instruments, including the Environmental Impact Assessment (EIA) at the project level and Strategic Environmental Assessment (SEA) at the level of plans and programs. Embedded in the European Directives, the ESPOO Convention and its SEA Protocol, these instruments form a cornerstone of environmental governance across Europe and globally. Their scope is deliberately broad, extending beyond biophysical impacts to include the population, human health, land use, material assets and cumulative effects. This requires systems thinking – an ability to recognize interconnections, trade-offs and synergies between climate mitigation, biodiversity protection, resource use and social well-being. A narrow focus on carbon reduction

alone risks shifting environmental and social burdens elsewhere, thereby undermining the long-term resilience of the transition [1] [2] [3].

Recent research has highlighted the importance of rethinking both the role and the timing of environmental assessment. Early engagement, particularly through effective scoping, is critical for shaping alternatives, avoiding technological and spatial lock-ins and reducing conflicts later in the project lifecycle. Studies have demonstrated that integrating broader sustainability objectives – such as those articulated through the United Nations Sustainable Development Goals - can strengthen the relevance and completeness of environmental assessments, especially with regard to human health and social dimensions [2] [4].

At the same time, current policy debates emphasize the need for accelerated permitting and regulatory simplification to meet the 2030 and 2050 targets. While simplification can improve efficiency and quality when applied thoughtfully, it can also weaken environmental protection, public participation and trust if pursued in a narrow or reductive manner.

Against this background, this paper examines environmental assessment as an enabling framework for the sustainable green energy transition. The paper explores how environmental assessment can support faster, more coherent and more legitimate decision-making without compromising its safeguarding role. Rather than presenting new empirical findings, the contribution offers a conceptual and integrative perspective aimed at energy planners, engineers, policymakers and practitioners operating at the intersection of technology, governance and sustainability.

2 Environmental Assessment in the Green Energy Transition

Environmental assessment is situated at the intersection between energy system transformation and environmental governance. In the European context, nearly all key elements of the green energy transition – renewable energy installations, grid expansion, power-to-X facilities, carbon capture and storage, as well as large-scale spatial planning initiatives - fall within the scope of the Environmental Impact Assessment (EIA) or Strategic Environmental Assessment (SEA) [1].

As such, environmental assessment represents a critical interface where technological ambitions meet regulatory frameworks, societal values and ecological limits. Rather than functioning solely as a protective mechanism, environmental assessment plays a broader role in risk management, optimization and legitimacy-building. By identifying environmental and social risks early, shaping alternatives and informing decision-making processes, the assessment can support projects in navigating complex real-world conditions. This role is particularly relevant in the context of rapid renewable energy deployment, where conflicts over land use, biodiversity, local communities and cumulative impacts are increasingly common. Environmental assessment offers a structured arena in which these competing interests can be addressed transparently and systematically, thereby reducing the likelihood of downstream opposition and project delays.

3 Environmental Assessment as a Decision-Making and Systems Framework

At its core, an environmental assessment is not an end in itself, but a means to support informed decision-making. Its purpose is to ensure that choices, whether at the level of policy, planning or project development, are made with knowledge rather than in ignorance. This requires a systems perspective that recognizes the interconnected nature of the environmental, social and economic dimensions of sustainability.

A narrow focus on climate mitigation alone risks creating unintended consequences. Large renewable energy projects may deliver significant carbon reductions while simultaneously degrading biodiversity, altering landscapes, or displacing local communities. The research emphasizes that sustainability cannot be reduced to a single objective, instead, it involves navigating trade-offs across multiple boundary conditions [3].

An environmental assessment provides an institutionalized space where these trade-offs can be examined, negotiated, and, where possible, transformed into synergies. The integration of human health and broader social considerations strengthens the relevance of environmental assessment further. Expanding the scope of EIA and SEA beyond the traditional biophysical parameters enables a more comprehensive understanding of project impacts and aligns assessment practice with the wider

sustainability objectives [2]. In this sense, environmental assessment functions as a systems-based decision framework rather than a technical checklist.

4 From Mitigation to Enhancement: Rethinking the Role of Environmental Assessment

Environmental assessment has traditionally been structured around the mitigation hierarchy, prioritizing impact prevention, followed by minimization, restoration and compensation. While this hierarchy remains a fundamental principle, recent research has highlighted the limitations of a purely compliance-oriented application. Increasingly, assessment practice is evolving towards more proactive and transformative approaches, that seek not only to reduce harm, but also to generate positive environmental and social outcomes.

The concept of "beyond compliance" reflects a shift towards enhancement and transformative mitigation strategies, particularly in the context of biodiversity and spatial planning [3]. Within this perspective, development projects are no longer viewed solely as sources of impact, but also as opportunities to contribute to ecological restoration, social cohesion and long-term resilience. Environmental assessment can play a key role in enabling such outcomes, by reframing how alternatives are developed and evaluated, and by encouraging innovation within the project design.

5 Acceleration and Simplification: Maintaining Fitness for Purpose

The urgency of the green transition has placed increasing pressure on regulatory systems to accelerate the permitting and approval processes. Across Europe, reforms aimed at shortening timelines, improving digitalization and streamlining administrative procedures are being introduced, to support faster deployment of a renewable energy infrastructure [1]. While such measures can enhance efficiency, simplification remains a contested concept. Simplification can take multiple forms, including regulatory changes, administrative streamlining and improvements in assessment practice through better data, methods and digital tools. When applied wisely, these measures can improve both the speed and quality of environmental assessment. However, oversimplification carries significant risks. Reducing the scope of assessment too narrowly may weaken the environmental protection, limit

public participation and erode trust, ultimately increasing the likelihood of legal challenges and social resistance.

Research on EIA scoping demonstrates that early-stage decisions about what issues are considered, and which are excluded, have far-reaching implications for project outcomes and societal acceptance [4].

Maintaining fitness for purpose therefore requires a careful balance between acceleration and integrity, ensuring that simplification enhances, rather than undermines, the sustainability objectives.

6 Agency, Actors and Collaboration in Environmental Assessment

The environmental assessment processes are shaped not only by formal procedures and instruments, but also by the actions and interactions of multiple actors. Authorities, developers, consultants, researchers, non-governmental organizations and local communities all play distinct roles in shaping the assessment outcomes. As such, the environmental assessment is both a technical and a democratic process, dependent on collaboration, transparency and trust.

The recent scholarship emphasizes that meaningful change requires collective agency. Tools, regulations and methodologies only become effective when the actors possess the competence, confidence and willingness to use them constructively. Capacity building, professional networks and shared guidance frameworks can strengthen this collective agency by aligning the expectations and practices across the sectors [3].

In the context of the green energy transition, such collaboration is essential for ensuring that environmental assessment remains a facilitating agent rather than a procedural obstacle.

7 Discussion: Environmental Assessment as an Enabling Infrastructure

The analysis presented in this paper supports a reframing of environmental assessment from a procedural requirement towards an enabling infrastructure for the green energy transition. Rather than constituting an external constraint imposed

on energy projects, environmental assessment operates at the core of the decision-making processes where technological ambitions, environmental limits and societal values intersect. When applied early, coherently and with a systems perspective, an environmental assessment can reduce uncertainty, improve project design and enhance legitimacy, thereby contributing to a more robust and timely implementation of the energy infrastructure. A central insight emerging from both practice and recent research is that many delays attributed to environmental assessment are not caused by the assessment itself, but by its late or fragmented application. Reactive assessments, introduced after key strategic decisions have already been made, tend to trigger conflict, legal challenges and public opposition. In contrast, early-stage engagement through strategic environmental assessment and well-designed scoping processes can help steer development away from environmentally and socially sensitive areas, reducing the downstream risks and increasing the predictability for developers and authorities alike [4].

The discussion on acceleration and simplification highlights further that speed and sustainability are not inherently incompatible. Simplification measures can improve efficiency and quality when they focus on better coordination, improved data availability, digital tools and enhanced professional competence. However, simplification that prioritizes speed at the expense of participation, transparency or environmental protection risks undermining the very objectives of the green transition. Such approaches may lead to short-term gains, but often result in long-term setbacks through loss of trust, increased litigation and weakened social acceptance.

Environmental assessment also plays a critical role in addressing the multi-dimensional nature of sustainability. By integrating biodiversity, human health and social considerations alongside climate objectives, the assessment processes help avoid narrow optimization strategies that shift burdens across the environmental or societal boundaries. Recent research has demonstrated that incorporating broader sustainability frameworks, such as the Sustainable Development Goals, strengthens the relevance of the environmental assessment and enhances its capacity to support transformative change [2] [3].

In this sense, environmental assessment functions as a mediating space, where trade-offs are made explicit and more balanced decisions can emerge.

Finally, the effectiveness of an environmental assessment depends fundamentally on the agency. Instruments, methodologies and regulations do not operate in isolation, they are enacted by people. Collective agency - expressed through collaboration between authorities, developers, experts and communities - is essential for translating the assessment frameworks into meaningful outcomes. Capacity building, shared standards and professional leadership can strengthen this collective agency, ensuring that the environmental assessment evolves in step with the demands of the green energy transition.

8 Conclusions and Implications for Energy Planning and Policy

This paper has examined environmental assessment as an enabling framework for the sustainable green energy transition. Drawing on recent research and a synthesis of contemporary practice, it has shown that environmental assessment is not inherently a barrier to rapid deployment of renewable energy and related infrastructure. On the contrary, when applied strategically and with purpose, an environmental assessment can support faster, more coherent and more legitimate decision-making.

Three core conclusions can be drawn. First, timing matters. An early-stage environmental assessment, particularly at the strategic and scoping levels, is decisive for shaping viable alternatives, avoiding lock-in effects and reducing conflict. Second, sustainability requires a systems perspective. Addressing climate objectives in isolation risks undermining biodiversity, human health and social cohesion. The environmental assessment provides an institutionalized mechanism for navigating these interdependencies and aligning energy development with the broader sustainability goals. Third, people matter as much as tools. The effectiveness of an environmental assessment depends on the collective agency, professional competence and collaboration across sectors.

For energy planning and policy, these insights imply that efforts to accelerate the green transition should focus not on weakening environmental assessment, but on strengthening its enabling capacity. This includes investing in early strategic planning, improving coordination across the regulatory frameworks, supporting digitalization and data sharing, and enhancing education and professional networks.

Simplification should be pursued wisely, with an emphasis on improving quality and efficiency rather than reducing the scope or participation.

In conclusion, an environmental assessment can serve as one of the critical bridges between urgency and responsibility in the green energy transition. Done right, it does not slow progress, instead, it helps ensure that progress is durable, legitimate and aligned with the long-term sustainability objectives. As energy systems continue to transform at scale and speed, the role of the environmental assessment as an enabling infrastructure will remain central to achieving a transition that is not only fast, but also fair.

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Povzetek v slovenskem jeziku

Presoja vplivov na okolje: Varovanje narave in pospešitev zelenega prehoda. Pospešeno uvajanje infrastrukture za obnovljivo energijo je temelj evropskega zelenega prehoda, vendar se postopki načrtovanja, presoje in izdaje dovoljenj vse bolj dojemajo kot ozka grla. Ta članek obravnava presojo vplivov na okolje kot omogočitveni okvir, ki lahko podpira hitrejše, bolj usklajeno in bolj legitimno odločanje v kontekstu preobrazbe energetskega sistema. Namesto da bi presojo vplivov na okolje predstavljali kot postopkovno oviro, jo članek konceptualizira kot infrastrukturo za odločanje in upravljanje, ki v energetsko načrtovanje vključuje okoljske, družbene in zdravstvene vidike. Na podlagi nedavnih raziskav in sinteze sodobne prakse članek poudarja pomen zgodnjega vključevanja, sistemskega razmišljanja ter transformativnih pristopov, ki presegajo ozko na skladnost usmerjeno presojo. Posebna pozornost je namenjena ravnotežju med pospeševanjem in poenostavljanjem ter vlogi agencije, sodelovanja in strokovne usposobljenosti. Članek sklene, da dobro zasnovana presoja vplivov na okolje ne upočasnjuje zelenega prehoda, temveč pomaga zagotoviti, da je odporen, legitimen in usklajen z dolgoročnimi cilji trajnosti.