

Louvain School of Management

Economic Opportunities and Stakeholder Trade-Offs in Solar Photovoltaic Development on Underutilized Land: Evidence from Wallonia

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1 Introduction

The transition to a low-carbon energy system has made the expansion of renewable electricity a central policy and managerial challenge. Among the available technologies, solar photovoltaic (PV) energy has acquired a particularly important role because of its modularity, declining costs, and relatively rapid deployment potential. At the same time, the growth of utility-scale solar raises increasingly important land-use questions. Solar projects occupy visible space and require access to the electricity network. This means that their development increasingly intersects with competing land uses, local planning priorities, and stakeholder expectations. As a result, the challenge is no longer only to expand solar capacity, but also to determine where and under what conditions this expansion can be achieved in a way that is both economically viable and socially legitimate (Wüstenhagen et al., 2007; Carlisle et al., 2016).

This issue is particularly relevant in Wallonia, where renewable electricity development is increasingly shaped by land-use constraints, permitting complexity, and distribution-grid limitations. In this regional context, the question is not only whether solar PV projects can contribute to the energy transition, but also whether land availability, stakeholder legitimacy, and grid access can be aligned within economically viable projects. Wallonia therefore provides a relevant empirical setting for examining how underutilized land can support solar PV development while generating specific economic, institutional, and infrastructural trade-offs. The thesis consequently focuses exclusively on the Walloon context, where the interaction between land-use pressures, stakeholder legitimacy, and grid saturation has become particularly significant for utility-scale solar development.

In this context, underutilized land has emerged as a potentially attractive development option. Pastures¹, polluted sites², brownfields³, former landfills⁴, backfilled areas⁵, and other weakly valorised or constrained spaces may appear to offer opportunities for renewable energy

¹ Pastures refer to grassland primarily used for grazing livestock or other agricultural activities.

² Polluted sites refer to land affected by environmental contamination and often requiring remediation or monitoring measures before redevelopment.

³ Brownfields are previously developed or industrial sites that are abandoned, underused, or potentially contaminated and may require remediation before redevelopment.

⁴ Former landfills are closed waste disposal sites that may be repurposed after environmental stabilization, remediation, and long-term monitoring.

⁵ Backfilled areas refer to land previously filled with excavation, industrial, or waste material and subsequently rehabilitated or reused.

production while reducing direct pressure on more contested land uses. Such sites can support narratives of land revalorization, multifunctionality, remediation, or territorial benefit, and may therefore seem especially relevant in regions where land competition is intensifying. However, underutilized land does not constitute a homogeneous or frictionless category of opportunity. Sites that appear attractive because they are degraded, weakly used, or politically easier to justify may also involve specific technical, environmental, regulatory, or infrastructural constraints. Conversely, projects that seem promising in principle may still face stakeholder resistance, administrative ambiguity, or prohibitive grid⁶ connection costs. The relevance of underutilized land for solar PV development must therefore be assessed through the concrete trade-offs that shape project feasibility in practice (McCarthy, 2002; van den Berg & Tempels, 2022; Zeddies et al., 2025).

This issue is both academically and managerially relevant. From an academic perspective, the literature has generated important insights into the social acceptance of renewable energy, stakeholder conflict, land-use legitimacy, and renewable energy investment under uncertainty. Research shows that broad support for renewable energy does not automatically translate into support for specific projects once siting decisions create visible and uneven local trade-offs (Wüstenhagen et al., 2007; Sütterlin & Siegrist, 2017). It also shows that land category matters, because solar projects are evaluated in relation to the type of landscape and land use being transformed (Carlisle et al., 2016). In parallel, the investment literature demonstrates that renewable energy projects are highly sensitive to policy credibility, revenue stability, and uncertainty, which shape financing conditions, investment timing, and project bankability⁷ (Boomsma et al., 2012; Neuhoff et al., 2022; Rydehell et al., 2024). Yet these perspectives remain insufficiently integrated when it comes to explaining how land-specific legitimacy issues become economically consequential for solar PV developers. In particular, limited attention has been paid to the way different categories of underutilized land reshape the relationship between stakeholder dynamics, infrastructural constraints, and economic feasibility.

⁶ Grid connection refers to the physical and technical integration of a renewable energy project into the electricity network, enabling electricity injection, distribution, or local consumption.

⁷ Bankability refers to the extent to which a project is considered sufficiently financially robust and low-risk to attract external financing.

This question is equally important from a managerial perspective. Developers, landowners, public authorities, industrial actors, and local communities need to understand not only whether a site is available, but whether it can be transformed into a viable solar project once stakeholder expectations, permitting conditions, business model choices, and grid access are taken into account. In that sense, underutilized land should not be understood as a simple reserve of easy opportunities, but as a set of development contexts in which opportunities and constraints are configured differently depending on land type and project model.

Against this background, this thesis examines the economic opportunities and trade-offs associated with solar PV development on underutilized land. More specifically, it addresses the following research question: **What are the economic opportunities and trade-offs of developing solar PV projects on underutilized land, and how do land type, stakeholder dynamics, and grid constraints shape project feasibility?** The central argument of the thesis is that project feasibility cannot be explained by land availability, stakeholder acceptance, or technical performance in isolation. Instead, it results from the interaction between land-specific legitimacy, stakeholder influence, infrastructural conditions, and economic viability.

To answer this question, the thesis adopts a qualitative multiple-case study design based on ten solar PV development projects located on different types of underutilized land, complemented by one expert interview on project sourcing and early-stage opportunity screening. The thesis is structured as follows. The first chapter develops the literature review and conceptual framework. The second chapter presents the methodology. The third chapter contains the empirical analysis. The fourth chapter discusses the findings considering the literature and clarifies the theoretical contribution of the study. The final chapter concludes by answering the research question, outlining the main implications of the findings, acknowledging the limitations of the study, and suggesting avenues for future research.

2 Literature Review

2.1 Social acceptance as a land-specific and perception-driven constraint

The social acceptance literature shows that broad support for renewable energy does not automatically translate into support for specific projects once siting decisions create visible and uneven local trade-offs (Wüstenhagen et al., 2007, p. 2685). Wüstenhagen et al. distinguish socio-political acceptance, community acceptance, and market acceptance, thereby showing that general support for renewables must be separated from acceptance at the project level and from dynamics involving market actors (Wüstenhagen et al., 2007, pp. 2684–2686). For utility-scale solar, this distinction is critical because conflict emerges less from abstract attitudes toward solar power than from how concrete projects are perceived by local stakeholders. In that sense, community acceptance is not simply a matter of support or opposition, but of whether a project is seen as fair, legitimate, and credible in a particular place (Wüstenhagen et al., 2007, pp. 2684–2686).

This point is reinforced by Sütterlin and Siegrist, who argue that public support often declines when people move from abstract evaluations of renewable energy to concrete evaluations of local projects (Sütterlin & Siegrist, 2017, p. 358). They show that solar energy tends to benefit from highly positive abstract representations because its negative consequences and associated trade-offs are typically weakly represented in people's mental models (Sütterlin & Siegrist, 2017, p. 362). Once projects are framed in local and place-specific terms, however, acceptance becomes more conditional. This shift should not be reduced to a narrow NIMBY⁸ explanation, because local concerns may reflect perceived unfairness, landscape impacts, procedural distrust, or doubts about the distribution of project benefits rather than simple opposition to renewable energy (Sütterlin & Siegrist, 2017, p. 363). Together, these contributions establish a first core mechanism: acceptance depends on how stakeholders interpret locally distributed impacts, decision-making procedures, and the credibility of the actors involved, rather than on general attitudes toward renewable energy alone (Wüstenhagen et al., 2007, pp. 2684–2686; Sütterlin & Siegrist, 2017, pp. 358, 362–363).

Evidence from utility-scale solar siting confirms that these perception dynamics are strongly shaped by place. Carlisle et al. find a significant difference between general support for large-

⁸ NIMBY ("Not In My Backyard") refers to situations in which individuals support a project or policy in principle but oppose its implementation near their own living environment.

scale solar and support for building such projects nearby, showing that local acceptance introduces additional evaluative criteria beyond general pro-solar sentiment (Carlisle et al., 2016, p. 495). Crucially, they argue that proximity does not operate independently of land context because “not all land is created equal” (Carlisle et al., 2016, p. 495). Preferred buffer distances vary according to land category and visibility assumptions, which suggests that stakeholders do not react to solar projects in the abstract, but to the specific type of landscape and land use being transformed (Carlisle et al., 2016, pp. 495–497). Social acceptance is therefore best understood as a land-specific, perception-driven constraint on solar development: projects are judged not only by what they produce, but by where they are located, what local burdens they are seen to create, and whether the siting decision is perceived as fair and legitimate (Wüstenhagen et al., 2007, pp. 2684–2686; Carlisle et al., 2016, pp. 495–497).

This first body of literature clarifies why community acceptance matters, but it does not by itself explain why stakeholders interpret the same project differently or why such divergence sometimes escalates into binding conflict. To understand that, a second step is needed: acceptance must be connected to stakeholder heterogeneity, justice concerns, and influence processes.

2.2 From stakeholder perception to conflict: uneven burdens, justice, and legitimacy

A stakeholder perspective helps explain why the same solar project can generate different and sometimes opposing interpretations. Harrison et al. argue that stakeholders evaluate organisational actions through distinct utility functions that reflect different preferences over tangible and intangible outcomes (Harrison et al., 2010, pp. 58–60, 62). Applied to solar siting, this implies that conflicts do not primarily arise from misunderstanding or irrational opposition, but from the fact that different actors attach different weights to landscape change, financial compensation, agricultural continuity, environmental improvement, local identity, or long-term development opportunities. Perception conflicts are therefore structurally produced by heterogeneous stakeholder evaluations rather than by a simple lack of information (Harrison et al., 2010, p. 59).

These differences become more conflict-prone when perceived burdens are locally concentrated. Wüstenhagen et al. place distributional justice at the heart of community acceptance, highlighting that stakeholders assess not only whether a project produces benefits, but also how costs and benefits are distributed (Wüstenhagen et al., 2007, p. 2685). Empirical

work on property values gives this distributive question a more concrete dimension. Dröes and Koster interpret local house-price effects near renewable energy projects as evidence that burdens may be unevenly distributed, and they find a decrease in house prices near solar farms within a small radius (Dröes & Koster, 2021, pp. 1–2). Elmallah et al. similarly analyse property values and proximity to photovoltaics and connect their findings to place-specific implications for large-scale solar development and policy design (Elmallah et al., 2023). These studies do not exhaust the meaning of local burden, but they do show that opposition can be grounded in impacts that are economically concrete for some stakeholders while the broader societal benefits remain more diffuse. The result is a structurally uneven evaluative terrain in which projects can be supported in principle yet contested in practice (Dröes & Koster, 2021, pp. 1–2; Elmallah et al., 2023).

Distributional perceptions, however, are only part of the story. Social acceptance research also emphasises procedural justice and trust, meaning that stakeholders evaluate how decisions are made and whether the actors involved are credible (Wüstenhagen et al., 2007, p. 2685). Energy justice broadens this perspective by distinguishing distributional, procedural, and recognition dimensions, thereby showing that legitimacy depends not only on outcomes and procedures, but also on whether affected groups are meaningfully acknowledged and treated as relevant stakeholders (Heffron & McCauley, 2017, pp. 658–659). Heffron and McCauley further note that justice principles are often weakly translated into practice, which helps explain why fairness claims at the policy level do not necessarily resolve conflict at the project level (Heffron & McCauley, 2017, p. 660). In parallel, Harrison et al. treat procedural justice as a central stakeholder perception and argue that fair process can matter as much as outcome itself (Harrison et al., 2010, p. 65). Acceptance therefore depends not only on what stakeholders receive, but also on whether they feel included, recognised, and treated fairly throughout the decision-making process.

Conflict becomes especially consequential when negative perceptions are translated into influence. Frooman's stakeholder influence framework is important here because it explains how dissatisfied stakeholders can affect project outcomes through direct or indirect strategies and through control over resource relationships (Frooman, 1999, pp. 191, 197–198). His argument implies that conflict matters not merely as a matter of attitude, but as a condition under which stakeholders can delay, reshape, or constrain projects if they possess sufficient leverage or can mobilise others who do (Frooman, 1999, p. 203). This clarifies why community

acceptance becomes binding in practice: not because attitudes automatically determine outcomes, but because perceptions of unfairness and illegitimacy can translate into pressure on permitting, local support, political backing, or project design (Wüstenhagen et al., 2007, pp. 2684–2686; Frooman, 1999, pp. 191–203).

The community renewables literature adds an important nuance by showing that benefit-sharing and involvement do not automatically solve these problems. Walker and Devine-Wright distinguish a process dimension and an outcome dimension of “community renewables,” thereby linking acceptance simultaneously to meaningful participation and to who actually benefits (Walker & Devine-Wright, 2008, p. 497). They show that resentment can emerge when the label of community does not match either the process or the distribution of outcomes (Walker & Devine-Wright, 2008, pp. 499–500). Warren and McFadyen similarly report more positive attitudes when communities are directly involved, suggesting that participation can affect acceptance, but not independently of how it is structured and perceived (Warren & McFadyen, 2010, p. 211). For utility-scale solar, van den Berg and Tempels show that community benefits can reduce opposition yet also report that misaligned compensation may undermine trust and increase resistance (van den Berg & Tempels, 2022, pp. 1, 9). The literature thus suggests that conflict is not only about whether benefits exist, but whether they fit local needs, emerge through legitimate processes, and are perceived as fair. This turns social acceptance into a negotiated and conditional outcome rather than a simple attitudinal variable.

At this stage, the literature explains why perception divergence emerges and how it escalates into conflict. What remains less clear, however, is how these conflicts materialise in project design and siting decisions, and under what conditions they can be managed rather than merely described.

2.3 Acceptance as a negotiated project condition: design, multifunctionality, and feasibility trade-offs

In utility-scale solar development, conflicts over acceptance materialise most clearly when siting decisions are translated into negotiations over project conditions. Carlisle et al. show that reactions to large-scale solar vary according to land type, visibility, and assumptions about landscape change, suggesting that objections are often directed less at solar technology as such than at a specific siting choice and its local implications (Carlisle et al., 2016, pp. 495–497). This is consistent with Wüstenhagen et al.’s argument that acceptance becomes most

consequential when projects move from abstract support into concrete implementation decisions affecting particular communities (Wüstenhagen et al., 2007, pp. 2684–2686). In practice, this means that local conflict often takes the form of demands to relocate, redesign, mitigate, compensate, or otherwise modify a project so that its burdens, benefits, and symbolic meaning become more acceptable.

This dynamic is particularly visible when local burdens are perceived as concentrated and therefore negotiable. Elmallah et al. connect property-value concerns to policy-relevant responses and mitigation measures, suggesting that conflict may generate concrete demands for project adjustment rather than pure rejection (Elmallah et al., 2023). Frooman's framework helps interpret these demands as influence strategies aimed at altering the project's terms rather than merely expressing dissatisfaction (Frooman, 1999, pp. 191–203). In that sense, social acceptance is not only a social or attitudinal variable; it functions as a source of constraints that can reshape project design, timing, and governance.

The literature further suggests that acceptance can be improved when projects are reframed as delivering locally valued functions rather than imposing one-sided burdens. Van den Berg and Tempels describe community benefits as a way of reducing opposition, but stress that their effectiveness depends on local context, perceived relevance, and meaningful community involvement (van den Berg & Tempels, 2022, pp. 1, 9). This is a crucial insight because it shows that benefit provision alone is insufficient: acceptance is improved not by compensation in the abstract, but by benefits that stakeholders perceive as legitimate and relevant. Where developers define benefits unilaterally, the result may be symbolic compensation that deepens mistrust rather than reducing it (van den Berg & Tempels, 2022, p. 9). The literature therefore moves beyond the simplistic idea that more benefits automatically increase acceptance. Instead, it points to a more demanding mechanism in which distributive fit, procedural legitimacy, and recognition jointly shape whether project adjustments are seen as meaningful.

Agrivoltaics⁹ provides an especially important illustration of this logic. Zeddies et al. show that agrivoltaics is perceived more positively than open-space solar on agricultural land because it reduces the impression that solar development displaces agricultural value (Zeddies et al., 2025). They find that landscape impacts are perceived as less negative and that willingness to

⁹ Agrivoltaics (or Agri-PV) refers to the co-location of agricultural activities and photovoltaic electricity production on the same land area.

pay for electricity from agrivoltaics is higher than for electricity from open-space solar, suggesting that co-location can improve acceptance by reframing the project as a compromise rather than a zero-sum land-use conversion (Zeddies et al., 2025). Yet the same study also reports that agrivoltaics involves lower energy output per hectare and higher installation costs than open-space solar, making it less attractive from a purely economic perspective (Zeddies et al., 2025, pp. 1–2). This creates one of the central tensions in the literature: the project features most likely to improve legitimacy may simultaneously reduce technical efficiency or financial attractiveness. Acceptance-enhancing design is therefore not a frictionless solution, but a trade-off whose feasibility depends on the developer's ability to absorb added costs, lower productivity, or increased complexity.

This tension becomes even more important when acceptance dynamics are placed in a broader investment context. If local opposition leads to redesign, delay, added mitigation, or more complex benefit arrangements, those social constraints become economically significant only insofar as they interact with the project's risk exposure, financing conditions, and policy environment. The literature on acceptance and the literature on renewable investment therefore need to be connected more directly than they usually are. Acceptance matters not only because it shapes public legitimacy, but because it can alter the cost, timing, and bankability of solar projects.

2.4 When local legitimacy meets investability: policy risk, revenue stability, and land-specific feasibility

The feasibility of utility-scale solar projects depends not only on local acceptance, but also on the policy and financial conditions under which developers operate. Menanteau et al. distinguish quantity-based and price-based support instruments and show that policy design matters because it structures the incentives and risks associated with renewable investment (Menanteau et al., 2003, pp. 799–800). Mitchell et al. similarly evaluate support schemes through a risk-reduction lens, distinguishing price, volume, and balancing risks and arguing that some instruments, such as feed-in systems, can provide long-term stability even if they are not necessarily the most efficient in the short term (Mitchell et al., 2006, pp. 2–3). This literature is important because it shows that “effective” policy cannot be understood only in terms of nominal support level; it must also be understood in terms of how predictable and credible the resulting revenue environment is.

Investor-oriented work strengthens this point. Bürer and Wüstenhagen argue that policies can fail not because they are insufficiently generous, but because they do not align with investor preferences and perceptions of risk, and they find that expansion-stage investors rate feed-in tariffs ¹⁰ as particularly effective because of their stability and credibility (Bürer & Wüstenhagen, 2009, pp. 2, 7). Policy-mix scholarship makes a similar point from a broader governance perspective by arguing that policies should be analysed not only through their formal instruments, but also through their credibility and the processes through which they emerge and interact (Rogge & Reichardt, 2016, pp. 3–4). Flanagan et al. further argue that policy instruments should be understood in relation to broader interactions, tensions, and policy processes rather than as neutral tools (Flanagan et al., 2011, p. 708). These insights are highly relevant here because they suggest that the ability of developers to respond to local acceptance demands depends partly on whether the policy environment provides enough stability to absorb redesign, delay, or additional compensation.

Real options approaches make this dependence more explicit by framing renewable investment as a decision under uncertainty in which waiting can have value. Boomsma et al. show that renewable investment profitability depends heavily on public incentives and that uncertainty around support schemes, electricity prices, and capital costs can generate wait-and-see behaviour (Boomsma et al., 2012, pp. 1–2). Rydehell et al. similarly argue that changing subsidy levels, budget limits, and long waiting times can encourage some investors to postpone investment, and they find heterogeneous responses across investor groups (Rydehell et al., 2024, p. 9). Pan et al. extend this logic to solar panel producers and show that policy uncertainty affects strategic investment timing beyond the project level itself (Pan et al., 2019, pp. 2–6). Neuhoff et al. add that exposure to power-price volatility affects financing costs and that revenue-stabilising support designs can improve financing conditions by reducing uncertainty (Neuhoff et al., 2022, pp. 3–5). Auctions similarly change the risk profile of projects by introducing competition and sunk bidding costs, which require developers to price risk carefully into their strategies (Stetter et al., 2020, pp. 4–5).

Taken together, this literature suggests that local acceptance constraints do not affect all projects equally. Their practical significance depends on the degree to which developers face tight margins, volatile revenues, competitive allocation systems, or policy uncertainty. In a

¹⁰ A feed-in tariff is a policy mechanism that guarantees renewable energy producers a fixed price for the electricity they inject into the grid over a defined period.

stable and supportive policy environment, developers may be better able to accommodate stakeholder demands through redesign, compensation, co-location, or delay. Under conditions of uncertainty or tight risk exposure, the same acceptance demands may become prohibitive. This means that the viability of solar projects cannot be explained by local legitimacy alone or by financial logic alone. It must be understood as the result of their interaction.

This interaction becomes especially important when moving from generic siting debates to underutilized land. Agricultural land, brownfields, and former landfills do not simply represent different physical sites; they reshape which burdens are perceived as salient, which benefits are credible, and which forms of accommodation are feasible. Land type therefore acts not only as a descriptive category, but as a contextual moderator of the relationship between stakeholder acceptance and project feasibility.

On agricultural and pastureland, acceptance is shaped by the symbolic and functional meaning of the land itself. Carlisle et al. show that land category matters for acceptability, implying that stakeholders evaluate solar projects in relation to what the land is understood to be for and what kind of landscape transformation is seen as legitimate (Carlisle et al., 2016, pp. 495–497). Agrivoltaics responds directly to this issue by reducing the impression that solar development displaces agricultural use, thereby making co-location a compromise mechanism that can improve acceptance (Zeddies et al., 2025). Yet because it also involves lower output per hectare and higher installation costs, it illustrates the broader argument of this review: what improves social legitimacy may weaken project attractiveness from a developer perspective (Zeddies et al., 2025, pp. 1–2).

Brownfields introduce a different configuration. McCarthy defines them as under-utilized or abandoned sites with actual or suspected contamination and shows that redevelopment is constrained by liability concerns, uncertain cleanup standards, funding challenges, and regulatory complexity (McCarthy, 2002). At the same time, he frames brownfield redevelopment as linked to sustainable development, environmental justice, and meaningful community participation (McCarthy, 2002). Brownfields may therefore appear attractive because they avoid direct competition with agricultural land, but they also generate distinctive legitimacy and feasibility challenges rooted in contamination perceptions, redevelopment uncertainty, and participation requirements. In this context, procedural justice and recognition may be especially important because the issue is not only what the site becomes, but who

decides, who benefits, and whether redevelopment addresses broader community goals (Wüstenhagen et al., 2007, pp. 2684–2685; Heffron & McCauley, 2017, pp. 658–660; McCarthy, 2002).

Former landfills again shift the acceptance bargain in a different way. Van den Berg and Tempels show that solar development on such sites can be linked to aftercare financing, thereby creating a locally intelligible value proposition beyond electricity generation (van den Berg & Tempels, 2022, pp. 1, 8). Yet they also report concerns about access, and the loss of previous site uses, such as walking areas, which shows that even degraded or closed sites are not socially neutral (van den Berg & Tempels, 2022, p. 8). The implication is that underutilized land should not be treated as automatically less conflictual. Rather, each land type reshapes which stakeholder perceptions dominate, which mitigation or compensation strategies appear legitimate, and how easily acceptance constraints can be reconciled with project feasibility.

Across these land contexts, the same broad mechanism remains visible: land type influences what stakeholders perceive as the relevant burdens, benefits, and justice issues; these perceptions shape acceptance and conflict; and the resulting constraints interact with policy and investment conditions to determine whether a project remains viable. The literature is therefore highly informative on each part of the chain, but less developed in explaining how these parts fit together in a single land-specific framework for utility-scale solar PV on underutilized land.

2.5 Literature synthesis and analytical positioning

Taken together, the literature shows that utility-scale solar projects are evaluated not only through general support for renewable energy, but through stakeholder perceptions of local burdens, benefits, procedural fairness, recognition, and trust (Wüstenhagen et al., 2007, pp. 2684–2686; Sütterlin & Siegrist, 2017, pp. 358, 362–363). It also shows that these perceptions vary with siting context and can lead to demands for redesign, compensation, co-location, or other project conditions (Carlisle et al., 2016, pp. 495–497; van den Berg & Tempels, 2022, pp. 1, 9; Zeddies et al., 2025, pp. 1–2). In parallel, a separate body of literature demonstrates that renewable investments are highly sensitive to policy credibility, revenue stability, and financing risk, which shape the feasibility and timing of investment decisions (Boomsma et al., 2012, pp. 1–2; Neuhoﬀ et al., 2022, pp. 3–5; Rydehell et al., 2024, p. 9). However, these literatures remain insufficiently integrated.

More specifically, existing research does not yet explain clearly enough how land-specific acceptance constraints become economically consequential for developers, nor how underutilized land types such as pastures, brownfields, and former landfills reshape the trade-off between local legitimacy and project feasibility. The acceptance literature explains why conflict emerges but is often less precise about how that conflict translates into binding project conditions. The investment literature explains how risk and uncertainty affect renewable development but generally pays limited attention to the social and territorial origins of those constraints. Finally, while land-type differences are repeatedly acknowledged, they are not yet sufficiently theorised as contextual moderators that alter both stakeholder perceptions and the feasibility of accommodating them. This leaves an important gap in understanding when solar PV on underutilized land can create value for both stakeholders and developers, and when that value is undermined by unresolved tensions between acceptance and feasibility.

2.6 Conceptual framework

The literature reviewed above suggests that the feasibility of utility-scale solar PV projects on underutilized land cannot be explained by social acceptance, investment conditions, or land characteristics in isolation. Instead, project feasibility emerges from the interaction between land-specific legitimacy dynamics and broader conditions of investability. To make this relationship analytically explicit, this thesis develops a conceptual framework in which land type acts as a structuring variable that shapes both the nature of stakeholder concerns and the feasibility conditions under which these concerns become economically consequential.

More specifically, the framework rests on four core assumptions. First, land type influences how a project is perceived, justified, and contested. Agricultural land, polluted sites, former landfills, and other underutilized land categories do not constitute equivalent development contexts. They shape which burdens are perceived as salient, which benefits are considered legitimate, and which forms of project adaptation are seen as acceptable. Land type therefore structures the legitimacy environment in which the project is evaluated.

Second, stakeholder dynamics influence project feasibility primarily through indirect economic mechanisms rather than through direct opposition alone. The literature on social acceptance, stakeholder theory, and energy justice shows that legitimacy depends on how stakeholders interpret burdens, benefits, procedures, and recognition. In project development terms, these legitimacy dynamics become consequential when they generate redesign, delay, procedural

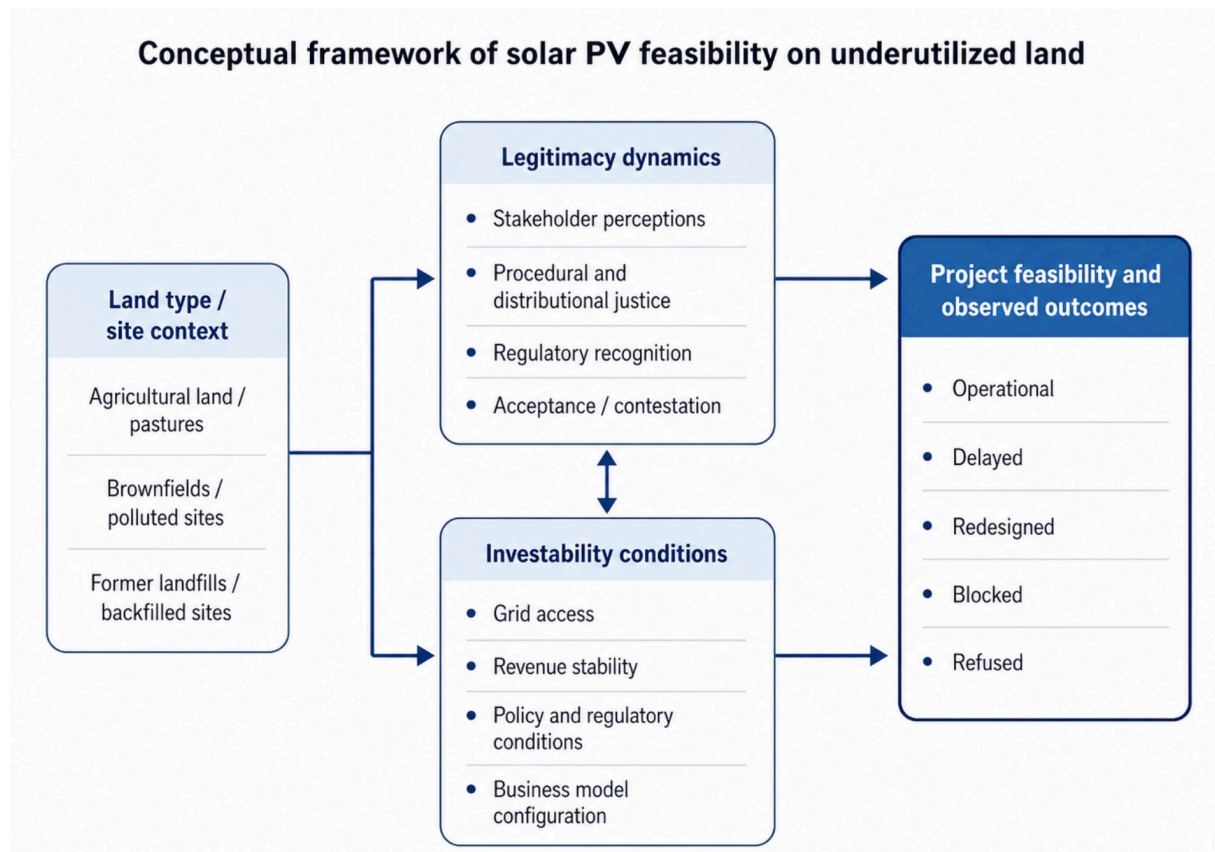
complexity, uncertainty, or the need for compensation and adaptation. Stakeholder influence should therefore be understood not only as an attitudinal variable, but as a mechanism through which project costs, timelines, and strategic choices are reshaped.

Third, these legitimacy-related pressures interact with broader investability conditions. Even when a project is locally acceptable or can be adapted to become more legitimate, its implementation still depends on whether it remains financeable and strategically attractive under prevailing policy, market, and infrastructure conditions. Grid access is particularly important in this respect. As the investment literature shows, renewable energy projects are highly sensitive to revenue stability, financing conditions, and uncertainty. In the context of solar PV on underutilized land, grid constraints can therefore mediate the extent to which local legitimacy can be translated into actual project viability.

Fourth, project feasibility is best understood as the outcome of the interaction between legitimacy and investability rather than as the result of either dimension alone. A project may be legitimate but not investable, for example when grid connection costs become prohibitive. Conversely, a project may be technically and economically attractive in principle but remain unviable if it cannot establish sufficient legitimacy within its land-use and stakeholder context. The feasibility of solar PV on underutilized land is therefore conditional on alignment across multiple dimensions rather than determined by one dominant factor.

On this basis, the conceptual framework of this thesis treats land type as a structuring variable, stakeholder dynamics and grid conditions as key mediating mechanisms, and project feasibility as the resulting outcome. This framework guides the empirical analysis by making it possible to compare how different land categories generate different configurations of legitimacy pressure, infrastructural constraint, and economic trade-off. It also provides the basis for moving from descriptive case comparison to a more explicit explanation of why some projects progress while others are delayed, redesigned, blocked, or abandoned.

Figure 1 summarizes the conceptual framework developed in this thesis and illustrates how land type structures legitimacy dynamics and investability conditions, which jointly shape project feasibility and observed project outcomes.



Source: Author's own elaboration.

This framework provides the analytical bridge between the literature review and the empirical strategy presented in the following methodology section.

3 Methodology

This thesis adopts a qualitative multiple-case study design to investigate the economic opportunities and stakeholder trade-offs associated with solar photovoltaic development on underutilized land in Wallonia. A qualitative approach is appropriate because the phenomenon under study is strongly context-dependent and cannot be reduced to purely technical or financial variables. As the literature review has shown, the feasibility of solar PV projects on underutilized land depends not only on land availability, cost conditions, or connection possibilities, but also on stakeholder perceptions, institutional legitimacy, land-specific constraints, and the interaction between social acceptance and economic viability. The objective of the empirical part is therefore not to isolate variables statistically, but to understand how these dimensions interact in practice across concrete development cases. In line with the conceptual framework presented at the end of the literature review, the empirical strategy seeks to analyse how land type structures legitimacy dynamics and investability conditions, and how these jointly shape project feasibility and project trajectories.

More specifically, the empirical research is based on a qualitative multiple-case study strategy. This approach is well suited to a research question that seeks to understand how and under what conditions project opportunities and trade-offs emerge across different land contexts. Case study research makes it possible to analyse complex real-world processes in depth while preserving the contextual richness necessary to understand project development dynamics. In the present thesis, the case study design allows comparison across projects developed on different types of underutilized land, including agricultural land, pastures, polluted sites, former landfills, and backfilled areas. Rather than aiming for statistical representativeness, the objective is analytical comparison. The purpose is to identify recurring mechanisms, meaningful contrasts, and land-specific patterns that help explain when underutilized land supports viable solar PV development and when it does not.

The empirical material is based on ten project-level cases. These cases were selected purposively rather than randomly, because they provide variation along several dimensions central to the research question, namely land type, stakeholder configuration, project status, dominant constraint, and economic outcome. The sample includes projects that are operational, under development, delayed, redesigned, blocked, or refused. This variation is analytically important because it makes it possible to study both realized and unrealized development

trajectories, as well as intermediate situations in which projects remain technically feasible but economically fragile. The case selection logic therefore follows a principle of analytical relevance: the selected cases were considered capable of illuminating different configurations of feasibility and constraint across land categories.

The primary empirical material was collected through project-level interviews structured around a standardized case questionnaire. Each interview focused on one project and followed the same broad structure in order to ensure comparability across cases. The standardized project case questionnaire used for all interviews is reproduced in Appendix A (p.46). More specifically, the questionnaire covered the initial rationale of the project, the characteristics of the land and site, the main stakeholders involved, the principal blocking points encountered during development, grid connection conditions, economic and strategic trade-offs, and the final or current status of the project. This standardized structure was used as a common data collection template, while still leaving room for project-specific details and examples. In that sense, the interviews were guided and systematic rather than fully open-ended, but they remained qualitative in nature because respondents were encouraged to explain project dynamics, identify key tensions, and elaborate on the reasoning behind specific development decisions.

In addition to the ten project-level interviews, one complementary expert interview was conducted with a professional involved in project sourcing and early-stage opportunity screening. The purpose of this additional interview was not to create an eleventh case, but to enrich the analysis by capturing the logic through which certain sites are pursued, deprioritized, or abandoned before formal development begins. This source was particularly useful for understanding *ex ante* filtering mechanisms related to residential proximity, grid access, and perceived stakeholder risk. The use of this expert interview therefore complements the project-level cases by extending the analysis upstream, to the stage at which opportunities are first identified and evaluated.

The project interviews were not treated as isolated narratives, but as comparable case records. After each interview, the information was consolidated into a standardized project case questionnaire in order to produce a consistent case file for each project. This step was important because it transformed relatively heterogeneous qualitative material into a structured empirical base suitable for cross-case comparison. In addition, one complementary source of empirical

material was used in the Virton case: a citizen survey conducted in relation to the project (see Appendix E, p.82). This material is analytically valuable because it introduces a direct stakeholder perspective into a dataset otherwise based mainly on developer-side accounts. Although the empirical chapter remains primarily organized around project-level case analysis, the survey provides an additional point of comparison for understanding how legitimacy issues are expressed from the perspective of local residents. It was therefore treated as complementary empirical material rather than as a separate case.

To ensure anonymity, all interviewees were anonymized in the thesis. Project-level interviews were coded as Participants 1 to 10 according to the ten case-study projects analysed, while the complementary expert interview on project sourcing was coded as Participant 11. The names of projects were retained because they are analytically relevant to the case-study logic, but individual respondents are not identified by name in the thesis. Anonymity in this study therefore applies to respondents rather than to projects. This anonymization strategy preserves the project-based structure of the analysis while protecting the identity of interviewees.

The ten project-level cases were coded as follows: Participant 1 corresponds to Anthisnes, Participant 2 to Les Bons Villers, Participant 3 to Limoy, Participant 4 to Fleurus, Participant 5 to Maisières, Participant 6 to Virton, Participant 7 to Fontilloi, Participant 8 to Péronnes, Participant 9 to Momignies, and Participant 10 to Calcaire de Florennes. Participant 11 refers to the complementary expert interview on project sourcing and early-stage screening. Interviews were conducted between 13 and 20 April 2026. An overview of participants, projects, roles, interview dates, and data types is provided in Appendix C (p.80).

The empirical field of this research is entirely situated in Wallonia, Belgium. All interviews and project cases examined in this study are linked to the Walloon institutional, regulatory, and energy context. This is particularly relevant given the specific characteristics of renewable energy development in Wallonia, including administrative permitting procedures, stakeholder dynamics, agricultural land regulations, and increasing grid saturation constraints. Consequently, the findings of this research should primarily be interpreted within the Walloon context. This also constitutes a limitation of the study, as the results may not be fully generalisable to the Flemish or Brussels regions, which operate under different regulatory and energy governance frameworks.

The unit of analysis in this research is the project itself. Each case is treated as a land-specific development configuration in which technical, economic, regulatory, and stakeholder-related factors interact over time. This is important because the thesis does not seek to analyse actors in the abstract, but to understand how project feasibility is produced through the interaction of multiple constraints and opportunities in a specific development setting. The project level is therefore the most appropriate unit of analysis for answering the research question.

The analytical strategy is based on thematic cross-case comparison. The analytical categories used in the empirical chapter were derived abductively, that is, through an iterative movement between the literature review and the empirical material. On the one hand, the conceptual framework developed in Section 2.6 provided an initial set of theoretically grounded dimensions, namely land type, legitimacy dynamics, instability conditions, and project feasibility. On the other hand, the interview material made it possible to refine these dimensions and to identify how they appeared concretely across cases. In practice, the analysis focused on five core dimensions: land type, stakeholder dynamics, grid connection, project-level feasibility constraints, and economic trade-offs. These dimensions correspond directly to the main mechanisms identified in the theoretical part of the thesis.

The analysis proceeded in several stages. First, each project case questionnaire was read individually in order to reconstruct the development logic of the project, identify the principal tensions encountered, and clarify the current or final project outcome. This first stage made it possible to build an internally coherent understanding of each case before moving to comparison. Second, the cases were coded comparatively according to the five analytical dimensions mentioned above. For each project, particular attention was paid to the type of land involved, the dominant legitimacy issues, the main stakeholders and their influence, the role of grid access, the principal economic implications, and the project trajectory. Third, the cases were compared across these dimensions in order to identify recurring patterns, contrasts, and land-specific configurations. This cross-case step was central because it enabled the analysis to move from individual project stories to broader explanatory mechanisms. More specifically, it allowed the thesis to examine whether certain types of land were associated with recurring forms of legitimacy pressure, whether stakeholder influence operated through similar mechanisms across cases, and whether grid access emerged consistently as a decisive bottleneck.

The coding process was thematic rather than software driven. It consisted of identifying recurring patterns and mechanisms across the interviews and organizing them into thematic analytical dimensions aligned with the conceptual framework. A formal coding software package was not used. Instead, the project case questionnaires themselves functioned as a structured coding base. This choice is consistent with the size of the dataset and with the analytical objective of systematic case comparison rather than micro-level discourse analysis. To strengthen rigor, the same analytical grid was applied to all ten cases, and case interpretation was guided by the conceptual framework rather than by ad hoc impression. The thematic categories were therefore not invented case by case but applied consistently across the dataset. This helped reduce the risk of purely intuitive interpretation and ensured that all cases were read through the same core dimensions.

The logic of the empirical analysis is therefore best described as pattern matching between theory-derived dimensions and observed case configurations. The conceptual framework suggested that land type should shape legitimacy dynamics and investability conditions, and that project feasibility should depend on the interaction between these dimensions. The empirical analysis then examined whether this interaction could be observed across the ten cases and how it differed depending on land category and project model. In this sense, the cross-case analysis was not merely descriptive. It was designed to identify mechanisms linking land type, legitimacy pressure, infrastructural constraints, and economic outcomes.

This methodological approach has several strengths. First, it is well suited to exploring a phenomenon that is both under-theorized and strongly context dependent. Second, it makes it possible to link directly the conceptual framework developed in the literature review with the empirical analysis. Third, the combination of multiple cases allows the thesis to go beyond single-project description and identify broader patterns across land types and project trajectories. Fourth, the inclusion of both successful and unsuccessful projects strengthens the explanatory value of the study by making it possible to analyse not only what enables project realization, but also what prevents it. Finally, the inclusion of an expert sourcing interview and complementary stakeholder material strengthens the empirical design by capturing both the formal development stage and the earlier filtering logic through which opportunities are selected or abandoned.

At the same time, the methodology also has limitations. The most important is that the empirical material is based mainly on project participant perspectives and therefore reflects the interpretation of actors directly involved in project development more strongly than those of all stakeholder groups. Although this limitation is partly reduced through the inclusion of a citizen survey and an expert interview, the study does not provide a fully symmetrical stakeholder analysis. In addition, the number of cases remains limited and concentrated in a specific regional context, which means that the findings are analytically rather than statistically generalizable. They should therefore be understood as theoretically informative rather than representative of all solar PV projects on underutilized land.

A further limitation concerns the researcher's position in relation to the field. Access to the cases was facilitated by the broader internship context in which the thesis was developed. This provided a significant advantage in terms of access to internal project information and practical understanding of development processes. At the same time, such proximity to the field may create a risk of interpretive bias, especially if project participant perspectives become overrepresented in the analysis. To limit this risk, the study relies on a standardized case structure, maintains a clear project-level unit of analysis, and systematically interprets the empirical material through concepts derived from the literature review rather than through practitioner categories alone. The inclusion of contrasting cases, including blocked and refused projects, also helps reduce the risk of presenting an overly success-oriented interpretation of development.

Finally, some project information remains commercially and strategically sensitive, which limits the level of detail that can be disclosed in certain cases. This affects neither the overall analytical logic of the thesis nor the validity of the main patterns identified, but it does mean that some project-level details could not be reported exhaustively.

Despite these limitations, the chosen methodology is appropriate for the objectives of the thesis. It provides a sufficiently rich empirical basis to analyse how economic opportunities and trade-offs emerge in practice, while remaining closely aligned with the conceptual framework developed in the literature review. The methodological goal is therefore not only to document project experiences, but to explain how land type, stakeholder dynamics, infrastructural constraints, and business model choices interact to shape the feasibility of solar PV on underutilized land.

4 Analysis

4.1 Cross-case analysis of solar PV projects on underutilized land

This empirical analysis examines how the ten project cases translate the conceptual framework into concrete development trajectories. Rather than treating project outcomes as the result of a single factor, the analysis compares how land type, stakeholder dynamics, grid connection, and business model choices interact to shape whether projects become operational, delayed, redesigned, blocked, or refused. The cases show that different categories of underutilized land generate distinct combinations of legitimacy pressure, infrastructural constraint, and economic trade-off, which together determine how project feasibility is constructed in practice.

Across the ten cases, three recurring cross-case patterns emerge particularly clearly. First, land type operates as a structuring variable of feasibility. Agricultural and agrivoltaic projects tend to face stronger legitimacy and regulatory-recognition issues, whereas projects on polluted, remediated, or otherwise degraded land more often face technical and infrastructural bottlenecks. Second, stakeholder dynamics rarely determine project outcomes through direct opposition alone. Their economic significance lies more often in the indirect effects they produce, especially delay, redesign, coordination costs, and uncertainty. Third, grid access has become one of the most decisive constraints across the cases. In several projects, it outweighed the advantages associated with underutilized land and transformed potentially attractive projects into economically fragile or blocked investments (Participants 1–10, 13–20 April 2026; Participant 11, 20 April 2026).

These patterns indicate that underutilized land should not be treated as a uniform development category. The empirical material suggests instead that different land types generate different configurations of legitimacy pressure, technical feasibility, and investment risk. In this sense, project feasibility is not simply a function of whether land is available or whether stakeholders are broadly supportive. It depends on whether developers are able to align land-specific legitimacy, stakeholder expectations, infrastructural conditions, and economic logic within a viable project configuration. The purpose of the cross-case analysis is therefore not merely to compare projects descriptively, but to identify the mechanisms through which these configurations shape different project outcomes.

To support this comparison, Table 1 summarizes the main empirical characteristics of the ten projects included in the analysis. More specifically, it presents each case according to the type of land concerned, the stakeholder context surrounding the project, the dominant constraint encountered during development, the relative importance of grid-related constraints, the main feasibility effect generated by these constraints, and the resulting project outcome. The table does not replace the qualitative analysis that follows but provides a synthetic view of the main contrasts and feasibility configurations observed across the cases.

Table 1. Cross-case comparison of solar PV projects on underutilized land

Project	Land type	Stakeholder context	Dominant constraint	Grid constraint	Main feasibility effect	Project outcome
Anthisnes	Agricultural land, agrivoltaics	Medium to low	Political and institutional legitimacy	Low	Project remained technically viable, but political uncertainty undermined feasibility	Refused
Les Bons Villers	Agricultural land, agrivoltaics	Medium	Administrative and regulatory complexity	Low	Design adaptations increased capital expenditure and weakened economic optimization	Authorized in first instance
Limoy	Degraded / treated industrial site	High	Technical complexity and external coordination	High	Additional technical works and delays increased development costs and blocked implementation	Authorized but blocked before construction
Fleurus	Low-quality agricultural land in extraction dependency zone	High	Environmental integration	Moderate	Design optimization allowed the project to remain viable under environmental constraints	Operational
Maisières	Backfilled / anthropized site	Medium	Environmental obligations and biodiversity integration	Limited	Environmental integration requirements constrained design but supported project legitimacy	Under construction
Virton	Agricultural land and pastures, agrivoltaics	Medium	Stakeholder coordination and grid cost	High	Redesign, longer timelines, and expensive connection reduced project attractiveness	Under development
Fontilloi	Polluted land with backfilled section	High	Grid connection	Very high	Connection costs and delays blocked an otherwise attractive project	Suspended
Péronnes	Remediated former landfill / polluted site	High	Grid connection	Very high	Connection costs made the project economically unviable at this stage	Authorized but on hold
Momignies	Agricultural pasture, agrivoltaics	High	Industrial partner decision-making	Low	Delay affected project timing more than intrinsic viability	Permit submission delayed
Calcaire de Florennes	Agricultural land	Medium	Agricultural and regulatory legitimacy	Low	Self-consumption strengthened viability despite permit-related constraints	Operational

Source: Author's own elaboration based on project case interviews conducted between 13 and 20 April 2026.

Two main insights emerge from Table 1. First, the cases confirm that agricultural and agrivoltaic projects are more exposed to legitimacy and regulatory uncertainty, whereas degraded land projects more often face technical and grid-related bottlenecks. Second, adverse project outcomes are rarely explained by stakeholder opposition alone. In most cases, project trajectories are shaped instead by the interaction between stakeholder context, institutional support, technical feasibility, and infrastructure conditions. Projects that are broadly supported or relatively easy to permit may still remain blocked if grid connection costs are too high, while technically viable agricultural projects may fail when their legitimacy as a land use remains politically or administratively contested. Table 1 therefore provides a first empirical validation of the central argument of this thesis: the economic opportunities associated with solar PV on underutilized land can only be understood through the interaction between land-specific legitimacy, stakeholder dynamics, and broader investability conditions.

The following subsections develop this argument in greater detail. Section 4.2 examines land type as a structuring variable of project feasibility. Section 4.3 analyses stakeholder dynamics as a source of delay, redesign, and legitimacy pressure. Section 4.4 focuses on grid connection as the dominant economic bottleneck across several cases. Section 4.5 then synthesizes the main economic trade-offs that emerge from the interaction between these dimensions.

4.2 Land type as a structuring variable of project feasibility

A first major finding of the empirical analysis is that underutilized land cannot be treated as a homogeneous category. Across the ten cases, land type consistently shapes the configuration of opportunities and constraints by influencing what kind of legitimacy issues emerge, which stakeholders become central, what technical conditions matter most, and how feasibility risks are distributed over the course of development. In this sense, land type does not function as a descriptive background variable. It operates as a structuring condition that affects the entire development process.

A first cross-case pattern concerns agricultural land and pasture-based projects, particularly in agrivoltaic configurations. In these cases, the dominant feasibility challenge is not usually the physical possibility of installing solar PV, but the ability to justify the project as a legitimate continuation of agricultural land use. This pattern is visible across Anthisnes, Virton, Momignies, and Calcaire de Florennes. What these cases have in common is that the decisive issue lies in the recognition of the project's land-use logic rather than in the simple availability

of land. In Calcaire de Florennes, for example, the project was operationally viable and benefited from a self-consumption logic, yet one respondent explicitly identified “the agricultural character of the project” as the main blocking point (Participant 10, 20 April 2026). Similarly, in Anthisnes, the project was not primarily weakened by technical infeasibility or grid constraints, but by institutional ambiguity and the lack of political support surrounding agrivoltaics. As one respondent explained, the decisive issue was “the lack of political support and clarity around agrivoltaics” (Participant 1, 13 April 2026). These cases therefore suggest a recurring mechanism: on agricultural land, project feasibility depends heavily on whether solar development can be institutionally and politically recognized as a legitimate land-use compromise.

A second cross-case pattern concerns polluted, remediated, or otherwise degraded sites, such as Fontilloi, Péronnes, and Limoy. In these projects, the legitimacy profile is different. Because the land is already constrained, degraded, or no longer suited to conventional productive use, the project benefits from a more straightforward narrative of land revalorization. Compared with agricultural projects, the burden of legitimacy is lower because the project does not directly compete with productive farmland in the same symbolic or political way. However, this legitimacy advantage is systematically offset by a different constraint profile. In these cases, the decisive issues shift toward technical uncertainty, remediation dependency, soil or terrain complexity, and especially infrastructural bottlenecks. One respondent described this clearly in the case of Fontilloi, noting that the project was “intrinsically profitable,” but that the investment was blocked by “the cost of the grid connection” (Participant 7, 17 April 2026). The mechanism at work here is therefore different from that observed on agricultural land: degraded land reduces some legitimacy constraints but exposes projects more strongly to technical and grid-related feasibility risks.

A third configuration appears in hybrid or environmentally conditioned sites, such as Maisières and, to some extent, Fleurus. These projects are neither mainly constrained by agricultural legitimacy nor by acute local conflict. Instead, their feasibility depends on the degree to which energy production can be integrated into a broader ecological or environmental rationale. In these cases, project development is shaped by biodiversity requirements, site-integration conditions, or environmental obligations that influence both design and justification. The key mechanism is therefore one of environmental compatibility rather than land-use recognition alone. These cases show that some projects on underutilized land do not fit the simple

opposition between legitimacy-constrained agricultural sites and infrastructure-constrained degraded sites. Rather, they illustrate a third feasibility configuration in which environmental coherence becomes central.

Taken together, the cases reveal that land type structures project feasibility through at least three recurring mechanisms. On agricultural land, the dominant challenge is legitimacy and regulatory recognition. On degraded land, the dominant challenge is technical and infrastructural feasibility. On environmentally conditioned sites, the dominant challenge is ecological integration. This explains why underutilized land cannot be analysed as a single category of opportunity. Different land types do not simply host the same project under different conditions. They generate different feasibility configurations, and these configurations shape which trade-offs developers must absorb in order to keep the project viable.

4.3 Stakeholder dynamics as a source of delay, redesign, and legitimacy pressure

A second major finding of the empirical analysis is that stakeholder dynamics matter significantly for project development, but not in a simple or binary way. Across the cases, stakeholder influence does not appear mainly through direct opposition leading mechanically to success or failure. Instead, the cases show that stakeholder dynamics become economically consequential through indirect mechanisms, especially delay, redesign, coordination costs, legitimacy pressure, and uncertainty. This means that stakeholder acceptance should not be interpreted as a separate social variable added on top of feasibility. It should be understood as one of the channels through which feasibility itself is shaped.

A first recurring pattern is that local opposition exists but is rarely the sole explanation for project failure. In several cases, local stakeholders matter not because they fully reject the project, but because their concerns trigger a process of adaptation that reshapes the project's economic and strategic profile. Virton illustrates this mechanism particularly clearly. Although nearby residents were identified as difficult stakeholders, the project was not blocked by generalized hostility. Rather, the development process became more demanding because the project team deliberately broadened participation, notably through a citizen survey and public meeting. One respondent explained that one of the most important factors affecting progress was "the decision to involve significantly more stakeholders than usual" (Participant 6, 15 April 2026). The result was not direct rejection, but a more complex development trajectory involving additional consultation, design modification, and relocation of the technical area. The

mechanism here is therefore procedural: broader stakeholder integration increases legitimacy, but at the cost of additional time, coordination, and design constraints.

A similar logic appears in Les Bons Villers. There too, stakeholder integration did not translate into outright conflict, but into an iterative process of adjustment. The project remained feasible, yet its design and management became more complex because legitimacy had to be maintained through adaptation. What matters in both cases is that stakeholder dynamics do not operate simply as a yes-or-no filter. They influence feasibility by altering the conditions under which the project can remain acceptable and therefore viable.

A second recurring pattern concerns the role of institutional and strategic stakeholders. Across the cases, the most decisive stakeholder pressures are not always local. In several projects, actors such as municipalities, regulatory bodies, or industrial partners exert stronger influence than nearby residents because they possess greater leverage over authorization, recognition, or implementation. In Anthisnes, the central difficulty came from the reversal of municipal support and the lack of political clarity around agrivoltaics. In Calcaire de Florennes, the decisive issue was the position of regulatory actors questioning the agricultural legitimacy of the project. In Momignies, the main source of delay came from the internal approval process of the industrial partner rather than from public resistance. One respondent emphasized that the project was delayed because of “the time required to obtain internal management approval” from the glassworks (Participant 9, 17 April 2026). The mechanism here is one of stakeholder leverage: some actors matter more than others because they control critical decision points.

This interpretation is reinforced by the expert interview on project sourcing. From the perspective of early-stage screening, stakeholder-related risk is already anticipated before a project formally enters development. The respondent explained that sites located too close to residential areas are often abandoned very early and referred to situations in which local committees or petitions made projects unattractive from the outset (Participant 11, 20 April 2026). This shows that stakeholder dynamics influence not only realized project development, but also pre-development opportunity selection. In other words, stakeholder pressure can act both as a development constraint and as an ex-ante filtering mechanism.

Taken together, the cases indicate that stakeholder dynamics affect project feasibility through three main mechanisms. First, they generate procedural and coordination costs when legitimacy

must be built through consultation and adaptation. Second, they create delay and uncertainty when influential institutional or strategic actors control key decisions. Third, they shape opportunity selection even before formal development begins when certain stakeholder risks are anticipated as too costly. This means that stakeholder dynamics are analytically important not because they always cause visible conflict, but because they reshape the economic and temporal conditions under which projects remain feasible.

4.4 Grid connection as the dominant economic bottleneck

A third and particularly strong finding of the empirical analysis concerns the role of grid connection. Across the ten cases, grid access emerges as one of the most decisive economic bottlenecks and, in several projects, outweighs land availability, stakeholder acceptance, and permitting conditions. More importantly, the cases show that grid connection does not operate as a neutral technical issue. It acts as a mechanism that converts otherwise attractive opportunities into economically fragile, delayed, or blocked projects.

The clearest pattern appears in projects developed on polluted or remediated land, especially Fontilloi and Péronnes. In both cases, the initial development logic was favorable. The sites offered strong land-use legitimacy, positive narratives of revalorization, and relatively limited opposition compared with agricultural projects. Yet these advantages did not translate into implementation. Once the grid connection conditions became known, the projects became economically unviable or were suspended. In Fontilloi, one respondent explained that the project was “intrinsically profitable,” but that the investment could not proceed because of “the cost of the grid connection” (Participant 7, 17 April 2026). In Péronnes, the decisive issue was similarly that the connection offer was financially untenable (Participant 8, 17 April 2026). The mechanism is therefore clear: grid connection transforms theoretical attractiveness into practical feasibility only when its cost and timing remain absorbable.

A second pattern appears in cases where grid constraints interact with other feasibility issues rather than acting alone. Limoy and Virton illustrate this mechanism. In Limoy, the project benefited from the legitimacy of a degraded site and from the absence of major local conflict, but development remained blocked by the combination of technical site issues, SPAQuE¹¹ dependency, and connection delays. One respondent emphasized that the project was “mainly

¹¹ SPAQuE (Société Publique d’Aide à la Qualité de l’Environnement) is a Walloon public agency responsible for the remediation, management, and monitoring of polluted land and former industrial sites.

blocked today by waiting for the ORES¹² connection and the completion of SPAQuE's works" (Participant 3, 13 April 2026). In Virton, grid constraints were not the only issue, but they amplified the economic consequences of stakeholder coordination and design adaptation. One respondent noted that the connection offer was "much more expensive than expected" and that accommodating the project would require replacing existing cables (Participant 6, 15 April 2026). These cases show that grid constraints often operate cumulatively: they do not simply add one more difficulty but intensify the weight of already existing uncertainties.

A third pattern is that grid access increasingly acts as an ex-ante filter of opportunity. The expert interview confirms that grid availability is taken into account very early, sometimes before a site is seriously pursued. The respondent explained that grid availability is "one of the first analyses" conducted when assessing a site and identified "no grid access" as one of the main red flags that can rapidly discourage development (Participant 11, 20 April 2026). This means that grid conditions shape not only project implementation, but also the set of projects that ever reach development. In this sense, grid connection is both a bottleneck within projects and a selection mechanism between projects.

At the same time, the cases also show that grid dependence is not uniform across business models. Projects linked to self-consumption or local valorisation, such as Calcaire de Florennes and Momignies, appear more resilient because their viability is less dependent on conventional network export. These projects do not eliminate infrastructure concerns entirely, but they reduce exposure to the most prohibitive effects of network saturation. The mechanism here is one of partial insulation: business model design can reduce the economic weight of grid constraints, even if it creates new dependencies elsewhere.

Taken together, the cases suggest that grid connection shapes project feasibility through three mechanisms. It can directly undermine investability by imposing prohibitive costs or delays. It can amplify the economic consequences of other project constraints. And it can filter opportunities upstream by excluding sites that appear unattractive under current network conditions. This explains why grid access emerges not as a secondary technical variable, but as one of the central determinants of solar PV feasibility on underutilized land in the Walloon context.

¹² ORES is one of the main electricity and gas distribution system operators (DSOs) in Wallonia, responsible for local grid management and connection infrastructure.

4.5 Economic trade-offs across the cases

Taken together, the cases show that solar PV development on underutilized land is structured by recurring economic trade-offs, but that the content of those trade-offs varies depending on land type, stakeholder configuration, infrastructure conditions, and project model. The central empirical insight is that project feasibility depends less on any single favourable condition than on the ability to align multiple dimensions at once. Projects tend to stall, be redesigned, or fail when legitimacy, technical feasibility, and economic logic can no longer be aligned within an acceptable cost structure.

A first recurring trade-off appears in agrivoltaic projects developed on agricultural land. In these cases, the central tension lies between agricultural credibility and economic optimization. Projects such as Les Bons Villers and Virton show that improving legitimacy often requires design adaptations that reduce economic performance. In Les Bons Villers, the project had to be adapted to agricultural use through higher structures and repeated modifications, which reduced installed capacity and increased capital expenditure. In Virton, environmental, agricultural, and local acceptance considerations similarly led to substantial adjustments, including the relocation of the technical area in response to residents' concerns (Participant 2, 13 April 2026; Participant 6, 15 April 2026). The mechanism at work here is straightforward: legitimacy-enhancing adaptations increase acceptability, but they also raise costs, prolong development, or reduce output. The trade-off is therefore not between legitimacy and feasibility in the abstract, but between making the project more defensible and making it more economically efficient.

A second recurring trade-off concerns projects on degraded or remediated land. In these cases, the main tension lies between easier land-use legitimacy and higher hidden technical or infrastructural costs. Fontilloi and Péronnes illustrate this particularly clearly. Both projects benefited from a strong revalorization narrative and reduced competition with agricultural land, which made them socially and politically attractive. Yet these advantages were offset by the prohibitive cost of connection. One respondent explicitly described Fontilloi as “intrinsically profitable,” while also stressing that the project could not proceed because of “the cost of the grid connection” (Participant 7, 17 April 2026). The mechanism here is one of displaced constraint: the project gains legitimacy on the land-use dimension but loses feasibility on the infrastructural dimension.

A third recurring trade-off appears in projects based on self-consumption or territorially embedded electricity use. In Momignies and Calcaire de Florennes, linking production to local demand improved the business case and reduced dependence on conventional export conditions. However, this increased viability came at the cost of new relational dependencies. In Momignies, the project was delayed not because of technical infeasibility or local contestation, but because internal approval from the industrial partner was required (Participant 9, 17 April 2026). The mechanism here is not infrastructural but organizational: business model innovation can strengthen viability while simultaneously increasing exposure to partner-related strategic risk.

A fourth trade-off concerns environmentally integrated projects such as Fleurus and Maisières. In these cases, environmental obligations and biodiversity integration impose constraints on layout, design, or implementation, but they also contribute to a stronger legitimacy narrative. The key tension is therefore between compliance as a constraint and ecological integration as a source of value. These projects suggest that environmental requirements do not necessarily weaken feasibility in a simple way. Under certain site conditions, they can also support a more credible and territorially coherent project rationale.

Across all four configurations, the same broader mechanism remains visible. Feasibility depends on whether developers are able to convert one source of project value into another without allowing the associated cost to become prohibitive. A project may gain legitimacy but lose efficiency. It may gain land-use justification but lose bankability. It may reduce grid dependence but increase organizational dependence. It may improve ecological coherence but constrain design flexibility. The cases therefore show that the most decisive trade-offs are not purely technical or purely financial. They are configurational. They arise from the way different forms of value and constraint interact within a given project.

Overall, the empirical analysis shows that solar PV development on underutilized land involves a constant process of arbitration between value creation and value erosion. Underutilized land creates opportunities because it can reduce direct land-use conflict, support site revalorization, enable multifunctional uses, and open room for innovative business models. At the same time, these opportunities are repeatedly offset by trade-offs linked to legitimacy, redesign, stakeholder coordination, grid access, and financing conditions. The economic opportunities

associated with such land can therefore only be understood together with the trade-offs required to realize them. This confirms the central argument of the thesis: the feasibility of solar PV on underutilized land is not given by the land itself but is produced through a land-specific configuration of legitimacy, infrastructure, economic conditions, and strategic adjustment.

To synthesize the cross-case analysis more explicitly, Table 2 identifies the main feasibility configurations observed across the cases. Rather than presenting projects individually, it groups them according to the dominant combination of legitimacy pressures, investability conditions, and mechanisms affecting project feasibility. The purpose of this table is to move from case comparison to analytical abstraction by showing how different land contexts generate recurring patterns of constraint and opportunity.

Table 2. Main feasibility configurations across land types

Feasibility configuration	Typical land context	Dominant legitimacy issue	Dominant investability issue	Main mechanism affecting feasibility	Typical project implication
Agricultural-legitimacy constrained	Agricultural land / pastures / agrivoltaics	Recognition of land-use legitimacy; political and regulatory ambiguity	Higher adaptation costs; possible reduction in output or efficiency	Legitimacy must be secured through redesign, justification, and institutional recognition	Projects remain feasible only if legitimacy-enhancing adaptations stay economically absorbable
Degraded land infrastructure constrained	Brownfields / polluted sites / remediated sites / former landfills	Generally easier land-use justification	Grid connection cost, remediation dependency, technical complexity	Legitimacy advantage is offset by infrastructural and technical bottlenecks	Projects may be socially acceptable yet economically blocked
Environmentally conditioned integration	Anthropized / hybrid / ecologically sensitive sites	Need for environmental coherence and biodiversity compatibility	Design constraints and additional integration requirements	Ecological obligations reshape project design and justification	Feasibility depends on whether environmental integration can be turned into project value
Locally valorized electricity model	Sites linked to self-consumption or nearby industrial demand	Need to maintain legitimacy with partner and territory	Dependence on off-taker decisions and local organizational alignment	Reduced exposure to grid saturation, but increased relational dependence	Projects may become more resilient economically, while remaining vulnerable to partner-related delay

Source: Author's own elaboration based on project case interviews conducted between 13 and 20 April 2026.

Table 2 shows that underutilized land does not define a single project category, but a set of distinct feasibility configurations. What differs across these configurations is not only the type of land involved, but also the mechanism through which feasibility is weakened or sustained. This reinforces the central argument of the empirical analysis: project success or failure depends less on land status alone than on the specific combination of legitimacy dynamics, infrastructural conditions, and economic adjustments associated with each land context.

5 Discussion

This discussion interprets the empirical findings considering the literature review and clarifies the theoretical contribution of the thesis to the study of solar PV development on underutilized land. The analysis showed that project outcomes are not determined by land type alone, stakeholder acceptance alone, or technical feasibility alone. Instead, the cases indicate that solar PV development on underutilized land is shaped by the interaction between land-specific legitimacy, stakeholder dynamics, and broader investability conditions, especially grid access and the economic conditions attached to connection. In that respect, the findings support the central argument developed in the literature review, namely that the viability of solar PV projects must be understood as the outcome of an interaction between social legitimacy and investability rather than through either dimension in isolation.

A first contribution of the empirical analysis is that it refines the literature on social acceptance by showing that land type is not merely a descriptive feature of projects, but a structuring variable that shapes the nature of the feasibility trade-offs involved. This is consistent with Carlisle et al. (2016), who argue that stakeholders evaluate solar projects in relation to the specific type of landscape and land use being transformed, and with Wüstenhagen et al. (2007), who distinguish between general support for renewables and project-level acceptance. However, the empirical findings go further by showing that land type does not only affect stakeholder perception. It also reshapes the configuration of feasibility problems that becomes decisive during development. Agricultural and agrivoltaic projects are more exposed to legitimacy, recognition, and regulatory ambiguity, whereas polluted or degraded sites are more exposed to technical and infrastructural constraints. Land type therefore structures not only how projects are perceived, but also how project risk is distributed across institutional, technical, and economic dimensions.

This point is particularly visible in the contrast between agrivoltaic projects and brownfield or landfill-like projects. The literature suggests that agrivoltaics can improve acceptance by reducing the impression that solar development displaces agricultural use (Zeddies et al., 2025). The empirical material broadly supports this intuition but also shows its limits. In several agricultural cases, including Anthisnes, Virton, and Calcaire de Florennes, the central issue was not whether agrivoltaics could in principle create a more legitimate land-use compromise, but whether institutions were willing to recognize it as such. This indicates that legitimacy is not

only a matter of local stakeholder perception, but also of institutional recognition. The findings therefore extend the literature by showing that acceptance-enhancing designs do not automatically reduce project risk if their status remains politically or administratively uncertain. The findings on polluted and remediated land similarly refine the literature on brownfield redevelopment. McCarthy (2002) argues that brownfields may appear attractive because they avoid direct competition with other valued land uses, while also involving specific redevelopment constraints. The empirical evidence strongly confirms this duality. In Fontilloi, Péronnes, and Limoy, degraded land did provide a more straightforward legitimacy narrative and a stronger justification in terms of land reuse. Yet this did not make these projects easier overall. Instead, the legitimacy advantage of such sites was offset by technical uncertainty, dependencies on actors such as SPAQuE, and especially severe grid-related constraints. The findings therefore sharpen the literature's broader intuition by showing that, in the present Walloon context, the decisive bottleneck on degraded land is often not land-use legitimacy, but the economic ability to connect the project to the electricity system.

A second contribution concerns the interpretation of stakeholder dynamics. The literature on social acceptance, stakeholder utility functions, and energy justice suggests that project outcomes depend on how stakeholders perceive burdens, benefits, fairness, and recognition (Wüstenhagen et al., 2007; Harrison et al., 2010; Heffron & McCauley, 2017). The empirical findings broadly confirm this view, but they also show more precisely how stakeholder dynamics become economically consequential. Across the cases, stakeholder influence operated less through direct opposition than through processual mechanisms such as delay, redesign, coordination costs, negotiation, and conditional legitimacy. This refines a common reading of the acceptance literature in which project failure is primarily associated with visible local resistance. In the cases analysed here, stakeholder dynamics became decisive when they required developers to absorb additional time, redesign, or uncertainty in relation to key institutional or strategic actors.

This interpretation is consistent with Froeman's (1999) argument that stakeholder influence matters when actors possess the capacity to affect project outcomes through control over relevant relationships and resources. The empirical material illustrates this clearly. In some cases, nearby residents mattered because they could generate political or reputational pressure. In others, administrative actors mattered because they could shape the regulatory interpretation of the project. In still others, industrial partners mattered because their agreement was necessary

to sustain the business model itself. The findings therefore support stakeholder theory but shift the emphasis away from a simple supportive-versus-opposed distinction. What matters is not only what stakeholders think, but how much leverage they have, at what stage they intervene, and whether their influence requires costly project adaptation.

The discussion also refines the relevance of energy justice. Heffron and McCauley (2017) argue that legitimacy depends on distributional, procedural, and recognition-based justice. The empirical material supports this framework, particularly in cases where project teams broadened consultation or modified project design in response to local concerns. At the same time, the cases show more explicitly how justice enters the economic logic of project development. Procedural openness, recognition of local concerns, and attempts to create a more acceptable project design can improve legitimacy, but they also generate coordination costs, delays, and lower technical optimization in some cases. The findings therefore confirm the literature's emphasis on fairness while also showing that fairness is not external to project economics. It is one of the mechanisms through which project economics are shaped.

A third and particularly important contribution concerns the relationship between local legitimacy and investability. The literature review identified a gap between the acceptance literature, which explains why conflict emerges, and the investment literature, which explains how uncertainty, policy credibility, and financing conditions shape renewable energy deployment (Boomsma et al., 2012; Rogge & Reichardt, 2016; Neuhoff et al., 2022; Rydehell et al., 2024). The empirical findings address this gap directly. Across the cases, local legitimacy and investment feasibility are not separate dimensions that can be analysed independently. They interact continuously. Stakeholder demands become economically decisive when they require redesign, delay, or more complex project arrangements under already constrained feasibility conditions. Conversely, infrastructural and financing constraints become more severe when the project must also absorb legitimacy-related costs.

This interaction is most visible in the role of grid connection. In several cases, grid access outweighed many of the advantages associated with underutilized land. Fontilloi and Péronnes are the clearest examples. Both projects benefited from a strong land-use rationale, relatively positive acceptance conditions, and a convincing narrative of land revalorization. Yet both became blocked because the cost and timing of connection made them economically untenable. This confirms the investment literature's broader argument that project feasibility depends not

only on technical opportunity, but also on the cost structure and credibility of the wider investment environment (Boomsma et al., 2012; Neuhoﬀ et al., 2022). At the same time, the findings add an important land-specific dimension: connection risk does not operate as a purely general market condition but becomes decisive in different ways depending on land type, project configuration, and the possibility of local electricity valorisation.

In that respect, Calcaire de Florennes and Momignies are particularly revealing. These projects suggest that self-consumption or territorially embedded business models can partly reduce exposure to network saturation and thereby strengthen project viability. This is consistent with the literature on business model innovation in the energy sector (Richter, 2013; Teece, 2010). However, the cases also show that such models do not eliminate trade-offs. They create new dependencies on industrial partners, organizational decision-making, and local demand configurations. The contribution of the thesis is therefore not to present self-consumption as a universal solution, but to show that business model design is becoming increasingly central in determining which underutilized-land projects remain investable under present infrastructure constraints.

Taken together, these findings allow the thesis to make a more explicit theoretical contribution. This thesis contributes to the literature by conceptualising underutilized land not as a homogeneous category of alternative siting, but as a set of land-specific opportunity structures in which legitimacy and investability are jointly configured. More specifically, the thesis shows, first, that land type moderates which feasibility constraint becomes decisive; second, that stakeholder dynamics affect project viability primarily through indirect economic mechanisms rather than direct opposition alone; and third, that grid access acts as a critical mediating condition through which locally legitimate projects may nevertheless become economically unviable. In doing so, the thesis extends the literature by integrating social acceptance, stakeholder theory, energy justice, and renewable investment into a single empirical interpretation of project feasibility on underutilized land.

This contribution also helps clarify the central mechanism emerging from the cases. Solar PV projects on underutilized land do not succeed simply because they are placed on land that is marginal, degraded, or weakly used. They succeed when developers are able to align land-use legitimacy, stakeholder support, infrastructural feasibility, and economic viability within a coherent project configuration. Failure, delay, or redesign occur when one or more of these

dimensions cannot be reconciled with the others at an acceptable cost. The thesis therefore shifts the analytical focus away from single-factor explanations and toward configurational feasibility.

At the same time, some limitations must be acknowledged. The empirical material is based primarily on project participant perspectives and therefore reflects the interpretation of actors directly involved in development rather than a fully symmetrical stakeholder sample. This limitation is partly mitigated by the use of a citizen survey in the Virton case and by the expert interview on project sourcing, but it remains relevant in terms of the representativeness of all stakeholder viewpoints. In addition, the number of cases remains limited and concentrated in a specific regional context, which means that the findings should be interpreted as analytically generalizable rather than statistically representative. Finally, some observed patterns, especially those related to network saturation and regulatory ambiguity around agrivoltaics, are likely to be shaped by the institutional specificities of Wallonia. These limits do not weaken the analytical contribution of the study, but they do indicate that further comparative research would be useful to test how far these patterns hold in other policy and infrastructure environments.

Despite these limits, the discussion highlights three main contributions of the thesis. First, it demonstrates that land type acts as a structuring variable of feasibility rather than as a simple site descriptor. Second, it shows that stakeholder dynamics matter primarily through indirect economic mechanisms such as delay, redesign, and legitimacy pressure. Third, it establishes that the economic viability of solar PV on underutilized land depends fundamentally on the interaction between social legitimacy and investability, with grid connection emerging as a decisive mediating variable. These findings allow the thesis to move beyond a descriptive account of project difficulties and toward a more integrated explanation of when and how underutilized land can support viable solar PV development.

6 Conclusion

This thesis examined the economic opportunities and trade-offs of developing solar PV projects on underutilized land, and analysed how land type, stakeholder dynamics, and grid constraints shape project feasibility. More specifically, it investigated how pastures, polluted sites, brownfields, former landfills, and other weakly valorised areas can create value for solar development, while also generating specific tensions between legitimacy, technical feasibility, and economic performance.

The findings show that underutilized land does offer real opportunities for solar PV development, but that these opportunities are neither automatic nor uniform. Such land can create value by reducing direct competition with more contested uses, by supporting narratives of land revalorization, by enabling multifunctional project configurations, and, in some cases, by opening possibilities for self-consumption or stronger territorial anchoring. However, these opportunities are always accompanied by land-specific trade-offs. Agricultural and agrivoltaic projects are more exposed to legitimacy and regulatory uncertainty, while polluted, remediated, or landfill-like sites are more exposed to technical and infrastructural constraints. Underutilized land does not remove project tensions. It reshapes them.

The analysis also shows that stakeholder dynamics are central to project development, but not primarily because they produce direct opposition. In most cases, their influence operated through indirect mechanisms such as legitimacy pressure, design adaptation, coordination costs, and delay. Acceptance is therefore not best understood as a simple yes-or-no condition, but as part of the broader process through which project feasibility is negotiated. Municipalities, public administrations, industrial partners, environmental actors, and local residents do not influence projects in the same way, but their role becomes decisive when they are able to reshape the project, slow down decision-making, or affect the conditions under which the project remains legitimate and viable.

Most importantly, the thesis demonstrates that grid connection has become a decisive economic bottleneck. In several of the cases analysed, projects that were technically credible, relatively well accepted, and positively framed in terms of land valorisation nevertheless became blocked because of the cost, delay, or uncertainty associated with connection. This suggests that, in the current Walloon context, the feasibility of solar PV on underutilized land depends not only on

the quality of the site or the strength of the project concept, but increasingly on whether the surrounding infrastructure and business model allow the value created by the project to be realized in practice.

Taken together, these findings provide a clear answer to the research question concerning the economic opportunities and trade-offs of developing solar PV projects on underutilized land. The economic opportunities stem from the possibility of creating value from sites that are degraded, weakly used, or difficult to valorise otherwise, while in some cases also supporting local energy use, environmental integration, or multifunctional land-use arrangements. The main trade-offs arise because this value creation depends on the capacity to absorb land-specific legitimacy problems, stakeholder-related adjustments, technical constraints, and especially grid-related costs. The feasibility of such projects is therefore produced through the interaction between land type, stakeholder dynamics, infrastructural conditions, and economic viability, rather than determined by any one dimension alone.

From a theoretical perspective, the thesis contributes by conceptualising underutilized land not as a homogeneous category of alternative siting, but as a set of land-specific opportunity structures in which legitimacy and investability are jointly configured. It shows that land type reshapes which feasibility constraint becomes decisive in a given project, that stakeholder dynamics become economically relevant mainly through indirect mechanisms such as delay, redesign, and uncertainty, and that grid access acts as a critical mediating condition through which otherwise legitimate projects may become economically unviable. In doing so, the thesis integrates insights from social acceptance, stakeholder theory, energy justice, and renewable investment literature to explain how project feasibility is shaped differently across land types.

From a managerial perspective, the findings suggest that developers should treat land type as an early strategic indicator of the constraint profile a project is likely to face. Agricultural sites require particular attention to legitimacy, regulatory recognition, and the credibility of the agrivoltaic model. Polluted and remediated sites may offer easier land-use justification but require much earlier anticipation of technical constraints and grid access. More broadly, the results suggest that grid studies, stakeholder mapping, and business model design should be integrated much earlier in project development, since weaknesses in these areas can undermine otherwise attractive opportunities. This is particularly important because the cases show that some constraints become visible only after significant development effort has already been

invested. The cases also indicate that self-consumption and territorially embedded energy models may improve resilience under constrained grid conditions, although they also create new relational dependencies that must be managed carefully.

This thesis also has limitations. The empirical material is based mainly on project participant perspectives, which means that the findings reflect the interpretation of developers more strongly than those of all stakeholder groups. Although this limitation is partly reduced through the use of additional material such as a citizen survey and an expert interview on project sourcing, the study does not offer a fully symmetrical stakeholder analysis. In addition, the number of cases remains limited and concentrated in a specific regional context. The findings should therefore be interpreted as analytically robust but not statistically representative. Finally, some of the observed trade-offs, especially those related to grid saturation and regulatory ambiguity around agrivoltaics, are likely to be shaped by the institutional specificities of Wallonia.

These limitations point to several avenues for future research. Comparative work across regions or countries would be useful to assess whether the land-specific feasibility patterns identified here hold in other regulatory and infrastructural environments. Further research could also deepen the stakeholder side of the analysis by examining how local communities, public authorities, or industrial off-takers themselves interpret the trade-offs associated with solar PV on underutilized land. Finally, future studies could explore more systematically the role of alternative business models, including self-consumption, energy sharing, or hybrid solar-storage configurations, in improving the feasibility of projects exposed to severe network constraints.

Overall, the central conclusion of this thesis is that underutilized land does not constitute a simple reserve of easy opportunities for solar PV development. Its value lies instead in the specific opportunity structures it creates for aligning land reuse, energy production, and territorial value. Whether those opportunities can be realized depends on the ability to negotiate land-specific trade-offs between legitimacy, stakeholder acceptance, technical feasibility, and economic viability. Solar PV on underutilized land is therefore best understood not as an inherently easier form of development, but as a form of development whose feasibility is conditional, relational, and deeply context dependent.

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8 Appendices

APPENDIX A:

Project Case Questionnaire

The following questionnaire was used as a standardized data collection instrument for all semi-structured interviews conducted in this research. It was designed to ensure consistency across cases while allowing flexibility for respondents to elaborate on project-specific dynamics.

All interviews were conducted with professionals involved in solar PV project development. The questionnaire focuses on project-level information related to site characteristics, stakeholder dynamics, development constraints, grid connection, and economic trade-offs.

Section 1 - Basic Project Information

1. Project name:
2. Location:
3. Role of respondent:
4. Type of project (e.g. ground-mounted PV, agrivoltaics, hybrid):
5. Type of land concerned (e.g. agricultural, brownfield, landfill, industrial):
6. Approximate size / capacity of the project:
7. Current status of the project (e.g. under development, delayed, authorized, blocked, operational):

Section 2 - Initial Rationale of the Project

8. What triggered the launch of this project?
9. Why was this site considered suitable or attractive at the beginning?
10. What were the main expected benefits at the start?

Section 3 - Stakeholders Involved

11. Who are the main stakeholders involved in the project?
12. Which stakeholders were the most supportive?
13. Which stakeholders were the most difficult to manage or the most constraining?
14. Were there any significant conflicts, tensions, or misalignments between stakeholders?

Section 4 - Main Constraints and Blocking Points

15. What were the main blocking points encountered during the project?
16. At what stage did these blocking points appear?
17. Which blocking point had the strongest impact on project progress?
18. Were there any unexpected constraints that had not been anticipated at the beginning?

Section 5 - Grid Connection and Network Constraints

19. To what extent did grid connection affect the project?

20. Was network saturation a major issue in this project? Why or why not?
21. Were there significant difficulties related to access to connection capacity, substations, or grid availability?
22. Which grid-related actors were involved, and how did they influence the project?
23. Did grid constraints affect the timeline, design, capacity, or overall feasibility of the project?

Section 6 - Economic and Strategic Trade-offs

24. What were the main economic trade-offs in this project?
25. Which factors most affected the project's feasibility or attractiveness?
26. Did the project require important design adaptations in order to remain viable?
27. Were there trade-offs between land use, stakeholder acceptance, technical feasibility, and profitability?

Section 7 - Outcome of the Project

28. Did the project evolve as initially expected?
29. If not, what changed during development, and why?
30. What is the current outcome of the project?
31. If the project was delayed, suspended, redesigned, or abandoned, what were the main reasons?

Section 8 - Lessons Learned

32. Looking back, what are the main lessons learned from this project?
33. What would you do differently if the project started again today?
34. In your opinion, what was the single most decisive factor in the project's success, delay, or difficulty?
35. Any additional comments or observations that you believe are important for understanding this project?

APPENDIX B: Anonymized Interview Transcripts

A. Interview Anthisnes

- **Section 1. Informations générales**

1. Nom du projet

Anthisnes

2. Localisation

Anthisnes

3. Nom / fonction de la répondante

Participant 1, cheffe de projet

4. Type de projet

Projet agrivoltaïque sur terres agricoles, pâturage et culture, destiné à devenir un projet ovin.

5. Type de terrain concerné

Terres agricoles, pâturage et culture.

6. Taille / capacité approximative du projet

La taille du projet a évolué, mais le projet se termine à environ 10 MW.

7. Statut actuel du projet

Projet refusé. Refusé en première instance puis refusé par le ministre.

- **Section 2. Logique initiale du projet**

8. Quelle était la logique initiale du projet ?

La raison initiale du projet s'inscrivait dans le cadre d'une transmission agricole entre le propriétaire du terrain, qui approche de la pension, et un jeune exploitant local.

9. Pourquoi ce site était-il considéré comme attractif au départ ?

Le site était considéré comme attrayant parce qu'il était proche du poste d'injection, qu'il s'agissait d'une plaine d'une taille suffisante, et qu'il se situait sur une terre agricole pauvre.

10. Quels étaient les principaux bénéfices attendus au départ ?

Produire de l'énergie verte proche du réseau, avec une belle intégration d'une coopérative citoyenne.

- **Section 3. Parties prenantes**

11. Qui étaient les principales parties prenantes impliquées ?

Une coopérative citoyenne, un fermier proche de la pension, un jeune fermier, la commune.

12. Quelles parties prenantes étaient les plus favorables ?

Les intervenants à la base étaient favorables au niveau de la commune.

13. Quelles parties prenantes ont été les plus contraignantes ?

La commune est devenue un acteur contraignant après une faible opposition locale. Plus largement, le manque de soutien politique à l'agrivoltaïsme au niveau régional a été très contraignant.

14. Y a-t-il eu des conflits, tensions ou décalages significatifs ?

Oui. Il y a eu un décalage entre le soutien communal initial et la position finale de la commune, qui a remis un avis négatif après une petite levée de boucliers. Il existait aussi un contexte général de peu de soutien à l'agrivoltaïsme.

- **Section 4. Contraintes et points de blocage**

15. Quels ont été les principaux points de blocage ?

Des questions liées au DNF (Nature et Forêts), l'avis négatif de la commune, et le manque de soutien politique au niveau de la Région wallonne pour ce type de projet.

16. À quel stade ces points de blocage sont-ils apparus ?

Les points liés au DNF avaient été appréhendés dès le départ, mais sont apparus plus concrètement en cours de route. L'avis négatif de la commune est intervenu au cours du développement.

17. Quel point de blocage a eu l'impact le plus fort ?

L'avis négatif de la commune, combiné au peu de soutien politique général.

18. Y a-t-il eu des contraintes inattendues ?

Des contraintes liées à la gestion des eaux existent toujours, mais elles restent techniquement gérables. La contrainte majeure a surtout été le manque de soutien politique et de clarté autour de l'agrivoltaïsme.

• Section 5. Raccordement et réseau

19. Dans quelle mesure le raccordement a-t-il affecté le projet ?

Le raccordement n'a pas constitué un problème majeur dans ce projet.

20. La saturation du réseau a-t-elle été un enjeu majeur ?

Non, il n'y a pas eu de souci particulier de saturation ou de raccordement.

21. Y a-t-il eu des difficultés significatives liées au raccordement ?

Non. Une offre de raccordement a été obtenue auprès de RESA, gestionnaire de réseau en province de Liège.

22. Quels acteurs réseau étaient impliqués et quel a été leur rôle ?

RESA était l'acteur réseau impliqué. Son intervention n'a pas posé de problème particulier.

23. Les contraintes réseau ont-elles affecté le calendrier, le design, la capacité ou la faisabilité ?

Non, les contraintes réseau n'ont pas affecté de manière significative le calendrier, le design, la capacité ou la faisabilité du projet.

• Section 6. Arbitrages économiques et stratégiques

24. Quels ont été les principaux compromis économiques ?

Laisser une partie du projet à la coopérative citoyenne et réduire la taille du projet.

25. Quels facteurs ont le plus affecté la faisabilité ou l'attractivité du projet ?

Le manque de soutien politique et l'absence de clarté autour de l'agrivoltaïsme, plus que les aspects techniques ou réseau.

26. Le projet a-t-il nécessité des adaptations de design importantes ?

Oui. Le projet a été réduit, mais même réduit, il restait rentable.

27. Y a-t-il eu des arbitrages entre usage du sol, acceptation, faisabilité technique et rentabilité ?

Oui. Il y a eu un compromis économique avec l'intégration d'une coopérative citoyenne et avec la réduction du projet. Techniquement, le projet restait faisable et rentable, mais l'acceptabilité politique et locale a constitué le principal frein.

• Section 7. Résultat du projet

28. Le projet a-t-il évolué comme prévu initialement ?

Non.

29. Si non, qu'est-ce qui a changé et pourquoi ?

Le projet n'a pas évolué comme prévu puisqu'il a été refusé malgré une logique initiale favorable et un projet techniquement faisable.

30. Quel est le résultat actuel du projet ?

Le projet est refusé.

31. Si le projet a été retardé, suspendu, redessiné ou abandonné, pourquoi ?

Principalement à cause du refus du ministre, dans un contexte plus large de manque de volonté politique et de manque de clarté sur l'agrivoltaïsme.

- **Section 8. Enseignements**

32. Quels sont les principaux enseignements tirés de ce projet ?

Obtenir par écrit un engagement communal ferme et s'assurer d'un soutien ministériel par rapport à l'agrivoltaïsme et aux projets pilotes.

33. Que ferait-elle différemment aujourd'hui ?

S'assurer d'abord d'un avis favorable de la DDR, l'administration de la ruralité qui donne les autorisations sur le projet agricole.

34. Quel a été selon elle le facteur le plus décisif ?

Le manque de volonté politique et de clarté par rapport à l'agrivoltaïsme.

35. Commentaire additionnel

Le projet semblait pertinent sur le plan technique, foncier et réseau, mais il a été fortement pénalisé par le contexte politique et institutionnel peu favorable à l'agrivoltaïsme en Wallonie.

B. Interview Les Bons Villers

• Section 1. Informations générales

1. Nom du projet

Les Bons Villers

2. Localisation

Les Bons Villers

3. Nom / fonction de la répondante

Participant 2, cheffe de projet

4. Type de projet

Projet agrivoltaïque associant élevage et maraîchage.

5. Type de terrain concerné

Terrain communal historiquement utilisé pour de la culture intensive, destiné à devenir un projet associant élevage et maraîchage.

6. Taille / capacité approximative du projet

Environ 3,5 MW répartis sur 6 hectares, dont 2 hectares de maraîchage et 4 hectares d'élevage (avec deux producteurs locaux).

7. Statut actuel du projet

Projet autorisé en première instance.

• Section 2. Logique initiale du projet

8. Quelle était la logique initiale du projet ?

Le projet s'inscrit dans un appel d'offres communal. La volonté initiale de la commune était de transformer un terrain historiquement dédié à la culture intensive en un projet considéré comme vertueux, combinant production énergétique, élevage et maraîchage.

9. Pourquoi ce site était-il considéré comme attractif au départ ?

C'était un terrain communal porté politiquement par la commune, avec une vision claire de projet vertueux. Deux producteurs locaux avaient été identifiés en amont et ont suivi dans le développement.

10. Quels étaient les principaux bénéfices attendus au départ ?

Développer un projet combinant énergie renouvelable, élevage et maraîchage, avec une forte cohérence locale et territoriale.

• Section 3. Parties prenantes

11. Qui étaient les principales parties prenantes impliquées ?

La commune, les riverains, PlantC, une ASBL impliquée dans la définition des écrans végétaux, et les producteurs locaux identifiés en amont du projet.

12. Quelles parties prenantes étaient les plus favorables ?

La commune a été un acteur central et actif dans le projet. Les producteurs locaux se sont également inscrits dans le développement.

13. Quelles parties prenantes ont été les plus contraignantes ?

Les riverains ont constitué une partie plus difficile à gérer, car leur intégration dans certains comités de suivi n'a pas toujours été positive et l'information était parfois utilisée contre le projet.

14. Y a-t-il eu des conflits, tensions ou décalages significatifs ?

Oui. Même si des comités de suivi ont été mis en place avec les riverains, cela n'a pas toujours produit un effet positif. Des ajustements ont été faits avec PlantC et une ASBL pour

définir les écrans végétaux les plus importants pour les riverains concernés.

- **Section 4. Contraintes et points de blocage**

15. Quels ont été les principaux points de blocage ?

Les principales contraintes ont concerné la cellule GISER et la DDR, ainsi que de nombreuses péripéties administratives.

16. À quel stade ces points de blocage sont-ils apparus ?

Pendant l’instruction du projet et la procédure de permis.

17. Quel point de blocage a eu l’impact le plus fort ?

Les contraintes administratives et réglementaires, qui ont nécessité un important travail d’adaptation et de discussion avec l’administration.

18. Y a-t-il eu des contraintes inattendues ?

Oui. Le projet pilote a été autorisé sous certaines conditions, notamment un périmètre autorisé pour 10 ans, ce qui crée un problème de financement car la banque ne finance pas un projet sur seulement 10 ans.

- **Section 5. Raccordement et réseau**

19. Dans quelle mesure le raccordement a-t-il affecté le projet ?

Le raccordement n’a pas constitué un obstacle majeur. Le projet bénéficie d’un raccordement à la rue en moyenne tension.

20. La saturation du réseau a-t-elle été un enjeu majeur ?

Non, la saturation réseau ne semble pas avoir été un problème majeur. Le fait que la puissance soit inférieure à 5 MW a permis un raccordement plus abordable.

21. Y a-t-il eu des difficultés significatives liées au raccordement ?

Non, aucune difficulté majeure particulière n’a été mentionnée.

22. Quels acteurs réseau étaient impliqués et quel a été leur rôle ?

Aucun acteur réseau spécifique n’a été mentionné. Le point principal est que le projet peut être raccordé à la rue en moyenne tension.

23. Les contraintes réseau ont-elles affecté le calendrier, le design, la capacité ou la faisabilité ?

Pas de manière négative majeure. Le fait d’être en dessous du seuil de 5 MVA a rendu le raccordement économiquement plus abordable.

- **Section 6. Arbitrages économiques et stratégiques**

24. Quels ont été les principaux compromis économiques ?

Le projet a été retravaillé pour intégrer les contraintes de l’agriculteur. Les structures ont dû être montées plus haut, ce qui a réduit le nombre de mégawatts installés et augmenté les CAPEX.

25. Quels facteurs ont le plus affecté la faisabilité ou l’attractivité du projet ?

L’intégration des contraintes agricoles, les adaptations du design, et les conditions administratives du projet pilote, notamment la limitation à 10 ans qui pose un problème de bancabilité.

26. Le projet a-t-il nécessité des adaptations de design importantes ?

Oui. Plusieurs adaptations ont été nécessaires, notamment le rehaussement des structures et des plans modificatifs successifs.

27. Y a-t-il eu des arbitrages entre usage du sol, acceptation, faisabilité technique et rentabilité ?

Oui. Le projet a dû être adapté pour rester compatible avec l'usage agricole, ce qui a entraîné une réduction de puissance et une hausse des coûts. Il y a donc eu un arbitrage entre intégration agricole, acceptabilité locale, design technique et rentabilité économique.

- **Section 7. Résultat du projet**

28. Le projet a-t-il évolué comme prévu initialement ?

Non, le projet a fortement évolué.

29. Si non, qu'est-ce qui a changé et pourquoi ?

Le projet a évolué à travers plusieurs plans modificatifs afin d'intégrer progressivement les contraintes apparues pendant le développement.

30. Quel est le résultat actuel du projet ?

Le projet est autorisé en première instance.

31. Si le projet a été retardé, suspendu, redessiné ou abandonné, pourquoi ?

Le projet a été retardé à plusieurs reprises par l'administration et a été redessiné pour intégrer les différentes contraintes au fil du temps.

- **Section 8. Enseignements**

32. Quels sont les principaux enseignements tirés de ce projet ?

Un terrain communal porté par une commune constitue un facteur important d'acceptabilité, non pas nécessairement au niveau local, mais au niveau de la Région wallonne. Le projet montre aussi l'importance de l'adaptation continue du design.

33. Que ferait-elle différemment aujourd'hui ?

Le vocal ne le formule pas explicitement, mais il ressort qu'il serait utile d'anticiper davantage les contraintes administratives, agricoles et de financement dès le départ.

34. Quel a été selon elle le facteur le plus décisif ?

La combinaison entre le portage communal, qui a favorisé l'acceptabilité au niveau régional, et les contraintes administratives qui ont retardé et complexifié le projet.

35. Commentaire additionnel

Le projet montre qu'un fort soutien communal peut constituer un levier important de légitimation du projet auprès des autorités régionales, même si l'acceptabilité locale reste plus ambiguë.

C. Interview Limoy

• Section 1. Informations générales

1. Nom du projet

Limoy

2. Localisation

Le site de Limoy.

3. Nom / fonction de la répondante

Participant 3, cheffe de projet

4. Type de projet

Projet photovoltaïque sur site dégradé / ancien site de dégazage traité par la SPAQUE.

5. Type de terrain concerné

Zone dégradée, ancien site de dégazage traité par la SPAQUE.

6. Taille / capacité approximative du projet

2,6 ha

7. Statut actuel du projet

Projet autorisé, mais bloqué au stade de la construction.

• Section 2. Logique initiale du projet

8. Quelle était la logique initiale du projet ?

Valoriser un ancien site dégradé / de dégazage déjà traité par la SPAQUE, dans une logique de déploiement des énergies renouvelables en Wallonie.

9. Pourquoi ce site était-il considéré comme attractif au départ ?

Il s'agissait déjà d'une zone dégradée, ce qui simplifiait le processus d'autorisation.

L'agriculture n'était pas en jeu et il n'était pas nécessaire de justifier une dérogation à la zone agricole.

10. Quels étaient les principaux bénéfices attendus au départ ?

Développer un projet renouvelable sur un site déjà dégradé, avec un processus d'autorisation plus simple que sur un terrain agricole.

• Section 3. Parties prenantes

11. Qui étaient les principales parties prenantes impliquées ?

La SPAQUE, la cellule GISER, ORES, les riverains / parties prenantes paysagères, et les équipes projet.

12. Quelles parties prenantes étaient les plus favorables ?

Le fait que le site soit déjà dégradé et traité par la SPAQUE semble avoir constitué un facteur favorable au projet sur le plan général de l'autorisation.

13. Quelles parties prenantes ont été les plus contraignantes ?

La cellule GISER en raison des questions liées à la technologie utilisée et à la gestion de l'eau, la SPAQUE car le projet dépend de la fin de ses travaux, et ORES puisque la construction est bloquée en attendant le raccordement pour le prélèvement des batteries.

14. Y a-t-il eu des conflits, tensions ou décalages significatifs ?

Pas de conflit direct majeur mentionné, mais des dépendances fortes entre les acteurs, le projet dépendant à la fois des travaux de la SPAQUE, des exigences de la cellule GISER et du raccordement par ORES.

- **Section 4. Contraintes et points de blocage**

15. Quels ont été les principaux points de blocage ?

Les contraintes posées par la cellule GISER concernant la technologie utilisée, la nécessité de gérer l'écoulement et la temporisation des eaux, la dépendance à la fin des travaux de la SPAQUE, le raccordement ORES pour le prélèvement des batteries, et des incertitudes liées à la stabilité du terrain.

16. À quel stade ces points de blocage sont-ils apparus ?

Pendant le développement technique et administratif du projet, puis au moment de la préparation de la construction.

17. Quel point de blocage a eu l'impact le plus fort ?

Le projet est surtout bloqué aujourd'hui par l'attente du raccordement par ORES et l'attente de la fin des travaux de la SPAQUE.

18. Y a-t-il eu des contraintes inattendues ?

Oui. L'ampleur des exigences liées à la gestion des eaux du fait de la technologie utilisée, ainsi que les questions potentielles de stabilité du terrain sur un site dégazé.

- **Section 5. Raccordement et réseau**

19. Dans quelle mesure le raccordement a-t-il affecté le projet ?

Le raccordement affecte fortement le projet puisqu'il bloque actuellement la phase de construction.

20. La saturation du réseau a-t-elle été un enjeu majeur ?

Oui, il faut attendre le raccordement ORES pour le prélèvement des batteries.

21. Y a-t-il eu des difficultés significatives liées au raccordement ?

Oui, dans la mesure où le projet est en attente du raccordement ORES, notamment pour le prélèvement des batteries.

22. Quels acteurs réseau étaient impliqués et quel a été leur rôle ?

ORES est l'acteur réseau mentionné. Son intervention conditionne l'avancement vers la phase de construction.

23. Les contraintes réseau ont-elles affecté le calendrier, le design, la capacité ou la faisabilité ?

Oui. Les contraintes de raccordement affectent directement le calendrier du projet puisqu'elles empêchent le démarrage de la construction.

- **Section 6. Arbitrages économiques et stratégiques**

24. Quels ont été les principaux compromis économiques ?

Le projet a nécessité des aménagements techniques importants, notamment un réseau de rigoles / bassins / dispositifs de gestion des eaux, ce qui a alourdi les coûts.

25. Quels facteurs ont le plus affecté la faisabilité ou l'attractivité du projet ?

La simplicité relative du permis sur un site non agricole, les contraintes techniques liées à la gestion des eaux, la dépendance aux travaux de la SPAQUE, le raccordement ORES, et la stabilité potentiellement problématique du terrain.

26. Le projet a-t-il nécessité des adaptations de design importantes ?

Oui. Mise en place d'un réseau de rigoles et d'aménagements pour gérer l'écoulement, la temporisation et l'évacuation des eaux vers les prairies voisines.

27. Y a-t-il eu des arbitrages entre usage du sol, acceptation, faisabilité technique et rentabilité ?

Oui. Développer le projet sur un site dégradé facilite l'acceptabilité réglementaire et évite les tensions liées au foncier agricole, mais cela s'accompagne de contraintes techniques importantes, notamment la gestion des eaux, la stabilité du sol et la dépendance à des travaux externes.

- **Section 7. Résultat du projet**

28. Le projet a-t-il évolué comme prévu initialement ?

Le projet a pu être autorisé, mais il n'a pas encore pu entrer en construction comme espéré.

29. Si non, qu'est-ce qui a changé et pourquoi ?

Le projet s'est heurté à des contraintes techniques et opérationnelles plus importantes que prévu, notamment liées à l'eau, à la stabilité du terrain, aux travaux de la SPAQUE et au raccordement ORES.

30. Quel est le résultat actuel du projet ?

Le projet est autorisé, mais bloqué au stade de la construction.

31. Si le projet a été retardé, suspendu, redessiné ou abandonné, pourquoi ?

Le projet est retardé / bloqué principalement à cause de l'attente du raccordement ORES, de l'attente de la fin des travaux de la SPAQUE, et des contraintes techniques liées au terrain et à la gestion des eaux.

- **Section 8. Enseignements**

32. Quels sont les principaux enseignements tirés de ce projet ?

Un site dégradé peut simplifier le processus d'autorisation en évitant les enjeux agricoles, mais il peut aussi générer des contraintes techniques très spécifiques, notamment en matière de gestion des eaux, de stabilité du terrain et de coordination avec des acteurs externes comme la SPAQUE.

33. Que ferait-elle différemment aujourd'hui ?

Il serait utile d'anticiper davantage les contraintes GISER liées à la technologie choisie, la gestion hydraulique du site, la dépendance au calendrier de la SPAQUE, et les conditions de raccordement ORES.

34. Quel a été selon elle le facteur le plus décisif ?

La combinaison entre la complexité technique du site dégradé et la dépendance à des acteurs externes, en particulier la SPAQUE et ORES.

35. Commentaire additionnel

Le projet illustre bien qu'un site dégradé peut être plus simple à autoriser sur le plan foncier et réglementaire, mais beaucoup plus complexe sur le plan technique, opérationnel et temporel.

D. Interview Fleurus

• Section 1. Informations générales

1. Nom du projet

Fleurus

2. Localisation

Fleurus

3. Nom / fonction de la répondante

Participant 4, cheffe de projet

4. Type de projet

Projet photovoltaïque en zone de dépendance d'extraction

5. Type de terrain concerné

Terrain agricole situé en zone de dépendance, le long d'une route de type route de Charleroi, sous une couche de qualité médiocre / caillouteuse, donc peu propice à l'agriculture.

6. Taille / capacité approximative du projet

6,8 ha pour 5,63 MW

7. Statut actuel du projet

En operation

• Section 2. Logique initiale du projet

8. Quelle était la logique initiale du projet ?

Valoriser un terrain agricole peu qualitatif, situé en zone de dépendance, en développant un projet photovoltaïque intégré et cohérent avec le site.

9. Pourquoi ce site était-il considéré comme attractif au départ ?

Le site était à l'abri des regards, situé le long d'une route, et implanté sur un sol de mauvaise qualité, caillouteux, donc assez impropre à l'agriculture.

10. Quels étaient les principaux bénéfices attendus au départ ?

Les bénéfices attendus étaient à la fois énergétiques et environnementaux. Le projet a été pensé comme un projet positif pour l'environnement, notamment grâce à l'intégration d'une zone de prés fleuris le long du site.

• Section 3. Parties prenantes

11. Qui étaient les principales parties prenantes impliquées ?

La commune de Fleurus, un fermier partenaire, les pompiers et les riverains aux alentours.

12. Quelles parties prenantes étaient les plus favorables ?

La commune de Fleurus semble avoir été assez ouverte au projet et a été intégrée en amont.

13. Quelles parties prenantes ont été les plus contraignantes ?

Quelques questions techniques ont été soulevées par les pompiers et par les riverains alentours, mais celles-ci ont pu recevoir des réponses.

14. Y a-t-il eu des conflits, tensions ou décalages significatifs ?

Il n'est pas fait mention de conflit majeur. Des questions techniques ont été soulevées, notamment par les pompiers et les riverains, mais elles ont été traitées. Le site semble relativement isolé, ce qui a limité les tensions.

• Section 4. Contraintes et points de blocage

15. Quels ont été les principaux points de blocage ?

Les principaux enjeux ont concerné la nécessité d'intégrer positivement le projet dans l'environnement, la gestion de la zone verte inscrite au plan de secteur, et certaines questions techniques soulevées par les pompiers et les riverains.

16. À quel stade ces points de blocage sont-ils apparus ?

Au cours du développement et de l'instruction du projet.

17. Quel point de blocage a eu l'impact le plus fort ?

L'enjeu principal a été l'intégration du projet dans son environnement et la manière de traiter la zone verte / plantée au plan de secteur de façon positive.

18. Y a-t-il eu des contraintes inattendues ?

Pas de contrainte inattendue majeure, mais la gestion de la zone verte et les questions techniques des parties prenantes ont nécessité des réponses adaptées.

- **Section 5. Raccordement et réseau**

19. Dans quelle mesure le raccordement a-t-il affecté le projet ?

Le raccordement auprès d'ORES a joué un rôle important dans le choix de la solution technique finale.

20. La saturation du réseau a-t-elle été un enjeu majeur ?

Pas de réponse précise

21. Y a-t-il eu des difficultés significatives liées au raccordement ?

Plusieurs options de raccordement ont été envisagées avant de retenir une solution en moyenne tension.

22. Quels acteurs réseau étaient impliqués et quel a été leur rôle ?

Les acteurs réseau ne sont pas nommés explicitement, mais la question du raccordement a conduit à comparer plusieurs options avant de choisir une solution plus efficace.

23. Les contraintes réseau ont-elles affecté le calendrier, le design, la capacité ou la faisabilité ?

Oui, dans une certaine mesure. Le choix final d'une option de raccordement en moyenne tension a permis de limiter le nombre de kilomètres, de faciliter l'accès au réseau et de réduire la durée des travaux.

- **Section 6. Arbitrages économiques et stratégiques**

24. Quels ont été les principaux compromis économiques ?

Il y a eu un arbitrage entre intégration environnementale et optimisation pure du projet.

25. Quels facteurs ont le plus affecté la faisabilité ou l'attractivité du projet ?

La faible qualité agricole du terrain, son faible impact visuel, son accessibilité et la possibilité de développer un projet intégré positivement dans l'environnement.

26. Le projet a-t-il nécessité des adaptations de design importantes ?

Oui. Le projet a été conçu comme un projet positif pour l'environnement, avec l'intégration d'une zone de prés fleuris le long du site afin de mieux répondre aux contraintes liées à la zone verte du plan de secteur.

27. Y a-t-il eu des arbitrages entre usage du sol, acceptation, faisabilité technique et rentabilité ?

Oui. Le projet a recherché un équilibre entre une valorisation énergétique d'un terrain peu productif sur le plan agricole, une intégration environnementale renforcée, la prise en compte des attentes locales, et une solution de raccordement techniquement et économiquement plus efficace.

- **Section 7. Résultat du projet**

28. Le projet a-t-il évolué comme prévu initialement ?

Non, il n'évolue jamais comme prévu

29. Si non, qu'est-ce qui a changé et pourquoi ?

Le projet a été affiné pour intégrer une dimension environnementale plus forte et pour choisir l'option de raccordement la plus adaptée.

30. Quel est le résultat actuel du projet ?

En opération

31. Si le projet a été retardé, suspendu, redessiné ou abandonné, pourquoi ?

Le raccordement a été le principal facteur du retard

- **Section 8. Enseignements**

32. Quels sont les principaux enseignements tirés de ce projet ?

Un site de faible qualité agricole et peu visible peut constituer une bonne opportunité de développement, surtout lorsqu'il est possible d'en faire un projet positif pour l'environnement et de travailler l'intégration locale en amont.

33. Que ferait-elle différemment aujourd'hui ?

/

34. Quel a été selon elle le facteur le plus décisif ?

La capacité à construire un projet bien intégré, à la fois sur le plan environnemental et sur le plan local, tout en trouvant une solution de raccordement efficace.

35. Commentaire additionnel

Le projet illustre bien l'intérêt de transformer un terrain peu productif et peu visible en un projet renouvelable à valeur environnementale ajoutée.

E. Interview Maisières

• Section 1. Informations générales

1. Nom du projet

Maisières

2. Localisation

Maisières

3. Nom / fonction de la répondante

Participant 5, cheffe de projet

4. Type de projet

Projet de panneaux photovoltaïques en configuration East-West, assorti d'une zone de préservation environnementale et d'écopâturage. Donc, il ne s'agit pas d'un projet agrivoltaïque, mais plutôt d'un projet écovoltaïque.

5. Type de terrain concerné

Zone de remblai de terres et de cailloux, liée à une activité de remblayage par TRADECOWALL.

6. Taille / capacité approximative du projet

12 ha pour 11,27 MW

7. Statut actuel du projet

En construction

• Section 2. Logique initiale du projet

8. Quelle était la logique initiale du projet ?

Le projet s'inscrit dans une logique de valorisation énergétique d'un site remblayé, en combinant une zone solaire et une zone de biodiversité. L'idée est de développer un second usage énergétique et environnemental une fois le remblai réalisé.

9. Pourquoi ce site était-il considéré comme attractif au départ ?

Le site était considéré comme pertinent car il s'agissait d'une zone remblayée, isolée, déjà fortement transformée, et donc compatible avec une logique de reconversion en projet énergétique et environnemental.

10. Quels étaient les principaux bénéfices attendus au départ ?

Développer une zone solaire, préserver / intégrer une zone de biodiversité, et combiner production d'énergie et valorisation environnementale du site.

• Section 3. Parties prenantes

11. Qui étaient les principales parties prenantes impliquées ?

TRADECOWALL, la commune, les riverains, l'exploitant précédent réalisant le remblai, le DNF, et les acteurs liés aux obligations environnementales du site.

12. Quelles parties prenantes étaient les plus favorables ?

Le projet a été construit en intégrant rapidement le DNF dans la boucle.

13. Quelles parties prenantes ont été les plus contraignantes ?

Le DNF apparaît comme un acteur central à intégrer rapidement, compte tenu des obligations environnementales liées au site.

14. Y a-t-il eu des conflits, tensions ou décalages significatifs ?

Le projet devait intégrer dès le départ des contraintes environnementales fortes.

- **Section 4. Contraintes et points de blocage**

15. Quels ont été les principaux points de blocage ?

Les obligations environnementales consécutives au remblai, la nécessité d'intégrer une zone de biodiversité, et le suivi d'éléments naturels spécifiques sur le site.

16. À quel stade ces points de blocage sont-ils apparus ?

Ces contraintes semblent avoir été identifiées dès le début, puisque le DNF a été intégré rapidement dans la boucle.

17. Quel point de blocage a eu l'impact le plus fort ?

Le principal facteur structurant semble être la prise en compte des obligations environnementales du site.

18. Y a-t-il eu des contraintes inattendues ?

/

- **Section 5. Raccordement et réseau**

19. Dans quelle mesure le raccordement a-t-il affecté le projet ?

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20. La saturation du réseau a-t-elle été un enjeu majeur ?

/

21. Y a-t-il eu des difficultés significatives liées au raccordement ?

/

22. Quels acteurs réseau étaient impliqués et quel a été leur rôle ?

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23. Les contraintes réseau ont-elles affecté le calendrier, le design, la capacité ou la faisabilité ?

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- **Section 6. Arbitrages économiques et stratégiques**

24. Quels ont été les principaux compromis économiques ?

Le projet repose sur un arbitrage entre valorisation énergétique du site et préservation / intégration environnementale.

25. Quels facteurs ont le plus affecté la faisabilité ou l'attractivité du projet ?

Le caractère isolé du site, sa nature déjà dégradée / remblayée, la possibilité de combiner projet solaire et biodiversité, et la prise en compte des obligations environnementales.

26. Le projet a-t-il nécessité des adaptations de design importantes ?

Oui, dans la mesure où le projet a été conçu comme un projet mixte associant une zone solaire et une zone de biodiversité, avec écopâturage.

27. Y a-t-il eu des arbitrages entre usage du sol, acceptation, faisabilité technique et rentabilité ?

Oui. Le projet semble illustrer un compromis entre valorisation énergétique, préservation environnementale, contraintes réglementaires liées au site et réutilisation d'un terrain déjà anthropisé.

- **Section 7. Résultat du projet**

28. Le projet a-t-il évolué comme prévu initialement ?

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29. Si non, qu'est-ce qui a changé et pourquoi ?

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30. Quel est le résultat actuel du projet ?

/

31. Si le projet a été retardé, suspendu, redessiné ou abandonné, pourquoi ?

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- **Section 8. Enseignements**

32. Quels sont les principaux enseignements tirés de ce projet ?

Un site remblayé et isolé peut être valorisé à travers une approche combinant production solaire et biodiversité, à condition d'intégrer très tôt les contraintes environnementales et les acteurs compétents comme le DNF.

33. Que ferait-elle différemment aujourd'hui ?

/

34. Quel a été selon elle le facteur le plus décisif ?

La capacité à articuler valorisation énergétique du site et respect des obligations environnementales.

35. Commentaire additionnel

Le projet de Maisières semble être un bon exemple de reconversion d'un site déjà fortement transformé, non pas en projet agrivoltaïque, mais en projet écovoltaïque associant solaire, biodiversité et écopâturage.

F. Interview Virton

• Section 1. Basic project information

1. Project name:

Virton Agri-PV Project

2. Location:

Virton

3. Name / role of respondent:

Participant 6 - Project Manager

4. Type of project:

Agrivoltaics

5. Type of land concerned:

Agricultural land and pastures

6. Approximate size / capacity of the project:

Approximately 10 hectares

7. Current status of the project:

Under development - permit application in preparation / submitted

• Section 2. Initial rationale of the project

8. What triggered the launch of this project?

The project was initiated because of the presumed proximity of a medium-voltage loop for grid connection and the presence of a motivated agricultural partner.

9. Why was this site considered suitable or attractive at the beginning?

The site was considered attractive because of its very good solar exposure and the relatively limited constraints, apart from nearby residents.

10. What were the main expected benefits at the start?

The main expected benefits were local renewable energy production and agrivoltaic value.

• Section 3. Stakeholders involved

11. Who were the main stakeholders involved in the project?

- The main stakeholders included:
- the engineering consultancy BE-maps,
- the farmer-operator,
- the landowner,
- Agri-Ose,
- the municipality,
- the natural park,
- the Department of Nature and Forests,
- the DDR,
- ORES,
- Econova,
- and local residents.

Residents were involved through an online survey and a citizen meeting.

12. Which stakeholders were the most supportive of the project?

The landowner and the farmer-operator were very supportive. ORES was neutral. Public stakeholders were generally neutral and receptive rather than openly opposed. Following the

citizen meeting, local residents were globally supportive, except for a limited number of immediate neighbors.

13. Which stakeholders were the most difficult to manage or the most constraining?

The closest residents were the most difficult stakeholders to manage.

14. Were there any significant conflicts, tensions, or misalignments between stakeholders?

No major conflicts emerged among most stakeholders. Tensions mainly came from a small group of nearby residents.

- **Section 4. Main constraints and blocking points**

15. What were the main blocking points encountered during the project?

The main difficulty came from delays caused by the engineering consultancy and by the time required to identify and address all project constraints.

16. At what stage did these blocking points appear?

These difficulties appeared during the project definition phase, especially while identifying constraints and integrating a large number of stakeholders into the process.

17. Which blocking point had the strongest impact on project progress?

The strongest impact came from the decision to involve significantly more stakeholders than usual.

18. Were there any unexpected constraints that had not been anticipated at the beginning?

Yes. Two main unexpected constraints emerged:

ORES provided a grid connection offer that was much more expensive than expected; opposition from the closest residents was stronger than anticipated.

- **Section 5. Grid connection and network constraints**

19. To what extent did grid connection affect the project?

Grid connection had a strong impact because of both its cost and the long implementation time for the required works.

20. Was network saturation a major issue in this project? Why or why not?

Yes. Network saturation was a significant issue because the existing cables would need to be replaced in order to absorb the electricity produced by the project.

21. Were there significant difficulties related to access to connection capacity, substations, or grid availability?

Connection was technically possible, but it required the installation of a new cable up to the substation.

22. Which grid-related actors were involved, and how did they influence the project?

ORES was the main grid-related actor. In addition, there was a desire to allow local residents to benefit from the electricity produced, but Wallonia has not yet enabled energy sharing for this type of project.

23. Did grid constraints affect the timeline, design, capacity, or overall feasibility of the project?

Yes, clearly. Grid constraints affected the project's financing conditions and significantly increased development timelines.

- **Section 6. Economic and strategic trade-offs**

24. What were the main economic trade-offs in this project?

The project was positioned as a contribution to Wallonia's PACE 2030 objectives and to national energy independence.

25. Which factors most affected the project's feasibility or attractiveness?

The most critical factor was the agricultural dimension of the project, especially whether policymakers would consider the agrivoltaic concept credible and legitimate as an agricultural project.

26. Did the project require important design adaptations in order to remain viable?

Yes. Important design changes were made for environmental reasons, agricultural reasons, and in order to relocate the technical area in response to local residents' concerns.

27. Were there trade-offs between land use, stakeholder acceptance, technical feasibility, and profitability?

Yes. Trade-offs emerged for environmental reasons, agricultural reasons, and because the technical zone had to be moved in response to residents' concerns.

- **Section 7. Outcome of the project**

28. Did the project evolve as initially expected?

No. It was expected to move faster and at a lower cost.

29. If not, what changed during development, and why?

The project became more complex because of the broad stakeholder consultation process, the stronger-than-expected grid constraints, and the need to redesign certain parts of the project.

30. What is the current outcome of the project?

The project is currently at the permit application stage.

31. If the project was delayed, suspended, redesigned, or abandoned, what were the main reasons?

The project was delayed and redesigned for environmental and agricultural reasons, and because the technical area had to be moved in response to local residents' concerns.

- **Section 8. Lessons learned**

32. Looking back, what are the main lessons learned from this project?

The main lessons are:

not to lock the project too quickly at an early stage,
to identify all relevant land parcels properly from the beginning,
and to understand the local context thoroughly, as this is absolutely essential.

33. What would you do differently if the project started again today?

No specific answer was provided.

34. In your opinion, what was the single most decisive factor in the project's success, delay, or difficulty?

The most decisive factors were broad stakeholder consultation, the need for a robust agricultural project, and the difficulty of quickly identifying local demand for the energy produced.

35. Any additional comments or observations that you believe are important for understanding this project?

It is important to take into account that the agrivoltaic topic remains highly complex in Wallonia.

G. Interview Fontilloi

- **Section 1. Basic project information**

1. Project name:

Fontilloi Photovoltaic Project

2. Location:

Belgrade, Province of Namur

3. Name / role of respondent:

Participant 7 - Project Manager

4. Type of project:

Ground-mounted photovoltaic project on polluted land, with an agrivoltaic component on the backfilled section

5. Type of land concerned:

Polluted land managed by SPAQuE, a former backfilled area previously used by Tradecowall, and a small portion of pastureland

6. Approximate size / capacity of the project:

Approximately 15 hectares, with an installed capacity of 12 MWp

7. Current status of the project:

Authorized (permit obtained), but awaiting grid connection

- **Section 2. Initial rationale of the project**

8. What triggered the launch of this project?

The project was initiated as an opportunity to valorize a polluted site that would otherwise have remained dedicated only to remediation for many years. The presumed ease of obtaining a permit was also a key driver.

9. Why was this site considered suitable or attractive at the beginning?

The site was considered attractive because of its excellent solar exposure, limited landscape impact, and status as polluted land, which was expected to simplify development.

10. What were the main expected benefits at the start?

The project aimed to produce renewable energy, create value from otherwise unusable land, and return approximately 4 hectares to agricultural use through agrivoltaics.

- **Section 3. Stakeholders involved**

11. Who were the main stakeholders involved?

The main stakeholders were Ether Energy, SPAQuE, Tradecowall, the agricultural partner, the Walloon Region, ORES, and neighboring landowners.

12. Which stakeholders were the most supportive?

The agricultural operator, SPAQuE, and Tradecowall were the most supportive. Overall, the project was well accepted.

13. Which stakeholders were the most difficult to manage?

ORES was the most difficult stakeholder because of the absence of a rapid grid connection solution and the high associated costs.

14. Were there any significant conflicts?

No. Relationships were described as excellent, including with the landowner, who has remained very patient. The only real blockage was technical and financial, linked to the grid operator.

- **Section 4. Main constraints and blocking points**

15. What were the main blocking points?

The main blocking points were grid connection and overall project financing, particularly because of the multiple technologies used in the project.

16. At what stage did these blocking points appear?

These problems appeared at the grid connection stage, after the permit had been obtained.

17. Which blocking point had the strongest impact?

Grid connection had the strongest impact. In its current state, the project cannot move forward.

18. Were there any unexpected constraints?

Yes. The extremely high cost of the grid connection and the very long delays proposed by ORES were unexpected.

- **Section 5. Grid connection and network constraints**

19. To what extent did grid connection affect the project?

The project is currently at a complete standstill because of grid connection.

20. Was network saturation a major issue?

Yes. Local network saturation and the unavailability of cables were major issues. There is also a grid withdrawal issue for neighboring companies.

21. Were there significant difficulties related to capacity?

Yes. Grid connection is technically possible, but it requires works that are too costly for the project to be viable under current conditions.

22. Which grid-related actors were involved?

ORES was the main grid-related actor. Direct-line options were studied, but they proved to be too administratively complex.

23. Did grid constraints affect the timeline?

Yes. Everything else is ready, including the permit and the design, but the project is blocked by the absence of a viable connection solution.

- **Section 6. Economic and strategic trade-offs**

24. What were the main economic trade-offs?

The project is intrinsically profitable, as both east-west and fixed technologies are very competitive, but the investment is blocked by the cost of the grid connection.

25. Which factors most affected the project's feasibility or attractiveness?

The most decisive factors were the value of the electricity produced, the financial burden of the connection works, and the broader bankability of the project.

26. Did the project require important design adaptations?

Yes, mainly technical adaptations were needed in order to follow the slopes of the backfilled site and to comply with remediation constraints.

27. Were there trade-offs between land use and profitability?

Yes. The project had to be adapted to the nature of the polluted soil while preserving sufficient panel density to remain economically viable.

- **Section 7. Outcome of the project**

28. Did the project evolve as initially expected?

Yes with regard to the permit, but absolutely not with regard to grid connection, which turned out to be much slower and more expensive than expected.

29. If not, what changed during development, and why?

The project became blocked at the connection stage because of the unexpectedly high cost and long delays of the connection offer.

30. What is the current outcome?

The project is suspended while alternative grid connection solutions are being explored.

31. Main reasons for delay/suspension?

The cost and timing of the electrical connection.

- **Section 8. Lessons learned**

32. What are the main lessons learned?

It is essential to obtain clear answers and work on grid connection solutions much earlier in the process.

33. What would you do differently?

Grid connection work would be initiated from day one, even if the permitting process itself would not necessarily be changed.

34. What was the single most decisive factor?

Grid connection, particularly in relation to Wallonia's electrification needs.

H. Interview Péronnes

- **Section 1. Basic project information**

1. Project name:

Péronnes

2. Location:

Péronnes-lez-Binche, Province of Hainaut

3. Name / role of respondent:

Participant 8 - Project Manager

4. Type of project:

Ground-mounted photovoltaic project on polluted land, with associated battery storage

5. Type of land concerned:

Officially agricultural land, but in practice a covered and remediated former landfill monitored by SPAQuE for the past two years, with a ten-year follow-up plan

6. Approximate size / capacity of the project:

Approximately 12 hectares for 9 to 10 MVA

7. Current status of the project:

The PV component is authorized (permit obtained). A grid connection contract has been received but is too expensive. The permit for the batteries is still pending.

- **Section 2. Initial rationale of the project**

8. What triggered the launch of this project?

The project was initiated because of the perceived opportunity to obtain a permit quickly on polluted land and because of an initially favorable estimate of the connection conditions.

9. Why was this site considered suitable or attractive at the beginning?

The site was considered attractive because of its excellent solar exposure, its expected administrative simplicity, and an initially attractive investment cost.

10. What were the main expected benefits at the start?

The main expected benefit was to revalorize a polluted brownfield through renewable energy, giving a useful function back to land that had been unusable for many years.

- **Section 3. Stakeholders involved**

11. Who were the main stakeholders involved?

The main stakeholders were Ether Energy, the municipality of Binche, local residents involved through a citizen meeting, SPAQuE, ORES, and potential contractors.

12. Which stakeholders were the most supportive?

The municipality and the public authorities were supportive, as shown by the relatively easy permitting process. Local residents were also generally supportive, with no major opposition.

13. Which stakeholders were the most difficult to manage?

ORES was the most difficult stakeholder because of the financial conditions attached to the grid connection.

14. Were there any significant conflicts?

No. Overall relations were very positive.

- **Section 4. Main constraints and blocking points**

15. What were the main blocking points?

The main blocking point was the grid connection offer from ORES, which was considered financially unviable.

16. At what stage did these blocking points appear?

The issue appeared after the permit had been obtained, when the technical and financial offer from ORES was received.

17. Which blocking point had the strongest impact?

Grid connection had the strongest impact.

18. Were there any unexpected constraints?

Yes. The cost of the grid connection was the only major unexpected constraint; the rest of the development process was relatively smooth.

- **Section 5. Grid connection and network constraints**

19. To what extent did grid connection affect the project?

At this stage, grid connection represents a total economic blockage.

20. Was network saturation a major issue?

Yes. Network saturation generated high costs because of cable sizing requirements and the distance to the source substation.

21. Were there significant difficulties related to capacity?

Yes. Technically, connection is possible, but financially it is not viable.

22. Which grid-related actors were involved?

ORES and a private service provider were involved in a counter-expertise of the pricing, which confirmed the high cost level.

23. Did grid constraints affect the timeline?

Yes. The project has been slowed down while alternative technical or financial solutions are being sought.

- **Section 6. Economic and strategic trade-offs**

24. What were the main economic trade-offs?

The main trade-off concerned maintaining the project's viability while absorbing the cost of grid connection.

25. Which factors most affected the project's feasibility or attractiveness?

The most important factor was the cost of the grid connection, which directly affected project bankability.

26. Did the project require important design adaptations?

No major design adaptations were required, apart from the technical constraints imposed by SPAQuE regarding the ground.

27. Were there trade-offs between land use and profitability?

The main trade-off concerned the reuse of remediated land while keeping the project economically viable despite connection costs.

- **Section 7. Outcome of the project**

28. Did the project evolve as initially expected?

Yes, up to the grid connection phase.

29. If not, what changed during development, and why?

The project became economically blocked once the grid connection offer was received.

30. What is the current outcome?

The project is authorized, but delayed / on hold.

31. Main reasons for delay?

The cost of grid connection and the pending battery permit.

- **Section 8. Lessons learned**

32. Looking back, what are the main lessons learned?

Grid connection studies need to be anticipated much earlier, even on sites that appear administratively straightforward.

33. What would you do differently?

The connection issue would be explored earlier and more thoroughly.

34. In your opinion, what was the single most decisive factor?

The grid connection.

I. Interview Momignies

- **Section 1. Basic project information**

1. Project name:

Momignies

2. Location:

Municipality of Momignies, Province of Hainaut, near Chimay

3. Name / role of respondent:

Participant 9 - Project Manager

4. Type of project:

Agrivoltaic project with sheep grazing

5. Type of land concerned:

Agricultural land historically used as cattle pasture, intended to be used for sheep grazing as part of the agrivoltaic project

6. Approximate size / capacity of the project:

Approximately 8 to 9 hectares for an installed capacity of 5 MW

7. Current status of the project:

Ready to be submitted for permit application.

- **Section 2. Initial rationale of the project**

8. What triggered the launch of this project?

The project was initiated because of the proximity to an AIESH injection substation and the possibility of developing a virtuous agrivoltaic project on pastureland.

9. Why was this site considered suitable or attractive at the beginning?

The site was considered attractive because of its agrivoltaic potential and the presumed technical ease of grid connection.

10. What were the main expected benefits at the start?

The objective was to develop a project with a local farmer and produce renewable energy in order to decarbonize local industry, specifically the glassworks.

- **Section 3. Stakeholders involved**

11. Who were the main stakeholders involved?

The main stakeholders were Ether Energy, the municipality of Momignies, the Momignies glassworks, the local farmer, the delegated public official, and AIESH.

12. Which stakeholders were the most supportive?

The delegated official was informally supportive, especially if the project injected electricity directly into the glassworks. The municipality was also very interested in the local dimension of the project.

13. Which stakeholders were the most difficult to manage?

The glassworks was the most difficult stakeholder because of the time required to obtain internal management approval. The municipality also required lengthy initial discussions.

14. Were there any significant conflicts?

No open conflicts emerged, but negotiations with the glassworks lasted for about one year. Residents will only be consulted after the permit application is submitted.

- **Section 4. Main constraints and blocking points**

15. What were the main blocking points?

The main blocking point was obtaining approval from the glassworks' management for self-consumption, which was only secured one week before the interview.

16. At what stage did these blocking points appear?

The problem emerged about one year earlier, when the technical project was already ready for permit submission.

17. Which blocking point had the strongest impact?

The internal decision-making delay within the glassworks, which postponed the permit application by a full year.

18. Were there any unexpected constraints?

Yes. The slowness of communication and decision-making within the industrial partner was unexpected.

- **Section 5. Grid connection and network constraints**

19. To what extent did grid connection affect the project?

AIESH's grid connection offer was favorable, but the project ultimately prioritized self-consumption by the glassworks for reasons linked to the philosophy of the project.

20. Was network saturation a major issue?

No major saturation issue was mentioned.

21. Were there significant difficulties related to capacity?

No major capacity difficulties were reported.

22. Which grid-related actors were involved?

AIESH was the main grid-related actor. Its grid connection offer took two years to obtain, but it was considered reasonable.

23. Did grid constraints affect the timeline?

No. The delay was not caused by the grid connection itself, but by the time needed to secure agreement for direct injection into the glassworks.

- **Section 6. Economic and strategic trade-offs**

24. What were the main economic trade-offs?

The main trade-off was to prioritize local industrial decarbonization through self-consumption rather than choosing a more standard grid injection model.

25. Which factors most affected the project's feasibility or attractiveness?

The most decisive factor was the ability to build a credible local self-consumption model with the industrial partner.

26. Did the project require important design adaptations?

No major design adaptations were explicitly mentioned.

27. Were there trade-offs between land use and profitability?

Yes. Sheep grazing was integrated in order to preserve agricultural use while simultaneously producing renewable energy.

- **Section 7. Outcome of the project**

28. Did the project evolve as initially expected?

No. The permit submission was delayed by one year compared to the initial technical schedule.

29. If not, what changed during development, and why?

The project was delayed because of the time needed to secure agreement from the industrial partner.

30. What is the current outcome?

The permit application is about to be submitted. The municipality becomes the competent authority thanks to the self-consumption model.

31. Main reasons for delay?

The delay was caused by the time needed to secure the industrial partner's agreement.

- **Section 8. Lessons learned**

32. Looking back, what are the main lessons learned?

It is essential to engage directly with decision-makers within partner companies and to maintain fluid communication throughout the process.

33. What would you do differently?

All key strategic stakeholders would be identified and involved much earlier in order to avoid decision-making delays.

34. In your opinion, what was the single most decisive factor?

Consultation with the industrial partner and the strength of the agrivoltaic project concept.

J. Interview Calcaire de Florennes

• Section 1. Informations générales sur le projet

1. Nom du projet :

Calcaire de Florennes

2. Localisation :

Florennes

3. Nom / fonction du répondant :

Participant 10

4. Type de projet :

Projet agrivoltaïque

5. Type de terrain concerné :

Zone agricole

6. Taille / capacité approximative du projet :

3,3 hectares

7. Statut actuel du projet :

En operation

• Section 2. Logique initiale du projet

8. Quelle était la raison initiale d'envisager ce projet ?

Le projet a été envisagé principalement pour deux raisons :

la proximité entre l'unité de production et le site de consommation, permettant l'autoconsommation ;

le fait que le foncier appartient à la carrière, qui ne prévoit pas d'utiliser cette zone au cours des 30 à 50 prochaines années.

9. Pourquoi ce site était-il considéré comme adapté ou attractif au départ ?

Le site était considéré comme attractif principalement en raison de son potentiel d'autoconsommation.

10. Quels étaient les principaux bénéfices attendus du projet au départ ?

L'objectif était de maintenir le pâturage ovin tout en produisant de l'électricité.

• Section 3. Parties prenantes impliquées

11. Quelles étaient les principales parties prenantes impliquées dans le projet ?

Calcaire de Florennes

La commune de Florennes

12. Quelles parties prenantes ont été les plus favorables au projet ?

La commune de Florennes.

13. Quelles parties prenantes ont été les plus difficiles à gérer ou les plus contraignantes ?

Le DNF a remis un avis favorable sous conditions, notamment concernant la plantation de haies et la préservation d'une zone en pelouse calcaire.

14. Y a-t-il eu des conflits, tensions ou désalignements importants entre les parties prenantes ? Si oui, expliquez brièvement.

Oui.

La DDR était opposée au projet, car le demandeur n'était pas agriculteur et le projet n'était pas considéré comme un projet agricole au regard de la réglementation.

La Région wallonne a refusé le projet dans un premier temps, estimant qu'il compromettait la destination de la zone agricole au plan de secteur.

- **Section 4. Contraintes principales et points de blocage**

15. Quels ont été les principaux points de blocage rencontrés dans le projet ?

Le principal point de blocage a été le caractère agricole du projet.

16. À quel stade du projet ces points de blocage sont-ils apparus ?

Ces blocages sont apparus après le dépôt de la demande de permis, lors de la première introduction du permis le 4 février 2022.

17. Quel point de blocage a eu l'impact le plus fort sur l'avancement du projet ?

Le caractère agricole du projet.

18. Y a-t-il eu des contraintes inattendues qui n'avaient pas été anticipées au départ ? Si oui, expliquez.

Oui. La principale contrainte inattendue a été la remise en question du caractère agricole du projet.

- **Section 5. Raccordement et contraintes réseau**

19. Dans quelle mesure le raccordement au réseau a-t-il affecté le projet ?

Le raccordement n'a pas constitué un problème majeur. La cabine de tête de Calcaire de Florennes prévoyait déjà de l'injection il y a environ cinq ans, à une époque où les contraintes réseau étaient moins fortes qu'aujourd'hui.

20. La saturation du réseau a-t-elle été un enjeu important dans ce projet ? Pourquoi ?

Non. La saturation du réseau n'a pas constitué un problème majeur dans ce projet.

21. Y a-t-il eu des difficultés significatives liées à l'accès à la capacité de raccordement, aux postes ou à la disponibilité du réseau ?

Non. Il n'y a pas eu de difficulté significative, notamment parce que le projet a été développé dans un contexte où les contraintes réseau étaient moins importantes.

22. Quels acteurs liés au réseau sont intervenus, et comment ont-ils influencé le projet ?

ORES était l'acteur réseau impliqué. Aucun problème particulier n'a été signalé, notamment parce qu'il s'agissait de Calcaire de Florennes.

23. Les contraintes réseau ont-elles affecté le calendrier, le design, la capacité ou la faisabilité globale du projet ? Si oui, comment ?

Non. Les contraintes réseau n'ont pas affecté de manière significative le calendrier, le design, la capacité ou la faisabilité globale du projet. L'autoconsommation restait présente dans tous les cas.

- **Section 6. Arbitrages économiques et stratégiques**

24. Quels ont été les principaux arbitrages économiques dans ce projet ?

Le principal enjeu économique du projet résidait dans la valorisation locale de l'électricité via l'autoconsommation de la carrière.

25. Quels facteurs ont le plus affecté la faisabilité ou l'attractivité du projet ?

Les facteurs les plus déterminants ont été :

la valorisation de l'électricité afin de rendre le business plan viable ;

le raccordement ;

la nécessité de pratiquer du curtailment pour éviter les prix négatifs ;

l'existence d'une autoconsommation, qui a renforcé la viabilité du projet.

26. Le projet a-t-il nécessité des adaptations importantes dans son design pour rester viable ? Si oui, expliquez.

Oui. Le projet a dû respecter l'ensemble des conditions du permis et des avis rendus, tout en assurant une valorisation suffisante de l'électricité pour que le business plan reste viable.

27. Y a-t-il eu des arbitrages entre usage du sol, acceptation des parties prenantes, faisabilité technique et rentabilité ? Si oui, décrivez-les brièvement.

Non, pas de manière particulièrement marquée.

- **Section 7. Résultat du projet**

28. Le projet a-t-il évolué comme prévu initialement ?

Oui, malgré certaines contraintes liées au refus initial du permis.

29. Si non, qu'est-ce qui a changé au cours du développement, et pourquoi ?

Des adaptations ont été nécessaires à la suite du refus initial du permis.

30. Quel est aujourd'hui le résultat du projet ?

Le projet est aujourd'hui viable et en opération.

31. Si le projet a été retardé, suspendu, redessiné ou abandonné, quelles en ont été les principales raisons ?

Pas de réponse particulière à apporter ici.

- **Section 8. Enseignements tirés**

32. Avec le recul, quels sont les principaux enseignements tirés de ce projet ?

/

33. Que feriez-vous différemment si le projet devait recommencer aujourd'hui ?

/

34. Selon vous, quel a été le facteur le plus décisif dans le succès, le retard ou la difficulté du projet ?

L'autoconsommation.

Commentaires additionnels facultatifs

35. Y a-t-il d'autres commentaires ou observations qui vous paraissent importants pour comprendre ce projet ?

/

K. Complementary Expert Interview - Project Sourcing

- **Section 1. Basic information**

Name / role of respondent:

Participant 11

Current position / function:

Business Developer - Sourcing Manager

How would you describe your role in the identification or initiation of renewable energy projects?

Finding, negotiating, and signing agreements with landowners to develop new projects.

At what stage of the project lifecycle do you usually intervene?

The very first one, when we need to find new opportunities.

- **Section 2. Identification of project opportunities**

How do potential solar PV project opportunities usually emerge?

It depends on the type, but it usually emerges when a landowner is looking for a way to bring value to its land or diversify its revenues.

What usually makes a site worth considering at the very beginning?

The surface is a key element. If it's too little, there's no project. Then there are environmental constraints and the use of the land (is it compatible with a solar project?) and finally the distance to the injection point.

What are the main criteria you use to decide whether a site is worth exploring further?

More than 30.000 m², no Natura 2000 or other preserved area, well exposed (south or flat), the current use is compatible with the project, options for injection in the area.

Are some types of land generally more attractive than others at the prospecting stage? If yes, why?

Les friches industrielles et les anciennes carrières sont clairement les plus intéressants, car ce sont généralement des espaces délaissés qui ne servent plus et qui n'ont que peu de valeur.

- **Section 3. Land and site-related factors**

What makes underutilized land interesting for solar development?

We bring value to a place that has very little and on ne concurrence pas l'usage des sols.

What makes underutilized land difficult for solar development?

Ils sont souvent fort accidentés et ont des aléas (eau, enviro, etc.) qui peuvent être assez contraignants.

Do different land types create different opportunities or different risks? If yes, please explain briefly.

Les friches industrielles ont souvent un sol pollué qu'il faut parfois dépolluer avant un projet. Ils subir une érosion importante ou une nature qui a repris ses droits. Chaque zone a ses contraintes.

In your experience, are there land-related characteristics that quickly make a site unattractive?

Natura 2000, aléa d'inondation, périmètre d'intérêt paysager ou alors trop exposé aux habitations.

- **Section 4. Stakeholders at the initiation stage**

Which stakeholders are usually the most important at the project initiation stage?

The landowner and optionally the current user of the land.

Which stakeholders tend to facilitate the early development of a project?

The landowner, the municipality.

Which stakeholders tend to create the greatest uncertainty or constraints at this stage?

The neighbors.

To what extent do stakeholder perceptions already matter during prospecting or site screening?

If it's too close to a residential area, we often give up before signing up.

Have you observed cases where expected stakeholder tensions made a site less attractive or led to abandoning it? If yes, please explain briefly.

Yes, comité de riverains qui montent une pétition.

- **Section 5. Grid connection and network constraints**

How important is grid connection at the prospecting stage?

Important, but not crucial.

How early is network saturation taken into account when assessing a site?

It's one of the first analysis we make, but it does not decide everything.

Can connection difficulty prevent a site from being pursued at all? Why or why not?

It's part of the criteria, but the connection often evolves with project development, so it's not prohibitive.

How does grid access influence the attractiveness of a site compared with land-related or stakeholder-related factors?

It creates uncertainties that are more technical (than human).

- **Section 6. Feasibility, risks, and project selection**

What are the main red flags that can quickly discourage or stop further development?

Strong local opposition and no grid access.

Are there trade-offs already visible at the initiation stage between land use, stakeholder acceptability, technical feasibility, and economic attractiveness? If yes, please describe them briefly. We try to get as many answers as possible before signing a contract on the land, but the amount of effort we can provide at this stage is limited.

In your view, what makes the difference between a site that remains only an idea and a site that becomes a real project?

Strong local support + landowner supporting the project with time and effort.

- **Section 7. Lessons learned**

In your opinion, what is the single most decisive factor in determining whether a site is worth pursuing today?

Hard to say, there are always uncertainties, but land use is a major criterion in terms of allowance. We know we can get a permit on certain type of field and that's the best start we can get (even though we're not sure about the grid or the local support).

APPENDIX C

Participant	Project	Role	Date	Data Type
Participant 1	Anthisnes	Project Manager	13 April 2026	Project case questionnaire
Participant 2	Les Bons Villers	Project Manager	13 April 2026	Project case questionnaire
Participant 3	Limoy	Project Manager	13 April 2026	Project case questionnaire
Participant 4	Fleurus	Project Manager	14 April 2026	Project case questionnaire
Participant 5	Maisières	Project Manager	14 April 2026	Project case questionnaire
Participant 6	Virton	Project Manager	15 April 2026	Project case questionnaire
Participant 7	Fontilloi	Project Manager	17 April 2026	Project case questionnaire
Participant 8	Péronnes	Project Manager	17 April 2026	Project case questionnaire
Participant 9	Momignies	Project Manager	17 April 2026	Project case questionnaire
Participant 10	Calcaire de Florennes	Project Manager	20 April 2026	Project case questionnaire
Participant 11	Cross-project sourcing	Expert	20 April 2026	Semi-structured interview

APPENDIX D: the cross-case comparison table used to support the empirical analysis of the ten solar PV projects.

Project	Land type	Stakeholder context	Dominant constraint	Grid constraint	Main feasibility effect	Project outcome
Anthisnes	Agricultural land, agrivoltaics	Medium to low	Political and institutional legitimacy	Low	Project remained technically viable, but political uncertainty undermined feasibility	Refused
Les Bons Villers	Agricultural land, agrivoltaics	Medium	Administrative and regulatory complexity	Low	Design adaptations increased capital expenditure and weakened economic optimization	Authorized in first instance
Limoy	Degraded / treated industrial site	High	Technical complexity and external coordination	High	Additional technical works and delays increased development costs and blocked implementation	Authorized but blocked before construction
Fleurus	Low-quality agricultural land in extraction dependency zone	High	Environmental integration	Moderate	Design optimization allowed the project to remain viable under environmental constraints	Operational
Maisières	Backfilled / anthropized site	Medium	Environmental obligations and biodiversity integration	Limited	Environmental integration requirements constrained design but supported project legitimacy	Under construction
Virton	Agricultural land and pastures, agrivoltaics	Medium	Stakeholder coordination and grid cost	High	Redesign, longer timelines, and expensive connection reduced project attractiveness	Under development
Fontilloi	Polluted land with backfilled section	High	Grid connection	Very high	Connection costs and delays blocked an otherwise attractive project	Suspended
Péronnes	Remediated former landfill / polluted site	High	Grid connection	Very high	Connection costs made the project economically unviable at this stage	Authorized but on hold
Momignies	Agricultural pasture, agrivoltaics	High	Industrial partner decision-making	Low	Delay affected project timing more than intrinsic viability	Permit submission delayed
Calcaire de Florennes	Agricultural land	Medium	Agricultural and regulatory legitimacy	Low	Self-consumption strengthened viability despite permit-related constraints	Operational

APPENDIX E: reproduces selected material from the citizen survey used in the Virton case to complement the project-level interview data.

METHODOLOGIE ET RESULTATS D'ANALYSE – PROJET AGRIPV VIRTON

1. Organisation et diffusion de l'enquête

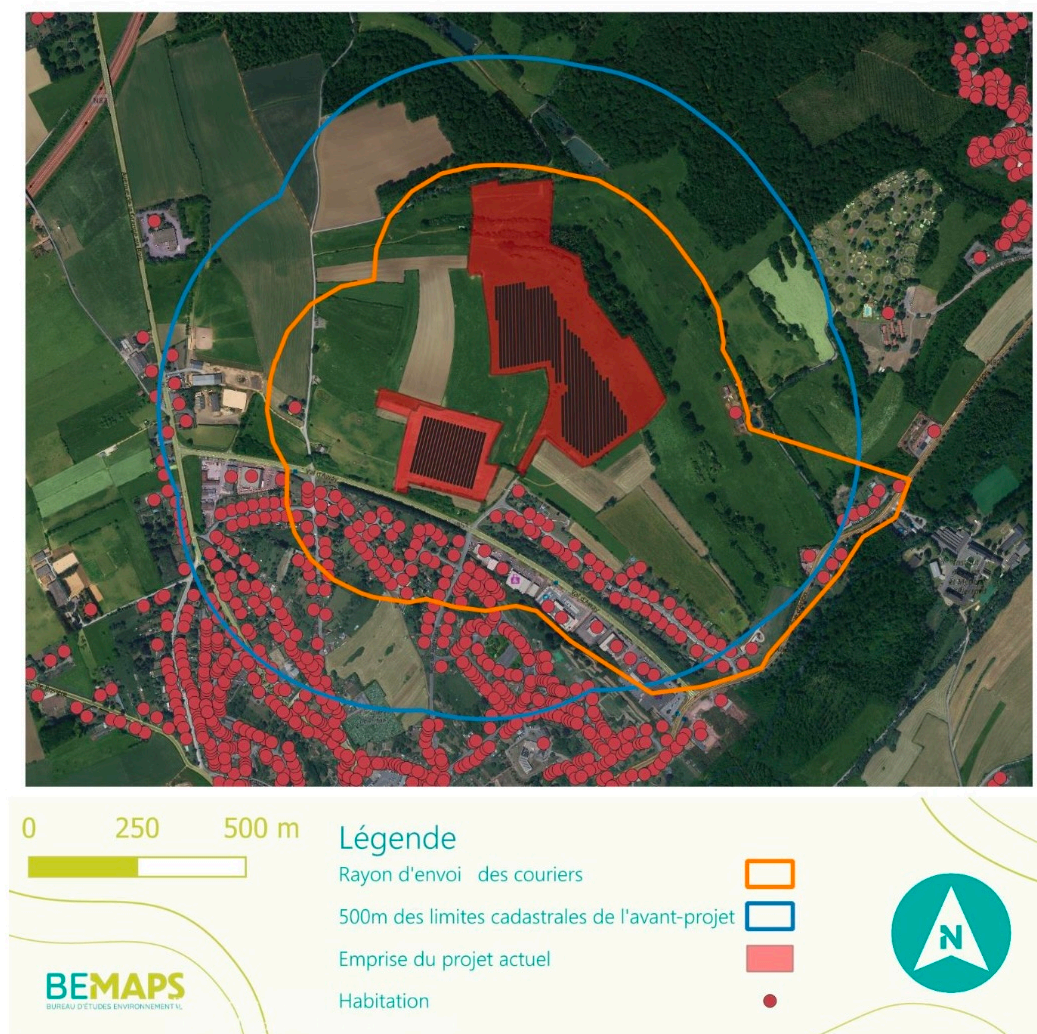


Figure 1: Carte du périmètre de diffusion du courrier d'information. Représentation des limites cadastrales du projet actuel (en rouge), du rayon d'envoi des courriers de 250 m ajusté (orange) utilisé pour identifier les riverains destinataires du courrier depuis les limites cadastrales de l'avant-projet initial et de son périmètre de 500 m (bleu) présenté à titre indicatif.

Dans le cadre du projet agrivoltaïque situé à Virton, une enquête citoyenne a été organisée afin d'informer les riverains et habitants concernés, de recueillir leurs avis et préoccupations, et de préparer un atelier participatif avec les experts et le porteur du projet prévu le 4 mars 2026.

Dans un premier temps, un **courrier d'information** a été adressé aux riverains situés dans un rayon jugés où les enjeux sont les plus forts. Ce périmètre théorique autour de l'avant projet a été ajusté

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