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RESEARCH ARTICLE OPEN ACCESS

Justice Under the Sun: Evaluating Procedural Justice in Large-Scale Solar Park Development

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ABSTRACT

The development of large-scale solar sites (LSS) is expanding to address climate change and profitability challenges in renewable energy. This article evaluates whether such projects can meet procedural justice standards under optimal conditions, examining a case study in southern Sweden. Despite strong institutional frameworks, well-resourced developers, and robust regulations, our analysis reveals significant gaps between procedural form and substantive justice. Using a mixed-methods approach, we evaluate the development process against seven procedural justice conditions: publicity, relevance, inclusion, fair cooperation, appeal and revision, transparency, and post-decision processes. Key challenges include power imbalances between developers and local stakeholders, tensions between national and local interests, insufficient compensation mechanisms, and limited consideration of ecological impacts and future generations. These findings highlight the difficulty of achieving meaningful procedural justice, even under ideal conditions, and underscore the need for frameworks that address power asymmetries, balance competing interests, and ensure fair, inclusive processes.

1 | Introduction

■ My wife cried when we first received the news

In the urgent pursuit of mitigating climate change, transitioning to sustainable and clean energy production is paramount. Solar power, with its great potential for harnessing the sun's energy, emerges as a crucial component of this transition, offering hope for a more sustainable future. However, despite its environmental benefits, solar power has faced significant economic challenges (Christophers 2024). Specifically, solar parks have struggled to yield the same level of profitability as other investments in the general market garnered elsewhere. This disparity in profit margins has precipitated various difficulties, including lower investment incentives and financial feasibility concerns, hindering the broader adoption of solar energy. In response to

these challenges, among others, there has been a noticeable shift toward the construction of exceedingly large solar parks (Bolinger et al. 2023; Nilson and Stedman 2022). These monumental projects, some spanning over 500 ha and more, aim to capitalize on economies of scale and the logistical simplicity of centralized construction. By concentrating resources and operations in vast, singular locations, the industry seeks to bridge the profitability gap and align solar energy investments with the lucrative returns of other market ventures.

While research on large-scale solar (LSS) continues to expand, there remains a critical need for *in-depth analyses* using explicit *procedural justice frameworks*, particularly in contexts with robust institutional capacity and responsive developers. Recent syntheses show that social and environmental injustices persist throughout the solar value chain (Stock and Sareen 2024),

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with public support varying significantly by project scale (Nilson and Stedman 2022). Studies have highlighted concerns raised by residents near proposed or existing LSS, including potential effects on farmland, biodiversity, stormwater runoff, property values, the safety and toxicity of solar panels (Roddis et al. 2020; Cousse 2021; Bessette et al. 2024), social impacts (Dunlap et al. 2024), and the exploitation of rural places (Nilson and Stedman 2022, 2023). These studies identify stakeholders' concerns and propose strategies to improve perceptions and outcomes but frequently omit a thorough examination of procedural justice in these contexts. Although justice-related studies on LSS from regions such as the Global South, including India (Yenneti and Day 2015, 2016; Yenneti et al. 2016) and Mexico (Sankaran et al. 2022), reveal instances of gross injustices, these cases often lacked the institutional frameworks and resources necessary to ensure just processes, raising questions about whether such developments can ever meet justice standards.

This article examines a case in southern Sweden that offers a unique opportunity to evaluate procedural justice under highly favorable conditions. Given Sweden's strong institutions and regulatory standards, failure to achieve procedural justice here casts doubt on its feasibility in less favorable contexts (cf. Flyvbjerg 2006). We use a mixed-methods approach to analyze a LSS project, developing a framework based on seven key conditions of procedural justice: publicity, relevance, inclusion, fair terms of cooperation, appeal and revision, transparency, and post-decision processes. Although LSS projects remain uncommon in Sweden, they are increasing, and this case involves a well-resourced company and county with experience in wind and smaller-scale solar development. The combination of strict regulations and the company's stated commitment to justice and sustainability makes this an exemplary test case. We conducted interviews with stakeholders—including the company, municipal and governmental actors, neighbors, and others—and reviewed documents, email correspondence, and related materials. While the permitting process is ongoing, our findings show a mixed picture: some procedural justice conditions are being met, others are lacking. These discrepancies suggest the need for policymakers, industry, and communities to rethink how large-scale renewable energy projects are implemented. The case raises broader questions about how to ensure procedural justice in LSS projects that aim to be fair, inclusive, and sustainable at both local and global scales.

This article is structured as follows: Section 2 introduces the theoretical framework of procedural justice, detailing its seven key conditions. Section 3 describes our methods and materials, including the case study approach and data collection process. Section 4 examines the LSS development, covering its background, initial consultations, stakeholder engagement, environmental impact assessment, and application review process. Section 5 discusses the findings through the perspective of procedural justice, evaluating how each condition was met and highlighting key challenges. Finally, Section 6 concludes with implications for policy and practice, along with recommendations for future research.

2 | Theory

Justice in energy transitions comprises three interconnected dimensions: procedural, distributive, and recognitional

justice (Sovacool and Dworkin 2015; Ramasar et al. 2022). *Procedural justice* concerns the fairness of decision-making processes; *distributive justice* addresses how benefits and burdens of energy projects are distributed; while *recognitional justice* emphasizes acknowledging different identities and values, particularly of marginalized groups. An important distinction exists between legal compliance—meeting formal procedural requirements—and normative standards of procedural justice developed in moral and political philosophy. The latter concerns whether procedures genuinely empower stakeholders and promote equitable deliberation. In this sense, the distinction resembles that between fulfilling the *letter* of the law and honoring its *spirit*. This article evaluates procedural justice in this deeper philosophical sense, examining whether decision-making processes meet fairness standards that go beyond legal formality.

In what follows, we present a structured account of procedural justice based on seven conditions identified in moral philosophy, political theory, and energy justice research. Procedural justice frameworks mediate between differing values and normative principles, offering guidance for fair decision-making processes. While these frameworks vary across political theorists, philosophers, and energy justice researchers, there is significant overlap in their core elements (see, e.g., Sovacool and Dworkin 2015; Jenkins et al. 2016). The seven conditions outlined here should be seen as necessary, though not necessarily sufficient, for procedural justice (see Table A1 for an overview). Additional conditions may be relevant in specific contexts, but these seven are consistently emphasized across moral philosophy, political theory, and energy justice debates.

The first condition is *publicity*, as emphasized by Daniels and Sabin (2002), Pettit (2012), Fraser (2008), Nussbaum (2011), Sovacool and Dworkin (2015), and Jenkins et al. (2016). Publicity requires that at least the decisions and rationales behind decisions be accessible to the public. This transparency allows stakeholders, including the general public, to examine the decisions and understand the reasoning behind them. Publicity is particularly relevant in solar park projects, where public acceptance often hinges on stakeholders' ability to access and evaluate decision-making information (Bessette et al. 2024). Key questions for evaluating the effectiveness of the publicity condition include:

- Are the details of the decision and its rationale publicly available and accessible to those affected by it and the general public?
- Through what means or platforms is information about the decision disseminated to ensure public accessibility?

Second, is the *relevance* condition (see e.g., Habermas 1985; Daniels and Sabin 2002; Brandstedt and Brölde 2019). The reasons and rationales guiding decision-making processes must be pertinent and grounded in evidence, reasons, and principles that everyone has reasons to accept (see e.g., Habermas (1985) universalization principle; Scanlon (1998) principle of reasonable rejection). When it comes to normative principles and values, formulating reasons that align with reasonable normative theories or considerations is what should

be understood as ‘relevant reasons’ (see e.g., Brandstedt and Brölde 2019). This involves, for example, providing reasons that promote the common good, or reasons grounded in ecological sustainability, such as preserving biodiversity or mitigating climate change (Caney 2010), rather than merely advancing one’s self-interests (Pettit 2012). To assess whether the relevance condition is being adequately fulfilled, it is useful to ask the following:

- Are the reasons and evidence guiding the decision-making process clearly related to the decision at hand?
- Are these reasons and principles reasonably acceptable to all stakeholders involved?

The *inclusion* condition emphasizes engaging all stakeholders in deliberation (Anderson 1999; Fraser 2008; Allen 2004; Pettit 2012; Sovacool and Dworkin 2015; Jenkins et al. 2016). This encompasses both the representation of local knowledge (Jenkins et al. 2016) and participatory inclusiveness in energy justice (Sovacool and Dworkin 2015). Gram-Hanssen (2024) broadens this to include non-human stakeholders—technologies, infrastructure, and environment—recognizing the complex interdependencies in energy systems. Additionally, theorists stress considering absent stakeholders, particularly future generations (Rawls 1971; Caney 2005; Habermas 1996, 2003), advocating for deliberative processes that account for those who cannot directly participate. To assess whether the inclusion condition has been adequately met, key considerations include:

- What methods or processes were employed to involve all relevant stakeholders, current, future, and so on in the decision-making process?
- How was feedback from these stakeholders solicited and incorporated into the final decision?

Fourth is the condition of *fair terms of cooperation* and a *cooperative spirit* (cf., e.g., Habermas (1985) on the ideal speech situation; Anderson (1999) on equal opportunity and the empowerment of individuals; Pettit (2012) on non-domination; Fraser (2008) on participatory parity; Nussbaum (2011); Sovacool and Dworkin (2015); Jenkins et al. (2016); Brandstedt and Brölde (2019)). This cooperative spirit is characterized by mutual respect, reciprocity, and a willingness to seek common ground. Furthermore, some conditions may be more challenging for certain groups to fulfill. Therefore, to ensure a fair and equitable process that is not dominated by stronger parties, these stakeholders might require support to help level the playing field. Thus, we get the following questions:

- What measures were taken to ensure that the decision-making process was characterized by mutual respect and reciprocity among participants?
- What are the examples of how a willingness to find common ground was demonstrated during the process?

Fifth and sixth are the principles of *appeal and revision*, and *regulation and enforcement*. As emphasized by Allen (2004), Nussbaum (2011), Pettit (2012), Jenkins et al. (2016) among

others: There must exist a robust mechanism for challenge and dispute resolution concerning the decisions made. This framework should facilitate the revising and appealing of decisions in the wake of new evidence or compelling arguments. Such a criterion is crucial for ensuring that the decision-making process remains dynamic, adaptable, and responsive to evolving insights and circumstances, thereby allowing for necessary corrections and adjustments over time. As our values change, this also allows public institutions to change with them.

There must also be some form of regulation or enforcement mechanism to ensure the aforementioned criteria are met. This involves oversight by a body or mechanism capable of holding the decision-making process accountable to its standards, ensuring that the process remains fair, transparent, and consistent with the stated principles (see e.g., Tyler 2006; Daniels and Sabin 2002; Pettit 2012; Brandstedt and Brölde 2019). To evaluate how effectively the principles of appeal, revision, regulation, and enforcement are implemented, consider the following questions:

- Is there an established mechanism for stakeholders to challenge or appeal the decision?
- How does this mechanism function?
- How are disputes regarding the decision managed and resolved?

Post-decision processes should maintain engagement with affected stakeholders through three core elements: post-decision voice, impact mitigation, and compensatory actions (Daniels and Sabin 2002; Allen 2004; Nussbaum 2011). Rather than revisiting the decision itself, this phase focuses on implementation and addressing consequences. Decision-makers should take concrete steps to mitigate adverse impacts and provide compensatory measures for affected communities. Such support, whether financial or practical, helps alleviate hardships while demonstrating institutional responsibility and care. To evaluate the extent to which these principles are upheld, the following questions become central:

- Was there an opportunity for affected individuals to express concerns regarding the implementation of the decision?
- What measures were taken to mitigate negative consequences for those directly impacted?
- How were compensatory arrangements handled, and did they adequately address the needs of the affected parties?

Pure procedural justice recognizes that *some burdens cannot be avoided entirely*, and following correct procedures can make outcomes just, even if they burden certain individuals. Someone *might experience negative impacts without being treated unjustly*—the situation may be unfortunate but not unfair. For example, if someone moves to the countryside for a natural setting and later finds themselves living near an LSS, they might feel wronged. However, if they had opportunities to voice concerns and participate in the decision-making process, etc., the outcome, while unfortunate for them, isn’t necessarily unjust. The key distinction is between *experiencing hardship* and *being treated unjustly* through the process itself.

3 | Methods and Materials

This study uses a mixed-methods approach—combining document analysis and semi-structured interviews—to evaluate whether our seven normative conditions of procedural justice were met in a large-scale solar park development. We triangulate data from these sources to strengthen the validity of our findings. The purposive case selection assesses whether procedural justice is achievable under favorable institutional conditions, contributing to broader debates on just energy transitions. In this context, we aim for analytic generalization (Stake 1995; George and Bennett 2005; Gerring 2006; Flyvbjerg 2006). Although the permitting process is ongoing, all key procedural steps relevant to our analysis have been completed, including the company's final application, the County Administrative Board's (CAB) receipt of required documentation, and two rounds of stakeholder feedback. Since our focus is on whether opportunities for fair deliberation, inclusion, transparency, and appeal were meaningfully enabled—not on the outcome's alignment with specific interests—the procedural elements we assess are already concluded.

Our document review encompassed project-related materials including nine formal investigations, technical and consultation reports with 13 annexes (see Table A2) summarizing stakeholder input, email correspondence, meeting minutes, relevant legal frameworks, regulatory guidance, and stated authority ambitions. These documents provided insights into both the formal permitting process structure and different actors' interpretations. We conducted six in-depth semi-structured interviews lasting 1–1.5 h with key stakeholders: the company's CEO, the company project manager, two neighboring property owners directly affected by the solar park, two County Administrative Board representatives (one responsible for the current permitting process and one from another county familiar with similar cases), and a municipal ecologist responsible for environmental oversight. These participants served as both informants providing factual accounts and respondents offering evaluative perspectives on fairness and justice (For an overview of the interviewees, see Table A3). Our analysis involved two cycles of abductive coding, generating broader categories and themes. This coding approach combined deductive and inductive reasoning to move between data and theory and develop new insights. The process was transparent, systematic, and involved individual reviews and team discussions (Watkins 2017).

While we support open science principles, our empirical data cannot be made publicly available due to legal and ethical constraints. The contested nature of the project and small number of participants make full anonymization impossible without compromising confidentiality. Sharing raw data would violate our ethics approval, the Swedish Ethics Review Act (2023, 460), and GDPR requirements. Our approach follows established ethical guidelines for qualitative research (Kaiser 2009; Wiles et al. 2008; Tolich 2004; Norgaard 2011; Pascale et al. 2022), as well as standards from the American Anthropological Association (2012) and the Association of Social Anthropologists of the UK and Commonwealth (2021). To balance transparency with ethical obligations, anonymized excerpts or thematic summaries may be shared with qualified researchers upon request, provided there is no re-identification risk. We ensure analytical transparency through auditable methods and reasoning,

addressing reproducibility through inference logic rather than raw data disclosure.

4 | Results

In this section, we present empirical findings from the LSS case study, organized chronologically to trace the permitting process from site selection to the current decision phase. While we follow a temporal sequence to enhance readability, each phase also provides insight into specific aspects of procedural justice. The site selection, institutional setup, and outline the process (Section 4.1) establish baseline conditions; consultation and engagement activities (Section 4.2) address inclusion and cooperation; the Environmental Impact Assessment (Section 4.3) concerns relevance and transparency of evidence; and the review process (Section 4.4) sheds light on revision, appeal, and final decision-making. Throughout, we examine tensions between formal procedural compliance. For readers seeking a structured assessment of how each of the seven procedural justice conditions was met, see Table A6, which offers a summary linked to our analytical framework (see Section 2).

4.1 | Setting the Stage

The selected case involves a LSS park proposed by a Nordic renewable energy developer with a strong track record in wind and solar power. The company, active across the region, manages projects from development to operation and presents itself as committed to sustainability, democratic values, and energy security (interviewee 1 and 2). To identify a suitable site, the company applied a modified Geographic Information System (GIS) tool to screen all 290 Swedish municipalities (interviewee 2). The tool integrated a set of environmental and logistical parameters to minimize social and ecological disturbance while maximizing efficiency. Priority was given to sites with low residential density, non-agricultural land, minimal ecological or cultural heritage value, and good access to existing infrastructure, such as roads and transmission lines. The selected site—a 450-ha corporately owned forest plot in southern Sweden—was chosen based on its strong alignment with these criteria (interviewee 1, 2, report 6). It is adjacent to four households and is expected to host ~655,000 solar panels, with a projected annual output of 600 GWh.

The company emphasized that the site's southern location would not only improve solar productivity but also help alleviate existing bottlenecks in electricity transmission between northern and southern Sweden (report 6, interviewee 1 and 2). While the firm framed the project in terms of environmental responsibility and geopolitical ethics (e.g., reducing reliance on non-democratic energy suppliers), it also stressed the economic rationale for LSS over smaller installations, citing cost-efficiency and simplified permitting processes (interviewee 1 and 2). Although the company has proposed mitigation measures such as earth berms and wildlife corridors, it has declined to discuss altering the project's scale or location and has no plans to compensate nearby residents for likely losses in property value (report 11). It should be noted that such compensation is neither legally required nor common practice in Sweden for comparable projects.

The permitting process follows Chapter 9, Section 6 of the Swedish Environmental Code (SFS 1998, 808), acknowledging the project's significant environmental impact. Multiple stakeholders participate with varying levels of authority. The County Administrative Board (CAB) serves as the primary authority assessing whether projects meet environmental requirements. Under Chapter 6 of the Environmental Code and the Environmental Assessment Ordinance (SFS 2013, 251), the CAB determines EIA requirements, reviews consultation documentation, requests supplementary information when needed, and makes final permitting decisions. While not organizing public consultations directly, the CAB ensures developers comply with consultation requirements. These responsibilities position the CAB as a key factor in implementing and upholding procedural norms in Swedish environmental permitting processes (see also interviewee 5, 6, and 7).

The municipality holds an advisory role in the environmental permitting process but can exert influence in several ways (interviewee 5, 6, 7). Though not a decision-making authority, it is formally consulted by the CAB during early stages, providing input on compatibility with existing land use plans, development goals, and local environmental concerns. Under the Planning and Building Act (Sveriges 2010, 900), the municipality controls zoning and detailed development plans, indirectly affecting project feasibility. Municipal officials often serve as intermediaries between developers and local stakeholders during public meetings or consultations. Neighbors are recognized as key stakeholders under the Environmental Code, with legal rights to information and comment submission during the consultation process (interviewee 5, 6, 7). They participate through written consultations and public meetings, responding to project documentation including the Environmental Impact Assessment. While neighbors lack decision-making power, their feedback provides the CAB with valuable insights about potential local impacts such as noise, visual intrusion, or land use changes. In this sense, they function as lay experts with situated knowledge about the site and surroundings. For an overview of the key actors and their responsibilities, see Table A4.

The consultation process for the proposed solar park took place in multiple phases between late 2022 and spring 2025 (report 8, 11). It began with early outreach and internal authority consultation, followed by a written consultation phase involving government authorities, local residents, and organizations. A public open-house meeting was held in early 2023. Subsequently, the developer provided written responses, conducted additional assessments, and submitted the first version of the application in April 2024. Stakeholders were given the opportunity to assess and address the developer's responses as part of the ongoing consultation. In October 2024, the CAB requested supplementary materials, which were submitted in December 2024. The process culminated in April 2025, when the Environmental Assessment Delegation at the relevant CAB formally announced the application for a voluntary permit under the Swedish Environmental Code. The application includes a complete Environmental Impact Assessment (EIA). Members of the public were invited to submit written comments to the CAB by May 2025, marking the official close of the public consultation period. This final step initiated the

decision-making phase, with a final ruling expected no later than November 2025. We are currently at this stage in the process, awaiting the final ruling from the CAB. For a project timeline, see Table A5.

4.2 | Initial Consultations and Stakeholder Engagement

Local resident: "Hello, I saw online that you are planning a large solar park in XXX. Is there any additional information available, such as which areas are involved? I live next to [the landowners] property [...], so this is of some interest to me. Thank you in advance." *[email conversation]*.

Interviewee 1: "..., I hope all is well. As mentioned, we intend to build one of Northern Europe's largest solar energy facilities on the [property owners] land and. We are currently compiling the consultation materials, and once they are ready, we will send them to the [...] County Administrative Board. We aim to collaborate with you as nearby residents and to minimize the impact on your local environment as much as possible. Feel free to call me if you have any questions." *[email conversation]*.

From the beginning, the company opted for a comprehensive environmental assessment process under Chapter 9, Section 6 of the Environmental Code (SFS 1998, 808), acknowledging the project's significant environmental impact. As one county administrator noted, "in these cases, they send their lawyers." (Interviewee 5). While resource-intensive and involves more consultation with stakeholders including the local community, this voluntary process offers the developer greater legal security—once approved, the permit cannot be altered under Chapter 24 of the Environmental Code, protecting against future demands. The municipality supported this comprehensive approach as it involves a longer time frame, which reduces stakeholder stress and ensures thorough review (interviewee 7).

The process began with an authority consultation where about 20 participants—including CAB officials, municipal representatives, environmental specialists, cultural heritage advisors, ecologists, consultants, and the developer and landowner—met to discuss plans and investigation requirements (report 8). Following this, consultations were conducted in phases with different stakeholders. Notably, the law *provides no specific requirements for public consultation procedures*, placing the onus on the developer to ensure a respectful, transparent, and inclusive process (SFS 1998, 808, interviewee 2, 6).

After the authority consultation, the written phase ranged from November 2022 to March 2023, targeting authorities, private individuals, interest organizations, and residents within 500 m of the site, as well as those potentially affected by construction noise (report 5). This involved direct letters to stakeholders and newspaper announcements, with the official consultation period running from February 16, 2023, to February 24, 2024.

The process expanded to include a physical open-house meeting in March 2023, where attendees could engage directly with the applicant and environmental consultants (report 8, interviewee 2, 5, 7). Following this meeting, the company provided written responses to all submitted questions and concerns, compiled in a revised consultation report (report 8). All individuals who had submitted comments—or who lived near the proposed site—received a copy of the revised report. They were then invited to submit additional comments in writing (via email or letter). This opportunity to respond to the company's replies constituted the second round of stakeholder input (interviewee 5, report 11).

According to the neighbors, the municipality, and the company, more than 100 people attended the open house meeting—far exceeding the number of residents in the immediate area (interviewee 1—4). Company representatives attributed this high turnout primarily to curiosity (interviewee 2). The municipality was present at the meeting, although it had no formal role in the process; only the company held an official role. The CAB did not attend the meeting at all. A key reason for their absence, as explained by the CAB, was to avoid any misunderstandings about their role as permitting agency (interviewee 5)—although misunderstandings seem to have occurred regardless. For example, the CAB received emails questioning how *they could allow* the park to be built after the consultation, and during our interview with neighbors, they accused the CAB of being uninterested in the neighbors' concerns (report 8, interviewee 5). This was due to alleged ties to the renewable energy industry (interviewee 3, 4), even though the CAB had not weighed in yet.

Accounts of the open house meeting differed somewhat. The company described it as relatively calm, with some attendees voicing criticism and others attending out of general interest (interviewee 2). The criticisms, according to the company and residents, included objections from the closest neighbor, who felt personally affected; skepticism toward solar power from a representative of a political organization advocating for nuclear energy; and concerns about cutting down forests for energy production raised by a representative from an environmental organization (interviewee 2, 3, 4). The representative of the municipality (interviewee 7) was also positive, stating that the representative of the municipality (interviewee 7) was also positive, stating that,

[the company X] hired consultants to prepare the so-called Environmental Impact Assessment (EIA). The consultants were also the ones who facilitated the consultation. They presented the material objectively. And then, when it came time for the Q&A session, the applicant themselves—the actual business—also answered questions. So, it wasn't just the consultants responding. [...] They had even hired an environmental manager [at X], who was a former County Administrative Board officer. So, he definitely knew what he was doing.

Overall, it was, yes, professional. Exactly what I had expected. Of course, one can always debate whether there are more practical or better ways to do it. But no, they did a solid presentation. There was a

thorough Q&A afterward. People were even offered refreshments. So, there was an opportunity to voice their thoughts.

Two neighbors, however, characterized the meeting as tense, describing it as a "sales pitch" and noting that none of the people they spoke to afterward expressed support for the project (interviewee 3, 4). As one neighbor remarked, "I haven't met anyone who thinks it's a good idea. No one." (interviewee 3). Following the meeting the CAB received a few emails from neighbors and later held a follow-up meeting with them. These neighbors expressed a strong sense of disempowerment and exclusion from meaningful influence in the process. One described the experience as feeling "run over" and likened it to living in a feudal system—an expression not meant to be taken literally, but as an emotionally charged articulation of what they perceived as a lack of democratic control. The quote—"It's all so undemocratic. You get run over, sort of. You have no say in anything ... it almost feels like you're sometimes back in the feudal system ... Some local little king owns the land and you can't—but you know. It's, it's, you just get run over ... It's not fair in any way ... We have no voice. No voice at all"—captures this sentiment. While neighbors are formally allowed to raise concerns, they lack any decisive role in shaping or halting the project. This perceived lack of influence helps explain the emotional responses to the development and offers insight into how even legally compliant processes may fall short of normative standards for procedural justice.

The CAB, however, noted that the number of complaints was relatively low compared with many other projects where they often receive 50 or more emails (interviewee 5). Upon reviewing the complaints received after the consultation, we identified seven individuals from three households who strongly objected to the project. Additionally, two individuals from the same household expressed overall support for the project but raised concerns about its current form. These include all the households directly affected by the park (report 8).

The consultation phase illustrates the gap between formal inclusion and substantive influence in procedural justice. While the developer satisfied and even exceeded legal requirements for stakeholder engagement, the stark contrast in perceptions between institutional actors ("professional," "thorough") and affected neighbors ("sales pitch," "undemocratic") might suggest that formal participatory mechanisms failed to create conditions for fair cooperation. The emotional response captured in phrases like "you get run over" reveals how procedural compliance may still leave stakeholders feeling fundamentally disempowered when underlying power imbalances remain unaddressed and meaningful opportunities to affect outcomes are limited.

4.3 | Environmental Impact Assessment and Alternatives

Interviewee 5: "There isn't a single area without conflicts of interest."

Before the open-house meeting in March 2023, the developer had already completed most of the technical assessments

required for the Environmental Impact Assessment (EIA), including biodiversity studies, cultural heritage reviews, and noise modeling (report 1, 3, 5). These findings were presented at the meeting and served as a key reference point for stakeholder discussions (interviewees 2, 3, 4, 7). The purpose of the meeting was not only to disseminate these results but also to invite feedback from local residents, who could offer additional insights or raise issues not previously considered. Following the meeting, the developer addressed all written questions and incorporated relevant feedback into the final version of the EIA, which was submitted to the permitting authority as part of the formal application on April 30, 2024 (report 11).

Because the developer chose to pursue a comprehensive assessment under Chapter 9, Section 6 of the Environmental Code (SFS 1998, 808), the EIA had to systematically evaluate all potential environmental effects of the proposed solar park. This included direct and indirect impacts on air quality, water resources, soil, ecosystems, and biodiversity. The process began with a baseline environmental description of the area, followed by detailed assessments of the scope, duration, and reversibility of identified impacts, and concluded with proposals for mitigation or management of significant risks (report 1, 2, 7).

In terms of investigations, the company's EIA includes a nature value inventory, a bird inventory, a cultural heritage assessment, a hydrological examination, a noise assessment, a site selection analysis, a risk assessment, and a consultation report summarizing feedback and concerns raised by stakeholders during the public and authority consultations (see Appendix A). The EIA is also complemented by a technical description that outlines the design, operation, and infrastructure of the proposed solar park. In line with feedback provided during the consultation meeting, written consultations were also conducted with the following parties: the Fire and Rescue Service, the Swedish Armed Forces, the National Heritage Board, the Swedish Forest Agency, an ornithological society, a local history society, the Swedish Society for Nature Conservation (national, regional, and local branches), the municipality (the Municipal Executive Board and the Environmental Committee), and the Swedish Environmental Protection Agency (report 8, 9). These consultation parties received the consultation documents and a cover letter via email on February 23, 2023 (except for the Swedish Environmental Protection Agency, which received the materials via postal mail).

The site examination followed several steps (report 1, 2, 9). A nature value inventory was conducted according to Swedish Standard SS 199000:2014 and technical report SIS-TR 199001:2014, with field work carried out over 3 days in August 2022. The process began with studying known nature values and previous species findings, followed by on-site mapping. A bird inventory was performed across eight sub-areas, documenting and counting all bird species observed. For cultural heritage assessment, the team carried out an archaeological inventory that included archival research, map analysis, and field surveys using GNSS and ArcGIS tools to document features like stone walls. The hydrological examination assessed water flow patterns and documented the effects of historical ditching on the

area's wetlands. A noise assessment using SoundPLAN version 8.2 modeled both construction impacts, particularly from pile-driving, and operational noise levels. All findings were mapped and categorized according to standardized classification systems for future reference.

An important part of the EIA is to consider alternative ways to implement the project that can reduce negative environmental impacts (report 9, 11). This involves considering alternative locations for the solar park, different technologies for solar panels, or changes in the scope of the project. Based on this assessment, the developer develops a plan to manage the negative environmental impacts. This plan can include preventive measures, mitigation measures, compensatory measures, or monitoring plans to ensure that the environmental impact remains within acceptable limits. The results of the EIA are finally documented in a report, which is used as a basis for decisions on the project's implementation. Decision-making authorities take this report into account when assessing whether the solar park should be approved and under what conditions.

In this case, the primary issue was not the forest, which was largely industrially planted and scheduled for logging due to bark beetle infestations, but concerns about wildlife movement and potential flooding on the wet, tree-cleared land (interviewee 2, report 1, 2, 9). While a 30-m tree buffer zone was planned to shield the park from view, the company decided against fencing the perimeter to allow free wildlife passage. Flooding risks prompted detailed studies on soil saturation and water redirection, resulting in strengthened mitigation measures. The company also plans to restore moorland that existed before tree planting, incorporating ecological restoration into the project. Despite limited research on the environmental impacts of large-scale solar parks, particularly regarding soil quality, the company expressed openness to collaboration and has offered researchers access to the site (interviewee 1, 2). A Swedish university has shown interest, and the municipal ecologist (interviewee 7) emphasized the importance of advancing projects like this to address climate change, trusting in society's ability to adapt and fill knowledge gaps over time.

Neighbor opinions on the proposed solar park varied significantly (report 8). Two generally supportive neighbors offered constructive suggestions to improve community acceptance, including a 100-m buffer zone along paved roads with forestry allowed in the outer 50 m to maintain a forested appearance. They also proposed planting low-growing trees and shrubs near the park to support aesthetics and wildlife corridors, maintaining a 500-m distance from residences, and preserving cultural heritage sites with 100-m buffers. They emphasized integrating natural features, avoiding "edge-to-edge" panel installation in sensitive areas, and balancing solar development with environmental protection. These demands were not met by the company in their last and final proposal (report 11).

Conversely, other neighbors expressed strong opposition, claiming the project would harm local values and natural assets, disrupt wetlands and biodiversity, and destroy the area's cultural and natural character (report 8). They criticized the consultation as a superficial "sales concept," questioned the sustainability of solar power, and warned the project would conflict

with the municipality's "green wedge" designation, leading to depopulation and rural decline. Concerns about carbon release from logging, impacts on nearby nature reserves, and long-term environmental effects were central to their arguments, with some advocating for alternative energy solutions like nuclear or smaller-scale solar developments in less sensitive areas such as on rooftops and on highways, just to mention two examples.

Something that is not raised in these processes are some of the broader implications of the project. For example, the neighbors we interviewed argued that the profits would primarily benefit foreign investors, with little economic gain for the local community. As interviewee 3 said, "It's just stupid and it's unfair. It ... It benefits no one. Except the owners, that is ..." The municipality, for its part, highlighted concerns about potential unfairness in the distribution of this and similar projects (interviewee 7). Specifically, these parks are often situated in the rural periphery where residents have fewer resources and are thus less able to mount a defense against such developments. As a comparison, there had been discussions about placing wind turbines along the coastal band in the same municipality, ~1 km from shore according to the municipal ecologist (Interviewee 7). These turbines would have been barely visible and even less audible from land. However, this project was abandoned, largely because the coastal residents possessed substantial resources to oppose it.

The EIA process demonstrates both strengths and limitations in meeting relevance and inclusion conditions of procedural justice. The comprehensive technical assessments and standardized methodologies ensured environmental impacts were systematically evaluated, addressing some aspects of relevance. However, the process revealed deficiencies in incorporating local values and addressing procedural justice concerns. The unmet demands of even supportive neighbors and the developer's unwillingness to consider alternative scales or provide compensation highlight how technical compliance with EIA requirements may still fall short of meeting broader normative standards of procedural justice, particularly when economic benefits accrue primarily at national rather than local levels.

4.4 | Application Review and Decision-Making

When the stakeholder consultation and EIA was done, the developer submitted their application to the CAB on April 30, 2024. The CAB then forwarded a "supplementation request" to the municipality, to its own experts, and to other authorities such as the Swedish Transport Administration, the Swedish Forest Agency, the Swedish Board of Agriculture, etc. Once their comments had been received, the environmental assessment delegation (a branch of the CAB) decided they needed additional information (Environmental Permitting Delegation 2024). This was in October 2024. In this case, the EIA needed to better demonstrate alignment with the Municipality's Green Wedges designation and provide additional visualizations of the park's appearance from nearby roads and homes within 500m. The application also required clearer plans for habitat restoration, including maps showing how broom and heather habitats and sheep grazing would integrate with the unfenced park. Other required additions included: fire safety measures to prevent soil and water contamination, species protection assessments

for amphibians, reptiles, and club moss, protective measures for blasting activities, expanded noise assessment covering all operational sources, and plans to mitigate solar glare affecting residents.

The company completed all the required additions in December 2024, and the CAB determined that the application was complete and that no further information was needed from the company in March 2025 (Environmental Permitting Delegation 2025). In April, the application was announced in local newspapers reaching at least 5% of households in the municipality—a threshold based on administrative practice to fulfill the requirement of "sufficient public notice" under Chapter 19, Sections 4–5 of the Environmental Code. The announcement was also published on the CAB's website, in line with procedural transparency obligations. The complete application has been sent for consultation to a number of authorities to assess whether it should be approved. Residents and other stakeholders also have the right to submit comments, including those who did not participate earlier in the process—this right stems from the same provision and is reinforced by principles in the Administrative Procedure Act (Förvaltningslagen, Sveriges 2017, 900). The comment period is 30 days, meaning that new comments may be submitted up to 30 days after the announcement, which falls in May 2025. Requests for extensions may also be submitted—for example, if the municipal council or environmental committee does not meet frequently. This is the current stage of the process.

Once all comments have been received, they are compiled by the CAB and forwarded to the company for response. The company typically has around 3 weeks to reply—this timeline follows standard administrative practice and allows the CAB to consider both stakeholder concerns and the developer's justifications before issuing a decision. After this exchange, the CAB makes its final decision. According to Chapter 19, Section 5 of the Environmental Code, the decision must be issued within 6 months of the application being deemed complete—that is, by November 2025 in this case. Once the decision is made, it must be clearly justified, particularly when it involves restrictions such as injunctions or prohibitions. In accordance with the Environmental Code and the Administrative Procedure Act, the CAB must explain the applicable regulations and the key factors that influenced the decision. The justification must allow stakeholders to understand the reasoning, assess its legal validity, and evaluate whether it is well-balanced. It should focus on the significant circumstances, address objections raised during the process, and include an overall assessment of the site. This includes explaining why the site is or is not considered appropriate for solar development. The CAB must also demonstrate that the decision is proportionate and how the balancing of interests was conducted, taking into account factors beyond the operator's control, such as grid connection challenges. If extensive precautionary measures are required, the reasoning must be especially detailed.

The decision is then announced in local newspapers and on the CAB's website where they also state the appeal period (interviewee 5). All who have submitted comments receive a copy. From the date of the decision, there are 35 days to appeal. This applies to both the company and other affected parties. If the decision is appealed, the appeals are forwarded to the Land

and Environment Court. The CAB only checks if the appeals have been submitted on time. If they have, the case is directly forwarded to the court. The company receives a copy of the timeliness review to see that it has been appealed. Since there is a process before the application is submitted, the process from screening consultation to the environmental assessment delegation's decision typically takes about a year, according to the respondent at the county (interviewee 5). While the appeal mechanism is a legally guaranteed component of the permitting process, its practical effectiveness depends on multiple factors. In the Swedish system, only about 21% of appeals to the Land and Environment Court of Appeal (Mark-och miljööverdomstolen) are granted leave to appeal (Domstolsverket 2017). However, when leave is granted—especially in complex environmental permitting cases—decisions are reversed or modified in ~76% of cases, rising to over 90% in permit-related matters. This indicates that while the system filters out weaker claims, it subjects qualifying cases to rigorous scrutiny. As such, the appeal process serves both as a safeguard and a test of procedural robustness: well-documented, substantively grounded decisions are generally upheld unless clear flaws are demonstrated or new evidence emerges.

Having traced the procedural elements of this LSS development from initial site selection through to the current application review phase, we now evaluate how each of the seven procedural justice conditions identified in our theoretical framework was addressed in practice. Table A6 presents this assessment, linking specific evidence from our case study to each condition and offering a critical evaluation of the extent to which normative standards of procedural justice were achieved.

5 | Discussion

This case study of a LSS in southern Sweden reveals fundamental tensions in achieving procedural justice under supposedly ideal conditions. Despite Sweden's strong regulatory framework, the developer's self-declared commitment to sustainability, and extensive formal consultation processes, our study exposes significant gaps between procedural requirements and meaningful justice outcomes. The formal elements of procedural justice—publicity, inclusion, and appeal mechanisms—were largely satisfied through comprehensive documentation, multi-stage consultations, and clear legal pathways for stakeholder input. However, deeper analysis reveals that meeting procedural requirements does not necessarily ensure genuine procedural justice. This gap manifested in four key areas:

First, structural power imbalances between the developer and the neighbors—and potentially between the CAB and the neighbors—undermined the effectiveness of formal procedures. The developer's superior resources and expertise, including access to specialized consultants and years of preparation, created fundamental inequalities that formal consultation processes failed to address. As evidenced in our interviews, the company had hired consultants to prepare the EIA and even employed a former CAB officer as their environmental manager, giving them significant expertise advantage. This disparity was particularly evident when contrasted with the coastal wind power case mentioned by the municipality, where wealthy communities

successfully opposed development, while less-resourced rural areas struggled to engage meaningfully. The municipality representative specifically noted that projects are often situated in rural peripheries where residents have fewer resources to mount effective opposition. These findings align with Yenneti and Day's (2016) observations that procedural mechanisms can obscure and perpetuate existing power dynamics.

Second, the case reveals tensions between different scales of justice—local versus national interests. While the company's site selection process prioritized national renewable energy goals and applied systematic criteria to minimize environmental impacts, it seems to have failed to meaningfully engage with the lived experiences and values of local stakeholders. For rural residents, nature often holds personal, cultural, and symbolic significance, serving as a space for recreation, hunting, and tradition. As interviewee 3 expressed emotionally upon hearing about the project: "My wife cried when we first received the news." The term used for consultation ("samråd") further heightened expectations about local influence, contributing to frustration when participants realized that procedural mechanisms implied more democratic control than they actually delivered. As one neighbor stated: "It's all so undemocratic. You get run over, sort of. You have no say in anything ... it almost feels like you're sometimes back in the feudal system ... Some local little king owns the land and you can't—but you know. It's, it's, you just get run over ... It's not fair in any way ... We have no voice. No voice at all." These sentiments reflect a gap between formal procedural inclusion and stakeholders' sense of actual influence—an issue that resonates with Ottinger's (2013) concept of *epistemic injustice*, where local knowledge is systematically excluded from decision-making processes.

This dynamic also exemplifies broader patterns of spatial and symbolic marginalization. Nilson and Stedman (2023) argue that rural communities are often structurally disadvantaged in renewable energy planning, both through institutional processes and public discourse. The undervaluation of rural stakeholders' relationships with nature and place can intensify perceptions of unfairness, particularly when decision-making is perceived as externally imposed and economically skewed. As one neighbor summarized: "It benefits no one. Except the owners, that is ..." At the same time, this case illustrates a deeper ethical problem: rural communities, which have historically borne a disproportionate share of national and global environmental burdens, are now being asked to support large-scale renewable projects under the same logic. Caney (2010) and Gardiner (2011) caution against the use of global climate imperatives to justify local sacrifices without adequate recognition or compensation. Gardiner describes this as a form of "moral corruption," where the urgency of climate mitigation is invoked to override legitimate local concerns. These tensions underscore the need for procedural justice frameworks that go beyond formal compliance to address historical burdens, distributive inequities, and the normative legitimacy of imposing local costs for global benefits.

Third, compensation and post-decision engagement emerged as critical shortcomings. While the developer met all formal requirements, the lack of standardized compensation and limited opportunities for post-decision input left affected residents feeling powerless and unfairly burdened. The company stated

it had “no plans to compensate neighbors for potential losses,” a stance confirmed in interviews and project documentation. Though legally permissible, this approach falls short of normative procedural justice, which demands attention to the fairness of both decision-making and its consequences. Minimal accommodations—such as earth berms, watchtowers, and security patrols—were offered to those whose properties will be surrounded by the solar park. Such measures do little to address the deeper asymmetries of burden and influence. Procedural justice should extend beyond formal compliance to include tangible efforts at impact mitigation and recognition.

Notably, voluntary compensation models do exist in Sweden. For example, Svenska Cellulosa Aktiebolaget (SCA) has introduced a revenue-sharing scheme for households near its wind farms (SCA 2024), and some developers have established local community funds. The government’s inquiry *SOU 2023:18—Värdet av vinden* has proposed formalizing such measures, including fixed household payments and local investment funds (Swedish Government Official Reports 2023). While not binding, these efforts signal growing recognition that procedural legitimacy includes sharing benefits as well as burdens. Still, even with such mechanisms, perceptions of injustice may persist—especially among those who experience direct impacts. This case illustrates that legality and precedent alone may not ensure legitimacy. Without meaningful post-decision engagement, procedural justice risks being undermined by both material inequities and unmet expectations. Yet, privileging local resistance without normative grounding can also shift burdens to less powerful communities elsewhere. Achieving fair outcomes requires balancing local concerns with broader principles of justice and equity.

Fourth, the inclusion of future generations and non-human life remains a significant challenge for procedural justice. In this case, while the company emphasized sustainability goals in their documentation and during consultations, the procedural framework did not explicitly address how future generations might benefit—or bear the costs—of the project. Similarly, the consultation process gave limited attention to ecological considerations beyond immediate compliance with regulatory standards. While the EIA included a nature value inventory, bird inventory, and hydrological examination, our analysis shows that these were conducted primarily to satisfy formal requirements rather than to meaningfully incorporate ecological perspectives into decision-making. This was evident in the CAB’s supplementation request, which had to specifically ask for additional species protection assessments for amphibians, reptiles, and club moss initially overlooked. This case also illustrates a deeper dilemma in energy and environmental ethics: how to meaningfully compare the small, cumulative global benefits of a given renewable energy project (such as reduced emissions) with potentially significant local harms to ecosystems and biodiversity. Similar tensions have arisen in other contexts, such as large-scale solar projects in the Mojave Desert that threaten habitat for desert tortoises, or urban densification initiatives that reduce tree canopy and biodiversity. Gardiner (2011) warns that in the absence of normative guidance, such trade-offs risk “moral corruption,” where global urgency is invoked to bypass legitimate local concerns. Caney (2010) likewise argues for moral thresholds that prevent local sacrifices from being justified solely by aggregate

climate goals. These debates highlight the importance of developing frameworks that do not treat non-human nature as merely instrumental. Gram-Hanssen (2024) addresses this by calling for an ethics-of-care approach to energy justice that explicitly includes non-human actors as ethically relevant stakeholders. Without such conceptual and procedural innovations—including ecological expertise and representation for future generations—procedural justice risks reinforcing an anthropocentric logic that overlooks the broader ethical obligations inherent in sustainability transitions.

All in all, our findings have important implications for procedural justice theory. Traditional frameworks emphasizing transparency, inclusion, and appeal rights may be necessary but insufficient conditions for justice. As Sovacool and Dworkin (2015) argue, energy justice requires not just procedural safeguards but systemic reform to address embedded inequalities in how energy decisions are made and whose interests they serve. Our case suggests the need for expanded frameworks that address power asymmetries in knowledge and resources, integration of different justice scales from local to national, standardized compensation mechanisms, long-term stakeholder engagement, protection for vulnerable communities, and clear delineation between consultation and co-decision rights. Moreover, the findings highlight a fundamental paradox in renewable energy justice: while procedural justice aims to give stakeholders voice, achieving urgent climate goals may require limits on local veto power. This suggests a need for more sophisticated frameworks that can balance meaningful participation with timely action on climate change.

For practice, our findings indicate the need for several concrete improvements. Affected stakeholders require access to independent technical and legal expertise to meaningfully participate in complex development processes. Standardized compensation frameworks must be developed to ensure fair treatment across projects and communities. Guidelines for balancing local and national interests need clarification, while extended timeframes for stakeholder review and response could help address temporal inequalities. Additionally, specific mechanisms to protect vulnerable communities from disproportionate impact are essential for ensuring equitable development patterns. We recognize, however, that the effectiveness of such reforms depends on their design and implementation. For example, how much access to expertise is meaningful, what constitutes a fair compensation model, or how long timeframes should be—all these questions require further empirical and normative work. Moreover, even with well-designed procedures, there is no guarantee that all stakeholders—especially those most negatively affected—will feel their interests have been adequately addressed even though this might have been the case.

6 | Conclusion

This study of a LSS development in southern Sweden reveals important insights about the challenges and possibilities of achieving procedural justice in large-scale renewable energy projects. Our analysis demonstrates that even under favorable conditions—with well-resourced developers, strong regulatory frameworks, and established democratic institutions—achieving

genuine procedural justice remains complex and challenging. While some aspects of procedural justice were adequately addressed, particularly in terms of formal processes and information sharing, other elements fell short of theoretical ideals and stakeholder expectations. The case highlights a crucial tension between local autonomy and broader societal goals in renewable energy development. While the company's site selection process and reasoning aligned with national renewable energy objectives, it struggled to adequately address local concerns and values. This tension was exacerbated by the absence of standardized compensation mechanisms and clear frameworks for balancing competing interests at different scales.

These findings have important implications for policy and practice. First, they suggest that procedural justice frameworks need to evolve beyond checklist-style requirements to address power imbalances and ensure meaningful participation. This might include providing affected stakeholders with independent technical and legal expertise, developing standardized compensation frameworks, and creating clearer guidelines for stakeholder engagement. Second, there is a need for more comprehensive national-level planning to ensure fair distribution of renewable energy projects across different regions and socioeconomic communities. However, it is important to note that procedural justice should *not* be misunderstood as a guarantee of universal satisfaction or the complete avoidance of conflicts. A procedurally just process may still result in decisions that some stakeholders oppose, and the presence of dissatisfied parties does not necessarily indicate a failure of procedural justice, even though you should be mindful of such misgivings among the stakeholders. The goal is to ensure that decisions are made through fair, inclusive, and transparent processes, even when consensus cannot be achieved. Moreover, stakeholder sentiments and preferences, while important to consider, should not be given undue weight in decision-making processes. Their concerns might sometimes be irrelevant to procedural justice considerations or could potentially lead to worse outcomes if projects are relocated to areas where they would have greater negative impacts on other stakeholders who may have fewer resources to voice their concerns. A truly just process must balance local stakeholder interests against broader societal needs and the potential impacts on alternative locations and communities.

Looking ahead, our study points to several important areas for future research. There is a need to better understand how different jurisdictions balance competing demands in renewable energy development and to identify best practices for ensuring both procedural fairness and stakeholder satisfaction. Additionally, research should explore innovative approaches to stakeholder engagement and compensation that could help bridge the gap between procedural form and substance. While our findings suggest that achieving perfect procedural justice may be an unrealistic goal, they also indicate that significant improvements are possible. The challenge lies in developing more sophisticated frameworks that can better handle the complexities of large-scale renewable energy development while ensuring fair and inclusive processes. As the urgent need to address climate change drives continued expansion of renewable energy infrastructure, these insights become increasingly critical for ensuring just and sustainable energy transitions.

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Appendix A

TABLE A1 | Overview of the seven conditions and key questions.

Condition	Key questions
Publicity	Are the details of the decision and its rationale publicly available and accessible to those affected by it and the general public? Through what means or platforms is information about the decision disseminated to ensure public accessibility?
Relevance	Are the reasons and evidence guiding the decision-making process clearly related to the decision at hand? Are these reasons and principles reasonably acceptable to all stakeholders involved?
Inclusion	What methods or processes were employed to involve all relevant stakeholders in the decision-making process? How was feedback from these stakeholders solicited and incorporated into the final decision?
Fair Terms of Cooperation	What measures were taken to ensure that the decision-making process was characterized by mutual respect and reciprocity among participants? What are the examples of how a willingness to find common ground was demonstrated during the process?
Appeal and Revision	Is there an established mechanism for stakeholders to challenge or appeal the decision? How does this mechanism function? How are disputes regarding the decision managed and resolved?
Post-Decision Processes	Was there an opportunity for affected individuals to express concerns regarding the implementation of the decision? What measures were taken to mitigate negative consequences for those directly impacted? How were compensatory arrangements handled, and did they adequately address the needs of the affected parties?

TABLE A2 | Overview of the reports.

No.	Title	Description
1	Nature Value Inventory	Survey of ecological values in the project area, including protected species and habitats.
2	Bird Inventory	Inventory of bird species observed in the area, with emphasis on breeding indicators.
3	Cultural Environment Assessment	Assessment of the cultural and historical features potentially affected by the project.
4	Surface Water Study	Study of surface water conditions, including hydrology and water quality considerations.
5	Noise Assessment	Evaluation of potential noise impacts from the planned solar facility.
6	Site Suitability Analysis	Analysis of the proposed site's suitability and alternatives for project location.
7	Risk Assessment	Assessment of risks related to the construction and operation of the solar park.
8	Consultation Summary	Summary of stakeholder consultations and issues raised during the planning process.
9	Environmental Impact Assessment	Full environmental impact assessment, integrating all thematic studies and proposed mitigations.
10	Technical Description	Technical details of the planned solar installation, including layout and infrastructure.
11	Main Application Document	Main application document submitted to authorities, including legal and procedural information.

TABLE A3 | List of interviewees.

Interviewee	Role
Interviewee 1	Company's CEO
Interviewee 2	Project manager
Interviewee 3	Neighbor
Interviewee 4	Neighbor
Interviewee 5	CAB representative responsible for permitting process
Interviewee 6	CAB representative from another county
Interviewee 7	Municipal ecologist responsible for environmental oversight

TABLE A4 | Key actors, roles, and responsibilities.

Actor	Role	Key responsibilities	Legal reference (Miljöbalken)
CAB (County Administrative Board)	Primary decision-making authority	<ul style="list-style-type: none"> – Evaluates EIA – Coordinates consultation – Issues or denies permits 	Ch. 6 (EIA), Ch. 9 (hazardous activities), Ch. 16–17 (permits and appeals)
Municipality	Advisory body with zoning authority	<ul style="list-style-type: none"> – Provides land-use input – Ensures alignment with local plans 	Ch. 6 (consultation), Plan-och bygglagen (PBL) reference
Environmental Agencies (e.g., Forest Agency, EPA)	Technical consultative agencies	<ul style="list-style-type: none"> – Provide expert advice on environmental risks and regulatory compliance 	Ch. 6 (consultation), Ch. 26 (supervision)
Other Authorities (e.g., Swedish Transport Administration, Armed Forces, National Heritage Board)	Sector-specific consultees	<ul style="list-style-type: none"> – Provide local knowledge – Comment on EIA – Appeal decisions 	Ch. 6 (public participation), Ch. 16–17 (legal remedies)
Developer	Responsible party initiating the process	<ul style="list-style-type: none"> – Conducts EIA – Initiates consultation – Responds to feedback 	Ch. 2 (general duties), Ch. 6 (EIA)
Neighbors and Public	Stakeholders with rights to comment and appeal	<ul style="list-style-type: none"> – Provide local knowledge – Comment on EIA – Appeal decisions 	Ch. 6 (public participation), Ch. 16–17 (legal remedies)

TABLE A5 | Project timeline.

Date	Event description
Nov 2022	Initial authority consultation
Feb–Mar 2023	Written consultation and public meeting
Apr 2024	Application submitted to CAB
Oct 2024	CAB requests supplementary information
Dec 2024	Company submits additional materials
Mar–Apr 2025	Application deemed complete and announced
May 2025	Public comment period ends
Nov 2025	Expected final ruling by CAB

TABLE A6 | Key findings.

Procedural justice condition	Evidence from case study	Assessment
Publicity	<ul style="list-style-type: none"> Application was announced in local newspapers reaching at least 5% of households Detailed information published on the CAB's website Written notifications sent directly to stakeholders within 500 m Public open-house meeting held in March 2023 All documentation made accessible to the public 	Largely met, though some neighbors perceived information as promotional rather than objective. The company's decision-making rationale was sometimes less transparent than the procedural steps themselves.
Relevance	<ul style="list-style-type: none"> Company used GIS-based site selection across 290 municipalities Reasoning emphasized climate goals, energy security, and geopolitical ethics Economic rationale for large-scale development provided Technical assessments (noise, biodiversity, cultural heritage) conducted CAB required additional information to demonstrate alignment with local planning designations 	Partially met. While technical and environmental reasons were well-documented, local values and lived experiences received less consideration. Economic benefits were framed in national rather than local terms.
Inclusion	<ul style="list-style-type: none"> Consultation with authorities, residents within 500 m, and organizations 100+ attendees at public meeting Two rounds of stakeholder input Written consultation with multiple agencies and stakeholder groups 	Formal inclusion mechanisms existed but neighbors reported feeling "run over" and lacking "voice." Future generations and ecological perspectives were included only through regulatory frameworks rather than dedicated representation.
Fair Terms of Cooperation	<ul style="list-style-type: none"> Company employed former CAB officer as environmental manager Developer maintained power to determine project scale and location No requirement to accommodate local requests Significant resource disparities between company and neighbors Respectful communication from the company where some demands were met Different outcomes for coastal wind power (wealthy area) vs. rural solar (less resourced) 	Partially met. Power imbalances were evident and unaddressed. The company's expertise advantage was substantial, and no mechanisms existed to equalize resources or ensure cooperative spirit. Yet, the company was open and respectful in their communications, and they were not completely denounced of meeting demands from the residents.
Appeal and Revision	<ul style="list-style-type: none"> Clear legal pathway for appeals to Land and Environment Court 35-day appeal period after decision Structured process for company to respond to stakeholder comments 	Formally adequate but observers question whether rural stakeholders have resources to effectively utilize appeal mechanisms compared with wealthy coastal communities.
Transparency	<ul style="list-style-type: none"> Detailed EIA documentation Multiple consultation rounds Written responses to all comments Decision justification requirements 	Generally met in terms of procedural transparency.
Post-Decision Processes	<ul style="list-style-type: none"> No standardized compensation framework Company explicitly stated "no plans to compensate neighbors for potential losses in real estate value" Minimal accommodations offered (earth berms, security patrols) Unclear long-term stakeholder engagement plans No mechanism for ongoing community input 	Significant deficiencies. The absence of compensation or meaningful post-decision engagement mechanisms represents a major gap in the procedural justice framework. Long-term impact mitigation remains inadequately addressed.

Appendix B

A semi-structured interview guide serves as a flexible framework for conducting qualitative interviews. It outlines key topics and open-ended questions that ensure consistency across interviews while allowing the interviewer to adapt follow-up questions based on the interviewee's responses. This method supports the collection of rich, detailed data while maintaining enough structure to facilitate comparative analysis. In this case, the guide is designed to explore stakeholder experiences and perceptions related to procedural and distributive justice in solar energy projects.

When interviewing residents living near a park or other local site potentially affected by the installation, the formulation of questions was to some extent different, reflecting their position as community members rather than project stakeholders or decision-makers. For example, instead of asking "How was the specific site for your solar installation decided?", we asked "How did you first hear about the plans for the solar installation, and what were your initial thoughts?" to better capture their perspective and concerns. Below is a translated guide from Swedish to English, followed by the original guide in Swedish.

Interview Guide: Just Solar Energy

Interview Topics

Introduction123

- Hi, my name is [name], and I'm here as part of [project or organization]. Thank you for taking the time to speak with us today. Before we begin, I'd like to ask if it's okay to record this interview to ensure we don't miss anything you say. Is that alright with you?
- All the information you provide will be treated confidentially and used solely for the purposes of this project. You can stop the recording or ask for it to be deleted at any time. Does that sound okay to you?
- Could you tell me a little about yourself? How long have you been working as a...?

Understanding and Relationship to the Solar Installation

- How would you describe [the solar installation]?
 - How long has it been in operation?
- Can you describe your role in relation to [the solar installation]?
 - Direct or indirect involvement?
- At which stage(s) of the process?
 - Same role throughout or different roles?
 - What challenges have you encountered during the development and implementation of the project?

Site Selection for the Solar Installation, Including Land Use

- How was the specific site for your solar installation decided?
 - Who was invited to discuss this?
 - What influence did the different parties have?
 - Who set the agenda?
 - What background material was used?
- What were the main considerations regarding land use for this project?
 - Ecological?
 - Economic?
 - Justice-based?
- What other uses of the site/land might have been possible, and how do they compare with its use for solar energy?
 - Cultivation, grazing?
- Were there any conflicts of interest, goals, values, groups, or similar related to your solar installation?
 - If so, what were they, and how were they handled? Did you have any support in managing the conflicts?
 - Do you think there's a better and fairer way to handle such conflicts? What would you need to achieve that?

Costs and Benefits

- Who has borne the cost during the process?
- What are the different costs and benefits associated with the installation, and who receives or must bear them?
- Would you say that the right actors are the ones receiving the benefits and bearing the burdens?
 - In your view, is the distribution of burdens and benefits among different actors fair?
 - If not, what would a fairer distribution look like?

General Perspective on the Energy Transition in Sweden and the Role of Solar Power, Including This Installation

- How would you describe the current energy situation in Sweden?
 - What opportunities exist?
 - What challenges exist?
- How would you describe the role of solar power in the energy situation?
 - What are its strengths and weaknesses?
 - Are there differences in how these issues are handled in urban versus rural areas?
- How does [the solar installation] fit into the energy situation?

Future Vision

- If we return to [the solar installation], who will benefit from it in the long term?
 - Could this change over time? If so, how?
- What is the expected lifespan of the installation? What happens after that?
 - Are there plans for what will happen afterward, such as recycling or restoration?
- What is your view of the future for solar energy projects in Sweden, specifically in relation to land use and the urban-rural dynamic?
- What measures or changes do you think would be needed to ensure a fairer use of land for solar energy, if any?
 - Can we create more just processes? Can you give examples of how this could be achieved?
 - Can we achieve a more equitable distribution of installations across the country, or is the current situation acceptable?
 - Can we distribute benefits and costs more fairly? If so, what would that look like, and how could it be implemented?

Conclusion

- Have you thought of anything important that we missed asking about?
- Do you have suggestions for anyone else with relevant experience whom we should interview?

Intervjuguide Rättvis Solenergi

Intervjuteman

Introduktion

- Hej, mitt namn är [namn] och jag är här som en del av. [projekt eller organisation]. Tack för att du tar dig tid att tala med oss idag. Innan vi börjar undrar jag om vi kan spela in den här intervjun för att säkerställa att vi inte missar något av det du har att säga. Är det okej för dig?
- All information du ger kommer att behandlas konfidentialt och kommer endast att användas för syftet med detta projekt. Du kan när som helst välja att avbryta inspelnningen eller begära att den raderas. Låter detta ok tycker du?
- Kan du berätta lite om vem du är? Hur länge har du jobbat som...?

Förståelse och relation till solelanläggningen

- Hur skulle du beskriva [Solelanläggningen]?
 - Hur länge har den varit i gång?
- Kan du berätta om din roll kopplat till [Solelanläggningen]?
 - Direkt eller indirekt involvering?
- Under vilken del av processen?
 - Samma roll eller olika roller?
 - Vilka utmaningar har du stött på under projektets utveckling och implementering?

Val av plats för solelanläggningen, inkl. markanvändning

- Hur bestämdes den specifika platsen för din solelanläggning?
 - Vilka bjöds in för att diskutera detta?
 - Vilket inflytande hade de olika parterna?
 - Vem bestämde agendan?
 - Vilket underlag användes?
- Vilka var de viktigaste övervägandena när det gäller markanvändning för detta projekt?
 - Ekologiska?
 - Ekonomiska?
 - Rättvisebaserade?
- Vilka andra användningsområden för platsen/marken kunde ha varit möjliga och hur jämför dessa med användningen för solenergi?
 - Odling, bete?
- Fanns det några konflikter mellan intressen, mål, värden, grupper eller dylikt kopplade till din solelanläggning?
 - Vilka var dessa i så fall och hur hanterades de? Hade ni något stöd för att hantera konflikterna?
 - Finns det något bättre och mer rättvist sätt att behandla sådana konflikter tror du? Vad skulle ni behöva för att åstadkomma detta?

Kostnader och nyttor

- Vem har stått för kostnaden under processen?
- Vad finns det för olika kostnader och nyttor kopplade till anläggningen och vem får ta del av eller måste bärta dessa?
- Skulle du säga att det är rätt aktörer som får ta del av nyttorna och bärta bördorna?
 - Är fördelningen mellan bördor och nyttor mellan olika aktörer rättvis enligt dig?
 - Om inte, hur skulle fördelningen se ut för att vara mer rättvis?

Allmän syn på energiomställningen i Sverige och solelens, liksom anläggningens, del i detta

- Hur skulle du beskriva energiläget vi har i Sverige?
 - Vilka möjligheter finns?
 - Vilka utmaningar finns?
- Hur skulle du beskriva solelens roll i energiläget?
 - Vad är styrkor och svagheter?
 - Finns det skillnader i hur dessa frågor hanteras i stads- och landsbygdsområden?
- Hur kommer [Solelanläggningen] in i energiläget?

Framtidsvision

- Om vi återvänder till [Solelanläggningen], vem får ta del av nyttorna på sikt i framtiden?
 - Kan de komma att ändras? Hur då?
- Vilken livstid har anläggningen? Vad händer sen?
 - Finns planer på vad som händer efteråt, t ex återvinning och återställning?
- Hur ser du framtiden för solenergiprojekt i Sverige, specifikt i förhållande till markanvändning och stads-landsbygdsdynamik?

- Vilka åtgärder eller förändringar tror du skulle behövas för att säkerställa en mer rättvis användning av mark för solenergi om det behövs några?

- Kan vi skapa mer rättvisa processer? Kan du ge exempel på hur detta skulle kunna gå till?
- Kan vi skapa en mer jämlig fördelning av anläggningar landet över eller är det bra som det är?
- Kan vi fördela nyttor och kostnader mer rättvist? Vad skulle det vara i så fall och hur skulle det kunna åstadkommas?

Avslut

- Har du tänkt på något viktigt som vi har missat att fråga?
- Har du tips på någon person som har viktiga erfarenheter som vi borde intervju?