IN PURSUIT OF ENERGY AUTONOMY: TERRITORIAL POWER, DEPENDENCY AND LAND POLITICS IN MARTINIQUE AND REUNION ISLAND

Laure-Anne Plumhans

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Supervisor: Michael C. LaBelle (CEU)
Doctoral committee: Guntra Aistara (CEU), Anne Péné-Annette (Université des Antilles)

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"The transition is always at the horizon. The thing about the horizon is that it shifts further away as you approach it." (Interview, Reunion).

"It is always someone else's carnival, and we are standing by the side of the road watching it go by." (Interview, ASSAUPAMAR Martinique)

mon peuple
quand
hors des jours étrangers
germeras-tu une tête tienne sur tes épaules renouées
et ta parole
le congé dépêché aux traîtres
aux maîtres
le pain restitué la terre lavée
la terre donnée
quand
quand donc cesseras-tu d'être le jouet sombre
au carnaval des autres

my people
when
outside of foreign days
will you sprout a head of your own upon your rejoined shoulders
and your word
the swift farewell to the traitors
to the masters
the bread restored the earth cleansed
the earth given
when
when then will you cease to be the dark plaything at the carnival of others

Hors des jours étrangers Aimé Césaire, Ferrements (1960). Excerpt, own translation.

Author's Declaration

I, the undersigned, **Laure-Anne Plumhans**, candidate for the PhD degree in Environmental Sciences and Policy, declare herewith that the present thesis titled "In Pursuit of Energy Autonomy: Territorial Power, Dependency and Land Politics in Martinique and Reunion Island" is exclusively my own work, based on my research and only such external information as properly credited in notes and bibliography. I declare that no unidentified and illegitimate use was made of the work of others, and no part of the thesis infringes on any person's or institution's copyright. I also declare that no part of the thesis has been submitted in this form to any other institution of higher education for an academic degree.

Part of this dissertation has previously been published in a peer-reviewed journal:

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Finally, this work made limited use of the generative artificial intelligence (GenAI) tool ChatGPT for suggestions regarding sentence structure, writing syntax, and translation. This tool did not contribute to the substance, arguments, or analysis presented in this dissertation. I, the author, have reviewed and edited the content as necessary and take full responsibility for its accuracy, claims, and references.

Vienna, 14 November 2025

Laure-Anne Plumhans

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For bibliographic and reference purposes, this dissertation should be referred to as:

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Abstract

This dissertation investigates the energy transition of two French Overseas Islands, Martinique and Reunion. Both islands are on track to achieve 100% renewable electricity by converting their fossil production units to imported biomass. This milestone contradicts their ambition to achieve energy autonomy (i.e., producing all their energy locally). To understand this contradiction, the dissertation examines the implications of pursuing energy autonomy on the structure of territorial power inherited from the plantation system. This structure includes the continuous dependency upon an external center and an unequal, monocultural use of the land and its resources. For plantation islands like Martinique and Reunion, energy autonomy can have political consequences. By relocating energy production at home, energy autonomy can affect relationships of dependency between places and imply the local reorganization of the production of resources. In particular, space-intensive renewable technologies can impact existing land uses and related industries and interests. Yet, these territorial aspects are rarely addressed by scientific research, which fails to capture how energy autonomy can rework the structures of power between places and within them. These are crucial for places that lie at the periphery of central powers, such as Sub-National Islands Jurisdictions (SNIJs), where political autonomy and colonial struggles over the land are recurring political topics.

Fieldwork was conducted in both islands in 2023. The data collected includes semi-structured interviews, observation notes, and document analysis. Territorial theories and concepts taken from socio-technical and spatial imaginaries guided the analysis. The dissertation finds that the implementation of energy technologies harnessing local renewable resources challenges the territorial structure of the plantation. In Reunion, the implementation of renewables confronts existing land uses and beneficiaries, whereas in Martinique, it tends to benefit those who already extract value from the land. Yet, in both cases, the implementation of local renewables offers the opportunity for local actors to re-negotiate how the land is used and to whose benefit. Moreover, by reducing energy dependency, local energy production questions the structural dependencies that link these islands to the State and economic powers. In contrast, the reliance on imported biomass maintains dependency relationships and removes land politics from the electricity debate. Through these findings, the dissertation demonstrates that energy autonomy is more than a technical issue; it is a territorial problem impacting structures of power across scales. Understanding the territorial implications of different energy transition trajectories is relevant to identifying which futures they propose, the power relations they sustain, and how they are implemented or resisted.

Résumé

Cette thèse étudie la transition énergétique de deux îles françaises des Outre-mer, la Martinique et la Réunion. Toutes deux sont en voie d'atteindre un objectif de 100 % d'électricité renouvelable, principalement par la conversion de leurs unités de production fossiles en centrales à biomasse importée. Cette étape contredit pourtant leur ambition d'autonomie énergétique, c'est-à-dire de produire localement l'ensemble de leur énergie. Pour comprendre cette contradiction, la thèse examine les implications de l'autonomie énergétique sur la structure du pouvoir territorial héritée du système de plantation. Cette structure se caractérise par une dépendance continue envers un centre extérieur et par un usage inégal des terres et de leurs ressources. Pour des îles issues de ce système de plantation comme la Martinique et La Réunion, l'autonomie énergétique peut ainsi avoir des conséquences politiques. En relocalisant la production d'énergie, elle peut transformer les relations de dépendance entre territoires et entraîner une réorganisation locale de la production de ressources. En particulier, les technologies renouvelables, souvent consommatrices d'espace, peuvent affecter les usages existants du sol ainsi que les industries et intérêts qui y sont liés. Or, ces dimensions territoriales sont rarement prises en compte par la recherche scientifique, qui peine à saisir comment l'autonomie énergétique reconfigure les structures de pouvoir entre les territoires et au sein de ceux-ci. Ces enjeux sont pourtant cruciaux pour des espaces situés à la périphérie des centres de pouvoir, tels que les juridictions insulaires infranationales (Sub-National Island Jurisdictions, SNIJs), où les questions d'autonomie politique et les luttes post-coloniales autour du foncier demeurent des sujets récurrents.

Le travail de terrain a été réalisé dans les deux îles en 2023. Les données recueillies comprennent des entretiens semi-directifs, des notes d'observation et une analyse documentaire. La thèse démontre que les infrastructures énergétiques exploitant des ressources renouvelables locales remettent en cause la structure territoriale héritée de la plantation. À La Réunion, l'implantation des énergies renouvelables entre en tension avec les usages existants du foncier et les acteurs qui en bénéficient, tandis qu'en Martinique, elle tend à profiter à ceux qui tirent déjà profit de la terre. Dans les deux cas, le développement des énergies locales offre toutefois aux acteurs territoriaux l'opportunité de renégocier les usages du sol et la répartition des bénéfices qui en découle. De plus, en réduisant la dépendance énergétique, la production locale d'énergie remet en question les dépendances structurelles qui relient ces îles à l'État et aux puissances économiques et industrielles. À l'inverse, le recours à la biomasse importée maintient ces relations de dépendance et écarte les enjeux fonciers du débat sur la transition énergétique. À travers ces résultats, la thèse démontre que l'autonomie énergétique ne relève pas seulement d'une question technique: c'est un problème territorial qui affecte les structures de pouvoir à différentes échelles. Comprendre les implications territoriales des diverses trajectoires de transition énergétique est essentiel pour identifier les futurs qu'elles dessinent, les rapports de pouvoir qu'elles perpétuent, ainsi que les formes d'action ou de résistance qu'elles suscitent.

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List of Acronyms

ASSAUPAMAR	*ASsociation pour la SAUvegarde du PAtrimoine MARtiniquais,* Association for the safeguarding of Martinican heritage
AFD	*Agence Française de Développement,* French development agency
CRE	*Commission de Régulation de L'Énergie,* French regulatory energy commission
CDPENAF	*Commission Départementale de Préservation des Espaces Naturels, Agricoles et Forestier,* Departmental commission for the preservation of natural, agricultural, and forest Areas
CTM	*Collectivité Territoriale de Martinique,* Territorial collectivity of Martinique
CSPE	*Charges ou Contributions au service public de l'électricité,* Public electricity service charges or contributions.
DEAL	*Direction de l'Environnement, de l'Aménagement et du Logement,* Directorate of environment, planning, and housing
EDF	Electricité de France
EDF-SEI	*Electricité de France-Système Énergétique Insulaires*, Insular energy system
EDF-PEI	*Electricité de France-Production Énergétique Insulaires*, Insular energy production
EU	European Union
GRESS	*Grand'Rivière Éolien Stockage Service,* Grand'Rivière wind storage service
IFER	*Imposition Forfaitaire des Entreprises de Réseaux,* Tax on network companies
OR	Outermost Regions of the European Union
PPE	*Programmation Pluriannuelle de l'Energie*, Pluri-annual energy planning
PV	Photovoltaics
PTME	*Plan Territorial de la Maîtrise de l'Energie,* Local planning for energy management
PLU	*Plan Local d'Urbanisme,* local urban plan
SARA	*Société anonyme de la raffinerie des Antilles,* Antilles refinery public limited company
SER	*Syndicat des énergies renouvelables*, Renewable energy trade association
SIDS	*Small Island Developing States*
SMEM	*Syndicat Mixte d'Electricité de la Martinique,* Inter-municipal authority for electricity
SNIJs	*Sub-National Island Jurisdictions*
STI	Socio-Technical Imaginaries
UAA	Used Agricultural Area
ZNIs	*Zones Non-Interconnectées,* Non-interconnected zones

Glossary

L'accise sur l'électricité is a tax levied on consumers'electricity bills to compensate energy operators for the extra costs they incur due to special provisions that ensure the quality of the public electricity service. These include extra expenses from the price equalization mechanism (see below), infrastructural investments, or the promotion of renewable energy through feed-in tariffs and calls for tenders (see below). This tax was previously called the *Contribution au Service Public de l'Électricité* (CSPE).

Agrivoltaics is the practice of combining agriculture and solar energy production on the same area. In terms of infrastructure, agrivoltaics can range from solar panels elevated above fields to allow crop cultivation underneath, to more dispersed or adjustable panel systems that provide partial shading, to ground-mounted arrays adapted for grazing livestock.

Bagasse is a byproduct of sugar production, consisting of the fibrous residue of crushed sugarcane. Bagasse can be used to generate energy through combustion, often in cogeneration systems that produce both electricity and steam for industrial processes. In Martinique and Reunion, bagasse is used to produce electricity and steam for sugar processing.

Békés is a term used in Martinique to refer to the population of white creoles, descended from plantation and slave owners and originally associated with fringes of the French nobility or small bourgeoisie. In Martinique, *Békés* are a small but influential community that has been able to retain economic power over the island. This socio-racial class is often discursively targeted during social upheavals.

Call for tenders or auctions calls are mechanisms used by governmental authorities to support the development of utility-scale renewable energy infrastructures, most often Photovoltaics. An auction call typically advertises a specific capacity to be developed in a particular region (e.g., 20 MW of solar in Martinique). Energy generators and project developers then bid on the call. Call winners, once they have installed their renewable energy production unit, can sell electricity at a guaranteed regulated price. In France, calls are issued by the Regulatory Commission for Energy (CRE).

Charges (ou Contribution) au service public de l'électricité (CSPE) refers to an ensemble of costs incurred by energy operators due to special provisions that ensure the quality of the public electricity service. These include extra expenses incurred by the price equalization mechanism (see below), infrastructural investments, or the promotion of renewable energy through feed-in tariffs and calls for tenders (see below). The acronym 'CSPE' was previously used to refer to the ***Contribution*** *au service public de l'électricité,* the tax levied on consumers to finance the price equalization mechanism (now called the *accise sur l'électricité*)

Departmentalisation refers to the 1946 change in status of the four 'old colonies' of France: Martinique, Guadeloupe, French Guiana, and Reunion—into departments. In principle, this granted them the same rights as any other French citizens, from which they had previously been excluded. This process represents a key historical moment. The term *departmentalisation* is often used to distinguish between the colonial times and the new, 'postcolonial', era and its challenges.

Feed-in tariffs refer to government-guaranteed prices at which electricity utilities purchase electricity generated from photovoltaic systems. These utilities are obligated to purchase this electricity.

Octroi de Mer is a tax levied by regional authorities in overseas regions on imported and local goods. Created in 1670 in Martinique and introduced in Reunion in 1850, it previously applied only to imported goods. This tax was extended to certain local goods to comply with the EU's internal market regulations. Nonetheless, the persistence of this tax rests on a derogation from EU law and is periodically criticized for inflating prices on the local market.

Overseas territories and overseas regions. The term 'overseas regions' is used across the dissertation to refer to places that hold the status of departments *and* regions of France. In contrast, the term overseas territories refers to all territories still attached to France, which include overseas regions but also other semi-autonomous entities (e.g., New Caledonia). These semi-autonomous entities remain part of France but generally hold greater local decision-making power.

Price equalization mechanism (*péréquation tarifaire*) redistributes the cost of electricity production over all producers to ensure that its prices remain similar across regions. For Martinique and Reunion, this system ensures that their relatively higher cost of electricity production is not passed on to consumers. This mechanism relies on a special tax (*accise sur l'électricité*, previously known as the CSPE) which is levied on consumers' electricity bill

Part I: Setting the Scene

1. Introduction

2025 marked a turning point for Reunion Island's energy transition: nearly 100% of its electricity is now powered by renewables. Soon, other French overseas regions will follow suit; Martinique, Guadeloupe, and Guiana are all on the way to convert their fossil-fuel production units to biomass, achieving their common legislative target of 100% renewable energy set for the 'horizon 2030'. Yet, this milestone is achieved at the expense of another target: energy autonomy. The reliance of these units on imported resources raises questions about how French overseas regions transitioned from a self-proclaimed and state-backed objective of energy autonomy to opting for a solution that brings them further away from achieving this goal. And what does it mean for former colonies, now regions, of France to seek energy autonomy in the first place? This dissertation begins with this conundrum to demonstrate that the pursuit of energy autonomy influences how and by whom certain places are controlled. In other words, the dissertation examines the relationship between energy autonomy and the organization of territorial power**.**

This paradox in French overseas regions resonates with wider debates on the different path that energy transition should take. The energy transition—the shift away from fossil fuel–based energy systems toward low-carbon alternatives—is both a global and a local process (Späth et al. 2022). There is a growing global consensus that the decarbonization of all energy sectors should mainly happen through their electrification, based on an electricity mix largely powered by wind and solar (Christophers 2025). Nonetheless, energy transitions unfold differently across space (Delina and Janetos 2018; Swilling et al. 2022; Späth et al. 2022;

Becker et al. 2016). This depends on local specificities, such as resource availability, political structures or decision-making capacities. Beyond these material and institutional factors, energy transitions are also ideal projects driven by normative visions of what future energy systems should look like (Ballo 2015; Benediktsson 2021; Chateau et al. 2021).

For some, the energy transition brings the opportunity to reorganize the structure of the energy system and, with it, some of its deficiencies, inequalities, and injustices (Burke and Stephens 2018; Becker and Naumann 2017). Visionary alternatives such as energy democracy, energy communities, or energy autonomy all make claims that extend beyond the energy system to question the role of the State, external influence, or global finance and capital interests (Becker and Naumann 2017). Among these alternatives, energy autonomy proposes that cities, countries, or even islands produce all the energy they consume. In the context of the energy transition, this closed system would be entirely based on locally available renewables (Juntunen and Martiskainen 2021). Energy autonomy could thus achieve two objectives at once: to decarbonize the energy sector while regaining control over the energy supply (Lopez et al. 2019).

Although primarily seen as a technical challenge, energy autonomy can actually affect power structures across scales. By shifting energy production at home, energy autonomy re-localizes the positive and negative externalities of energy production. Places pursuing energy autonomy face new questions, including what type of energy to produce, where to do so and potentially instead of what. These questions are especially relevant when energy autonomy is achieved through space-intensive renewables, such as solar and wind, which are often associated with land-use conflicts (Späth 2018; Calvert and Mabee 2015; Rule 2014; Avila-Calero 2018). Moreover, the pursuit of energy autonomy reduces reliance on imports and may reconfigure the political and economic ties linking sub-national entities, islands, and other global peripheries to the central powers upon which they depend.

French overseas regions and islands in general have historically been the stage of various territorial projects as colonizing powers attempted to control and shape these places to their benefit (Mountz 2015; Taglioni 2011). Historically, islands are global peripheries that have been imagined and transformed by external powers into prisons, laboratories, or plantations. In the context of the energy transition, they are often imagined as perfect laboratories to test energy technologies (Skjølsvold et al. 2020). This framing resonates with the historical experiences of islands and in particular of 'plantation islands' which were exploited for their resources and served as experimentation grounds for argi-industrial practices (Mintz 1986; Trouillot 2002b). These places still experience the legacies of the plantation system through their continued dependence upon external powers and the use and organization of their land and resources (Holstein 2014; Harrison and Popke 2018b).

As French 'plantations islands' evolved from colonies to departments of France, the extent to which they should be integrated within France or exert their autonomy has animated political debates. At the heart of such debates are territorial questions: what should be the relationship between these islands and France, who should control them, their resources, and the benefits that can be derived from them. In such contexts, advocating for energy autonomy is far from trivial. Energy systems are key instruments of territorial power; they give or restrict access to production capacities and basic amenities (Bridge et al. 2013). Those who control energy, therefore, yield significant power over those who do not. The energy transition trajectory that these places will take could thus impact their relationship with the State and the way they organize the use of their land and resources. In other words, whether plantation islands opt for an energy transition based on autonomy or dependency has territorial implications. It is a matter of who controls these places and how. Yet, the territorial stakes of energy transition trajectories are rarely addressed. When they are, existing investigations tend to focus on a single dimension of territoriality — either intra-territorial (within places) or inter-territorial

(between them) — and thus overlook how these two scales intersect. The dissertation contributes to existing research by conceptualizing energy autonomy as a territorial problem that spans multiple scales.

1.1. Research Questions

Based on the investigation of the French islands Martinique and Reunion, this dissertation investigates the relationship between energy autonomy and territoriality: the organization of control over space. To do so, the dissertation asks the following overarching question:

How does the pursuit of energy autonomy impact the territoriality of Martinique and Reunion?

This question aims to understand the impact of energy autonomy on how these islands are controlled and by whom. In particular, it seeks to identify the implications of energy autonomy on the territorial characteristics inherited from the plantation. These include the historical dependencies that span the electricity and agricultural sectors and the monocultural and unequal use of their land. Moreover, the dissertation contrasts energy autonomy with its alternative trajectory, which is to stay dependent on imported resources. As such, this question aims to provide an explanation for the current energy transition trajectory of Martinique, Reunion and other overseas regions as they further commit to imports to ensure their energy supply. To answer this overarching question, I ask three more questions which retrace both the ideal foundations of different energy transition trajectories and the material implications of pursuing energy autonomy.

1. How do imaginaries of the energy transition enable the reconfiguration of the territoriality of Martinique and Reunion?

This question examines the ideal aspects of energy autonomy and alternative trajectories by looking at how the energy transition is envisioned and what it is imagined to achieve for these

islands. This approach makes it possible to identify the territorial aspirations that enable or constrain different energy transition trajectories, and to assess how these trajectories shape the territoriality of Martinique and Reunion in material terms.

2. How does the pursuit of energy autonomy interact with existing land use and beneficiaries?

In Martinique and Reunion, energy autonomy primarily relies on the development of technologies that can produce electricity from locally available renewable resources (thereafter 'local renewables'). This question investigates the relationship between the uptake of local renewables and the existing uses and beneficiaries of the land. By this I mean what the land is used for (type of production, and for which purposes) and who can benefit from it, either directly through land ownership or indirectly by having access to the output of the land. For example, in the sugar cane sector, sugar industrials benefit from the land even when they do not hold property rights over it. Similarly, when landowners rent their land to solar developers to produce electricity, they both extract revenues from the land. This question aims to uncover the potential points of conflicts or synergies that local renewables can raise, and the extent to which they affect the intra-territorial relationships of Martinique and Reunion.

3. How are Martinique and Reunion's structural dependencies impacted by the pursuit of energy autonomy?

This question explores the inter-territorial relations that are reshuffled by energy autonomy. These are the structural dependencies that affect both their electricity and agricultural sectors and link them to external powers and to the State. Here again, the dissertation investigates the pursuit of energy autonomy through the implementation of local renewables.

1.2. Approach

1.2.1 Scope of the Dissertation

To answer the research questions, I focus on the decarbonization of electricity in Martinique and Reunion. To this date, energy transition efforts have largely focused on the decarbonization of electricity, as electrification is expected to contribute to the decarbonization of other sectors. Moreover, the dissertation takes a multi-sited approach by investigating the two cases of Martinique and Reunion. Rather than treating these islands as strictly comparable, the dissertation highlights both shared and unique dynamics found in each case to capture a broader range of territorial dimensions affected by energy autonomy. The choice of Martinique and Reunion as case studies is motivated by their value as research sites in their own right, and by the particular territorial specificities that make them relevant for studying energy transitions from a territorial lens. As Outermost Regions (ORs) of the European Union and Sub-National Islands Jurisdictions (SNIJs),[1] Martinique and Reunion are European and French peripheries, where questions of autonomy are intertwined with their colonial history. In both islands, struggles over local land use, persisting inequalities, and the nature of their relationship with the State are persistent points of political contention.

Despite their similarities, each island is also different. Reunion is often considered a pioneer in the energy transition, while Martinique is perceived more as a laggard, where renewable expansion faces more contestation. This reflects local particularities in each island and how they relate to the State, with Reunion leaning more towards integration than Martinique (Daniel and David 2021). Moreover, both islands differ in terms of their land-ownership structures, affecting differently who controls the land and benefits from it. As such,

[1] The term SNIJs is used to refer to any "non-sovereign populated island territory that possesses some degree of autonomy in a partnership with a parent state." (Eriksen et al. 2025, 1). This term contrasts with the more known terminology of Small Island Developing States (SIDS), which does not apply to the cases at hand as it refers to sovereign entities. Nonetheless, SIDS and SNIJ share similarities in terms of their smallness, colonial histories and the specific challenges associated with these characteristics.

Martinique and Reunion present two similar yet distinct cases to analyze the territorial implications of energy autonomy in a context where these questions are crucial.

1.2.2 Theoretical and Methodological Approach

I rely on an analytical framework that combines territorial theories with theories of socio-technical and spatial imaginaries. Together, these theories are helpful to analyze the underlying visions of different energy trajectories (imaginaries) the processes through which they are achieved and their impact (territorial lens). Using this framework, case studies are investigated based on a discursive approach. This means that I focus on how people *talk* about the energy transition and, in turn, which trajectories these framings enable or prevent. In other words, I link the words of the energy transition discourse to the reality they make possible.

In practice, I have conducted two field trips in Martinique and Reunion during which I conducted interviews, took part in workshops and events, and visited renewable energy development sites and infrastructures. The data collection focuses primarily on key stakeholders and actors that could directly or indirectly influence the energy transition trajectory of these islands. These include stakeholders from the energy sector (e.g., energy developers, local energy governance), farming and agriculture (farmers, governing bodies), or civil society organizations or opposition groups. The data collected during these trips, together with the analysis of secondary data (reports, media sources, maps, energy data,…) form the corpus of data upon which the dissertation is based. This corpus was analyzed using qualitative coding methods and put in perspective with the reality of renewable energy development in these islands. From this analysis, I derive the following key findings.

1.3. Main Findings

Based on the empirical work, the dissertation comes to the following conclusion: energy autonomy challenges the existing territorial forms inherited from the plantation, while

alternatives based on imports serve to maintain them. Energy autonomy, by advocating for the reduction of energy dependency, questions dependency relationships that extend beyond material considerations and the electricity sector. These are the financial, institutional, and sectoral axes of dependency that link these islands to the State and a few industrial actors. Moreover, by relocating energy production at home, energy autonomy also creates tensions over the legitimacy of existing land use and beneficiaries. The energy sector becomes intertwined with local land politics. This has the effect of slowing renewable energy uptake but also serves to interrogate the legacies of the plantation system.

Yet, local renewables are not sufficient in themselves to completely overturn the plantation structure as the development of local renewables sometimes benefits existing actors or fails to revert institutional and sectoral dependencies. Nonetheless, the implementation of local renewables offers the opportunity for local actors to re-negotiate how the land is used and to whose benefit. In contrast, the current strategy, which relies on importing biomass, keeps the dependency relationship between the State and these islands intact and maintains existing actors in place, without having to engage in land politics.

The territorial aspects of the energy transition, therefore, provide one explanation for Martinique and Reunion's current shift away from energy autonomy. By challenging the existing structures of control of these islands across scales, energy autonomy becomes a political proposition for territorial change. To avoid this change and still quickly decarbonize the electricity sector, imported biomass presents the optimal solution to the territorial problem posed by energy autonomy.

The study of Martinique and Reunion demonstrates that energy transition trajectories are the outcome of territorial struggles, shaped by competing projects that seek to control places and their resources. Energy autonomy, in this perspective, is best understood as a territorial process that challenges existing structures of control across scales. At the inter-territorial level

energy autonomy has implications over multiple axes of dependencies that link islands and other global peripheries to their center. Internally, energy autonomy must reckon with various aspects of land politics, including local debates over the legitimate use of the land and who should benefit from it. The interaction between territorial dynamics taking places within and between places is key to understanding the challenges of energy autonomy and the reasons for its success or failure.

1.4. Implications and Relevance

The conclusions are relevant both to understand the specific trajectories of Martinique and Reunion and, more broadly, the implications of alternatives to the existing energy system. In the case of Martinique and Reunion, the dissertation highlights the political stakes that underpin their energy transition. It shows that different trajectories are not neutral but participate in the realization of specific territorial projects. As such, it indicates that these islands' transition cannot be analyzed purely from a technical or micro-political stance, but from the perspective of the broader historical debates that are still animating these islands today.

The dissertation shows how energy autonomy can impact structures of power beyond the energy sector. By framing energy transition trajectories as the outcome of territorial struggles taking place across scales, it identifies the various dimensions that are being questioned by alternatives to the energy system like energy autonomy. As such, it provides ways to understand both when they fail to take place and when they overstate their transformative power. In the case at hand, energy autonomy ambitions may fall short on their promise when their implementation replicates the logic of the existing system. As such, the dissertation provides a grounded analysis of how these alternatives *are envisioned* and *what they actually do.* This is crucial for identifying the energy futures we are being offered, understanding how we can get there, and potentially thinking beyond them.

1.5. Overview of the Dissertation

The rest of the dissertation is organized around four main parts. **Part I** situates this work within existing research, outlines the theoretical and methodological approach of and gives a detailed presentation of the case studies. After the introduction (this chapter), **Chapter 2** reviews existing work on the interconnection between energy, space and power. I then discuss alternatives to the existing energy system, including energy autonomy. This is followed by a review of scientific work on energy transitions on islands and the parallelism that can be drawn between energy transitions and plantations. This review is followed by the presentation of the analytical framework. I further clarify what I mean by territory and introduce concepts of territoriality, territorialization, and frontiers, and how they can be used to understand energy transition processes. This section also introduces socio-technical imaginaries and spatial imaginaries as key analytical tools to study energy transitions and territorial change. Lastly, I formulate the concept of 'territoriality of the plantation', used throughout the dissertation to assess the impact of energy transition trajectories on territorial forms inherited from the plantations.

Chapter 3 describes the research design. It first introduces the case study approach and discusses what it means to take a discursive stance to empirical research. I present and justify the specific methods used during and around the fieldwork, namely interviews, observation, and document analysis. I further outline how the data collected was analyzed. The second section of the chapter focuses on the steps undertaken to establish the findings of each empirical chapter. Finally, I reflect on my epistemological stance and positionality in the context of this project. Throughout, I discuss the limitations of the research design.

Finally, **in Chapter 4,** I present in detail the two case studies through an analysis of their territoriality over time. I outline how they transitioned from colonies to Departments of France before acquiring their current unique territorial status. I then discuss key debates and

structural issues that animate both islands today. Finally, the chapter presents the different energy systems of Martinique and Reunion, how they have evolved, and how they compare to other ORs. Throughout the chapter, I identify which aspects of the territoriality of the plantation have survived in these cases and continues to shape both agricultural land use and the configuration of the energy system.

With **Part II,** I dive into the first empirical section of the dissertation. Titled "The Islands and France", it focuses on the relation between Martinique and Reunion with the State in the context of the energy transition. **Chapter 5** analyzes the energy transition discourse, the imaginaries that populate it, and the territorial projects advocated through it. In doing so, it establishes the relations between different trajectories and their implications for the relationship between these islands and the State and the relationship of dependencies that links them.

In **Part III**, "The Islands and their Land", I examine the implications of the transition at the intra-island level, focusing on the impact of renewables on land use and beneficiaries. Part 3 consists of two chapters, each examining one island and focusing on either the dimension of land use or land beneficiaries. **Chapter 6** looks at the development of solar installations that combine agricultural production, known as agrivoltaics, in Reunion. I provide an analysis of how actors across the energy and agricultural sectors negotiate these structures, and how they relate to questions of what should be produced on the land. In **Chapter 7,** I investigate the negotiation of wind and solar installations in Martinique and their impact on who benefits from the land and from the electricity market. Both Chapters also ultimately address the ways in which local renewables reconfigure Martinique and Reunion's dependencies.

Finally, **Part IV** brings together the findings of each empirical chapter and reflects on their implications both for the case studies and beyond. In **Chapter 8**, I analyze how each energy transition trajectory influences the territoriality of the plantation. This analysis provides an

explanation for the original puzzle of the dissertation: to explain why Martinique and Reunion have chosen the path of energy dependency over autonomy. These findings are significant for understanding the territorial aspects of energy alternatives, particularly energy autonomy. Building on this, I make a conceptual contribution by identifying the key territorial dimensions of energy autonomy. Finally, **Chapter 9** summarizes the dissertation and concludes with a discussion on how Martinique, Reunion and other territories could harness the transformative potential of energy transitions.

2. Literature Review and Analytical Framework

This chapter is divided into two main sections. In the first section, I review the existing literature that has approached energy and energy transitions from the lens of power and space. In doing so, I also present existing research on energy autonomy and sovereignty**.** The section then discusses renewable energy transitions and energy autonomy in islands. Next, it reviews the literature on the relationship between plantations and energy. It then outlines the existing literature on Martinique and Reunion's energy transition. I conclude that while existing literature has substantially reviewed the relationship between energy, space and power, energy autonomy has not been conceptualized as a fundamentally territorial phenomenon; one that can substantially rework structures of power across space and scale. In the second section, I present the analytical framework used in the dissertation. I outline what I mean by territory, territoriality, and territorialization, and how I combine these concepts with theories on imaginaries. Finally, the chapter formalizes the concept of the *territoriality of the plantation*, used throughout the dissertation.

2.1. Literature Review

2.1.1 Energy, Power and Alternative Energy Systems

Scholars who study the intersection of energy systems from a socio-political perspective argue that they reflect power structures (Huber 2009; Mitchell 2011; Harvey 2003; Burke and Stephens 2018). Three main relationships between energy and power can be drawn. First, energy systems are historically situated and reflect political ideologies around the nature, use and role of energy (Daggett 2019; Huber 2009). Second, the resources that power the energy system can influence modes of governance and support or undermine certain configurations of power (Mitchell 2011). Finally, controlling energy yields power beyond the energy system (Mitchell 2011; Huber 2009).

Analyses of the power relations that underpin energy system show that fossils fuels have favored a top-down, centralized governance, with very few actors operating and generating profits from the energy system (Christophers 2025; Burke and Stephens 2018). This is partly due to the concentrated nature of fossils fuels, with few extraction and production zones. In contrast, wind and solar power are much more spread out geographically and more easily harnessed. The relative decentralization and wider availability of renewables gave rise to the idea that renewables could and should contribute to a more democratic, locally owned, and even just energy system and society altogether (Burke and Stephens 2018). Such claims are part of a wider debate over the alternative energy systems that the energy transition will or should bring (Becker and Naumann 2017). Together, concepts and initiatives such as energy democracy, energy communities, energy justice or energy autonomy generally criticize an economic and political model based on dependency on the state and/or the interest of capital. They advocate for the re-empowerment of the public over the energy system, albeit at different scales (Burke and Stephens 2018; Becker and Naumann 2017).

Among these alternatives, we find claims for energy autonomy and energy sovereignty (Burke and Stephens 2018). Energy autonomy can be defined as:

> "the ability of an energy system to be fully functional through its own local production, storage, and distribution systems while simultaneously fostering local environmental and social goals" (Juntunen and Martiskainen 2021, 1).

Energy autonomy is best understood as both a normative objective and a technical benchmark. At the technical level, energy autonomy refers to an energy system that is self-sufficient, with a single unit (building, community, region, state) producing the energy it consumes. A village is energy autonomous if the energy consumed by its residents is produced within the village, through solar panels, heat pumps etc. Yet, it remains unclear when a unit can truly be considered energy autonomous, what qualifies as locally produced energy, and how much self-sufficiency is realistically achievable. Energy autonomy is therefore best

understood as a relative notion, an aspiration toward greater self-sufficiency rather than an absolute state. But why strive for energy autonomy in the first place?

At the normative level, energy autonomy is motivated by environmental, social and political aspirations (Juntunen and Martiskainen 2021). From an environmental perspective, energy autonomy, when based on renewable energy, contributes to climate mitigation efforts. At the social level, energy autonomy is meant to bring potentially cheaper and more accessible energy to consumers or 'energy citizens' with varying degrees of social impacts (Juntunen and Martiskainen 2021). Energy autonomy is also seen as a means for individuals, communities or even regions and states to gain agency over their energy needs and to be empowered by it (Lopez et al. 2019; Scheer 2012). As such, energy autonomy also proposes a political agenda which aims at reducing 'external' influence, or dependency, over a basic necessity: energy (Lopez et al. 2019). One of the key motivations for energy autonomy is to gain independence from markets, global value chains, geopolitical events or external powers (Juntunen and Martiskainen 2021; Stefanelli et al. 2019; Yalçın-Riollet et al. 2014; Engelken et al. 2016). As such, energy autonomy can also be a means to obtain energy sovereignty.

Energy sovereignty concerns the necessity to regain power over the energy system. It generally extends beyond the local production of energy to emphasize issues of control and independence. Two strands of energy sovereignty co-exist. One is grounded in grassroots movements, closely tied to food sovereignty, indigenous struggles, and anti-colonial resistance. It emphasizes local control, autonomy, and justice. Energy sovereignty is here a social and political project, originating in South-America in connection to the food sovereignty movement (Andreucci et al. 2025). This stream of energy sovereignty focuses primarily on the study of indigenous communities, highlighting the connection between energy sovereignty, self-determination and territorial claims (Santos and Larissa 2023; Raimi and Davicino 2024; Rezaei and and Dowlatabadi 2016; Avila-Calero 2017). In contrast, the

other conceptualization of energy sovereignty considers energy as a matter of state or regional sovereignty closely linked to issues of energy security, control over resources, and geopolitical independence (Torres and Niewöhner 2023; LaBelle 2024; Thaler and Hofmann 2022; Proedrou 2023).

Energy alternatives, such as energy democracy or energy autonomy, can therefore become the ground for political change. Yet, while wind and solar offer more opportunities to reorganize power, it does not mean that it will eventually do so. Recent research shows that the materiality of renewable energy is increasingly made to fit the existing energy systems, failing to substantially reorganize power structures around it (Avila-Calero 2025). Energy autonomy does not translate into one normative vision but "can be promoted by members of a gated community of white supremacists or by developers exposed to real estate speculation as well as by groups of degrowth activists in rural areas." (Lopez et al. 2019, 24). As such, energy autonomy or energy sovereignty is not a political agenda in itself but can be a tool towards achieving various political ideologies. The extent to which renewable energy challenges existing power relations, therefore, will depend on how the new energy system is designed (Szeman and Wellum 2022).

Nonetheless, such discussions point to the political necessity of questioning the structure of energy systems that the energy transition will eventually (re)create. The renewable energy transition does present a crucial opportunity, if taken, to renegotiate the fundamental structure of energy systems and the power regimes they support. As such, it is relevant to analyze the renewable energy transition as a political struggle where multiple projects compete to maintain or re-arrange structures of power. These projects, as will be argued in the next section, are grounded in and negotiated through space.

2.1.2 Energy, Space and Power

Since the mid-2010s, energy studies have witnessed a 'spatial turn' as researchers have increasingly investigated the spatiality of energy systems through the lens of geographical concepts such as space, place, landscape, scale or territory (Baka and Vaishnava 2020; Bridge 2018; Calvert 2016). Space matters to understand energy systems, not just because energy infrastructures are located in space, but also because they impact broader spatial relations of center and peripheries, uneven development, and other socially relevant spatial differences (Bridge 2018). For energy geographers, energy systems are determined by the spatial set-up in which they unfold, but also modify the landscape and spatial relations around them (Castán Broto et al. 2018; Bridge et al. 2013).

The renewed interest in the geographies of energy has generally been prompted by the energy transition and its range of spatial implications. These include, for example, the relocation of energy production units as renewable energy capacities are developed or the transformations of regions affected by the phase-out of fossil fuels. As the next section will show, a significant amount of research has focused on the changes resulting from the relative land intensity of renewables. The extraction of fossil fuels is subterranean and, as such, removed from people's everyday life and less associated with land politics than wind, solar, or biomass, which essentially bring energy extraction above ground (Huber and McCarthy 2017).

Local opposition to renewables and their impacts on existing land use and livelihoods is well documented across the literature (Devine-Wright 2009; Batel and Rudolph 2021; Stock and Birkenholtz 2021). The development of renewable infrastructures can contribute to reinforcing existing spatial inequalities and uneven development as rural areas and peripheries are mobilized to produce the bulk of the energy supply for its consumption elsewhere (Golubchikov and O'Sullivan 2020; Dunlap 2020; Sánchez Contreras et al. 2023; Batel 2021; Siamanta 2019; Argenti and Knight 2015). Uneven development, dispossession, and

accumulation increasingly appear as features of the renewable energy transition as already marginalized places serve as 'sacrifice zones' for the energy transition, enforcing or creating new inequalities and oppressions (Brock et al. 2021). Renewable energy transitions can reinforce existing political peripheries when they come to be:

> "systematically disadvantaged through the whole energy system due to their inferior position within the asymmetrical spatial distribution of material, economic, political and symbolic resources and capabilities" (Golubchikov and O'Sullivan 2020, 1).

Nonetheless, energy transitions can be used by marginalized communities and places to enter energy debates (McEwan 2017). Walker (2022) demonstrates that renewables' need for land can empower peripheral regions, inverting the traditional balance of power between centers and peripheries. As such, the spatiality of energy transitions can create opportunities to unsettle existing power relations, even as they may also reinforce them. Indeed, like energy, space is the source and object of economic, social, and political power (Soja 2013; Lefebvre et al. 1991; Massey 2005). Hence, the spatiality of energy can impact or reflect power structures. The relation between space, power, and energy is best encapsulated by territorial analyses of energy systems.

Territories are conceived as 'political technologies' which order space according to political and economic goals, enabling the control of specific areas (Elden 2013; Hommes et al. 2022). For (Bridge 2018, 17), talking about territories in the context of energy systems refers to their:

> "connectivity and integration across space as well as their boundedness and separation, and acknowledges that territorial form is not a given but an area of strategy in which, at any one time, several alternative territorial formations in play." (Bridge 2018, 17).

By emphasizing the strategic intent behind the spatial organization of energy systems, Bridge (2018) points to their political and contested nature. How energy grids are structured or where energy is produced is, in this sense, not only contingent upon physical factors (e.g., location of wind potential) but also political projects (e.g., leveraging geopolitical influence, development policies, regional integration).

Recent contributions have also discussed the connection between the energy transitions and territorial power. McEwan (2017) outlines how zoning and partitioning is used strategically to foster renewable energy development in specific places. Singh (2022) shows how some places are reframed as 'wasteland' in order to legitimize solar development. Finally, Ducastel (2024) analyzes the territorial strategies deployed by electricity industrials in Guadeloupe to secure financial and natural resources.

Energy autonomy and sovereignty have also been researched from a territorial lens. Walker (2022) highlights that the territorial borders of cities strongly limit their energy autonomy, which then have to rely on rural areas outside of their jurisdiction. Others discuss control over energy resources as a prerequisite of territorial power, threatening the sovereignty of the state when missing (LaBelle 2023; Vajda et al. 2023). Territorial approaches are more common in energy sovereignty literature that focuses on the energy initiatives of marginalized places and indigenous communities. Territoriality here is also expressed through questions of land access and rights. Historical land dispossession and land fragmentation can considerably limit energy sovereignty (Fan 2024; Raimi and Davicino 2024). In addition, renewable energy projects can generate new forms of land grabs or internal colonization (Andreucci et al. 2025; Avila-Calero 2017). Yet, renewable energy projects can also contribute to the protection of territorial rights over the land (Santos and Larissa 2023).

This focus on land is largely missing from the energy autonomy literature, despite the land-intensive nature of renewables and associated land use conflicts (McCarthy 2025). Kim, Burnett, and Ghimire (2015) and Russeil et al. (2023) account for the tradeoff between land use and energy autonomy's impact on food production, integrating land as a variable in scenario modelling. Yet, such contributions do not further investigate the political aspect of land use change that accompanies energy autonomy initiatives. Land, however, beyond being

a critical resource for renewable energy development, is also central to territorial struggles over who controls and benefits from the land and its resources.

The existing literature has adequately established the connection between space, energy, and power and the relevance of such a connection in the context of energy transitions. Works on energy sovereignty movements link issues of territorial sovereignty and self-determination with control over energy. Yet, existing investigation focuses only on either the intra or inter-territorial scales and fails to address how they intersect. Moreover, energy autonomy literature does not sufficiently account for the territorial implications of energy autonomy, specifically concerning its interconnection with land use and land politics. In particular, despite the range of works dealing with energy autonomy in insular territories, there is a lack of engagement with the territorial implications of such an agenda in places that share a history of external control and peripheralization.

2.1.3 Energy Transitions, Islands and Plantations

2.1.3.1. Islands and the Energy Transition

Islands'energy systems are often characterized by a situation of fossil fuel energy dependency, meaning that they significantly import the fossil fuels energy they consume, subjecting them to high cost of energy production, volatile prices and supply disruption (Lee et al. 2020; Tsagkari and Jusmet 2020; Kuang et al. 2016; Rae and Bradley 2012). In the context of the energy transition, shifting to local renewable resources could therefore have the dual positive effect of decarbonizing the energy sector while gaining greater energy security through energy autonomy.

Several contributions assess renewable energy uptake and energy autonomy in islands and the challenges they face (François et al. 2023; Bertin and Frangi 2013; Kaldellis et al. 2012; Kim et al. 2015; Lee et al. 2020; Tellarini and Gram-Hanssen 2024; Katsaprakakis and

Voumvoulakis 2018; Diaf et al. 2008; Barone et al. 2021; Petrakopoulou 2017; Sawatzky and Albrecht 2017). The most common difficulty faced by small islands when integrating renewable energy infrastructure relates to their relative isolation, as many are poorly or not at all connected to an external grid, which affects the overall stability of the electricity supply (Tsagkari and Jusmet 2020; Kuang et al. 2016). Intermittent renewable energy, such as wind and solar, presents a challenge to these grids by introducing variations that cannot be compensated for by energy produced elsewhere. A second issue concerns the physical geography of islands, which can complicate renewable energy integration due to limited land, rugged terrain, or the unsuitability of energy infrastructure for local conditions (Russeil et al. 2023; Handique, Peer, and Haas 2024; Schallenberg-Rodríguez and García Montesdeoca 2018).

Despite these limitations and sometimes because of these characteristics, energy researchers, developers or policy makers often frame islands as perfect locations for the energy transition (Zafeiratou and Spataru 2018; Ioannidis et al. 2019; Riva Sanseverino et al. 2014; Skjølsvold et al. 2020). Denouncing this tendency, other energy or island studies scholars have identified the relationship between such framings and historical representations of islands (Skjølsvold et al. 2020; Harrison and Popke 2018a; Mela 2023; Gugganig and Klimburg-Witjes 2021).

Islands are often the object of strong imaginaries and quick associations, framing islands as exceptional places. Those are often paradoxical: They are paradisiac tourists' destinations and prisons, they have rich ecosystems and cultures but are also dependent, backward, and deficient (Baldacchino 2007; Hau'ofa 1994). Islands are, in Baldacchino's words, "both heaven and hell" (Baldacchino 2007, 5). Those paradoxical conceptualizations are linked to colonial legacies and Western or imperialist imaginations, which frame islands as sites of exoticism and conquest (Gugganig and Klimburg-Witjes 2021; Baldacchino 2007; 2012; 2005). Powerful imaginations linked to the physical characteristics of islands as small,

enclosed, controllable environments have historically attracted scientific research and technology development on islands (Gugganig and Klimburg-Witjes 2021; Baldacchino 2012; Bocci 2020). Islands are seen as "potential laboratories for any conceivable and uninhibited human project", implying the imposition of external projects upon local populations and environments (Baldacchino 2007, 7).

Skjølsvold, Ryghaug, and Throndsen (2020) find that these imaginaries are mobilized in a set of European-funded energy transition projects in islands. The authors show that energy actors and innovators tend to envision islands as having a distinct 'socio-materiality', making them particularly suited for the renewable energy transition. This socio-materiality combines a range of characteristics such as smallness, isolation, or strong community ties, conducive to the testing of energy technologies and their scalability in mainland settings. This is reflexive of the vision of islands as microcosms of society that:

> "leads to a paradoxical and simultaneous position in discussions about up-scaling, where generic qualities point towards the potential of easily transferring solutions from island to mainland, but where notions of specificity suggest that this will be difficult."(Skjølsvold et al. 2020, 2).

Beyond such contradictions, the laboratory narrative is also ethically problematic. If islands are 'open air laboratories', their inhabitants easily become guinea pigs and their territories open to any alterations. Experiments can, after all, fail and do not preclude difficulties in achieving "ecotopias" (Fletcher et al. 2020). Islanders in this scenario are abstracted or romanticized. They are the "objects of the gaze" of external actors and are stripped of agency, denied nuances (Baldacchino 2007, 2). Such outsider perspectives may be of little relevance for islanders (Nimführ and Meloni 2021; Baldacchino 2007) and reduce to general claims the diversity of island geographies and cultures (Baldacchino 2005). Nonetheless, Island authorities often rely on the 'laboratory island' trope to position their territories as environmental hubs and attract investments (Grydehøj and Kelman 2017; Harrison and Popke

2018a; Skjølsvold et al. 2020; Fletcher et al. 2020; Roche et al. 2018). In doing so, islands run the risk of only developing symbolic projects that fail to reliably or substantially contribute to their environmental ambitions (Grydehøj and Kelman 2017; Harrison and Popke 2018a).

Still, the local mobilization of island imaginaries cannot be reduced solely to a marketing exercise relying on the laboratory trope. Mela (2023) shows how island valorize their historical heritage and islandness in the context of the energy transition. Focusing here on European islands north and south of the continent, she finds that energy transition narratives often mobilize ideas around islands' history of autarky, innovation, or exploitation and peripheralization to argue for or against renewable energy projects. Her analysis indicates that islands'isolation is emphasized over their history of connection, therefore setting the path forward towards energy transitions based on autonomy rather than interconnectivity.

Despite contributions that highlight the imaginaries that underpin energy transition on islands, existing research has yet to account for the relationship between these imaginaries and the territorial history and future of islands. Autonomy ideals are actually unsurprising given islands' relative dependency, in material but also political and economic terms. Indeed, 'small islands' often share a history of external control, colonization, and exploitation, which have placed them in a state of continuous dependency on securing basic necessities (Taglioni 2011; Mountz 2015). In particular, former colonies and 'plantation islands' were built upon a system that dedicated land for the production of the colonizing centers, only to import basic necessities from the same land (Ferdinand 2022; Chivallon 1998).

Today, as islands have either been integrated into their colonizing state or have become independent, dependency relationships are often maintained. Harrison and Popke (2018) show that the legacies of the plantation system continue to shape the energy sector of Caribbean islands through their reliance on fossil fuel imports and foreign interference. Similarly, when examining the financial transfers that power the electricity sector between France and

Guadeloupe, Ducastel (2024) argues that these reinforce the island's dependency on the State. Renewable energy, therefore, presents an opportunity to break from foreign control and to regain sovereignty over their energy system (Harrison and Popke 2018b; Ducastel 2024).

Yet, renewable energy does not necessarily involve breaking away from colonial structures. Renewable energy can be perceived as another foreign interference, or 'internal colonization' (Osti 2018; Argenti and Knight 2015; Siamanta 2019; Andreucci et al. 2025). As discussed in the previous section, the energy system may be renewable, without automatically changing the structure of power it upholds. Moreover, the deployment of space-intensive renewables has to account for the existing land use, ownership, and the distribution of resources in contexts where land is strongly marked by colonial legacies. Who owns the land and for what purposes are central to sovereignty considerations, particularly in plantation islands.

2.1.3.2. Plantation Islands and the Plantation-Energy Nexus

Islands have often found themselves at the center of attempts by external powers to seize, control and shape them to materialize their imagined projects (Mountz 2015; Steinberg 2005). The history of islands is indeed marked by a common experience of foreign control and colonization, used as a naval and geopolitical outpost or an agro-industrial reserve. The latter essentially took the shape of plantations as islands with tropical qualities were colonized and transformed into plantations.

Plantations established a particular spatial organization of the land and relations between colonized islands and their metropolis. At the island level, plantations cleared existing ecosystems and organized the land around the cultivation of homogenous crops such as sugar cane (Holstein et al. 2024; Trouillot 2002a; Chivallon 2004). Local food production was restricted to elevated and less fertile terrains or 'Creole Gardens'. This system implied a systematic dependence on imports for subsistence (Chivallon 2004; Roinsard 2014; Benoist

1983). The plantation system was grounded upon a social organization structured around a socio-racial hierarchy of work and life, as the work in plantations was ensured by enslaved and indentured persons (Ferdinand 2022; Roinsard 2014). Beyond their material effects, plantations served as a vehicle for the diffusion of Western imaginaries of modernity and progress, limiting local imaginaries to those of the colonizing state (Trouillot 2002b). Plantations, their particular socio-spatial organization, and the logic they rely on have been theorized and used as a conceptual tool by several scholars.

Ferdinand (2022), expanding from previous contributions on the Plantationocene, theorized the plantation systems from the analysis of the *habitat colonial* or the colonial inhabitation structuring plantation islands. Ferdinand argues that this system established "particular way of inhabiting the Earth" (Ferdinand 2022, 26) based around geographical and ontological dependence, the exploitation of non-humans (nature) and the exploitation of an 'other' (racialized humans) (Ferdinand 2022). This way of inhabiting, he argues, served as a foundation for the way we still inhabit the world today.

The territorial organization of the plantation has also been conceptualized as instrumental in the making of modernity, industrialization, and ultimately, capitalism. For authors such as Trouillot (2002b) and Mintz (1986), as well as energy scholars like Mitchell (2011) and Boyer (2023), plantations played a crucial role in feeding the industrial revolution in Europe and developing the logic instrumental to its success. For Trouillot (2002b), plantations were essential for the construction of a Western imaginary of an 'other' and of itself as a model for progress. For Mitchell (2011) and Mintz (1986), plantations also literally fed the industrial revolution, its workers (sugar) and factories (raw materials). Building from this work, Boyer (2023) argues that sugar plantations installed a system of power intensification, provided mainly by slave labor, precluding the very logic of industrialization and of the use of fossil fuels, itself a highly concentrated form of energy.

In the context of the energy transition, plantations have been used as an analogy by Stock (2022) to describe large-scale renewable energy projects. In his work on solar development in India, the author considers that solar parks can be seen as 'energy plantations' insofar as they re-enact the "idealized and racialized reordering of nature, economy and society" of colonial plantations, albeit in the name of sustainability. Finally, Harrison and Popke (2018b) discuss the persistence of plantation imaginaries in Caribbean islands, which prevents the re-imagination of an energy system that would not be dependent on external resources or powers.

The theorization of plantations has three relevant implications for the study at hand. First, it demonstrates the power of the plantations beyond a specific geo-temporal point and how it can be applied to understand energy systems. Second, it recenters places where plantation systems were first developed as crucial places to understand contemporary development (Ferdinand 2022).[2] They offer an alternative perspective on narratives of global development by highlighting their destructive origin. Third, the theorization of plantations is helpful to study post-colonial islands not only from the perspective of their colonial history but through the inherited logics of plantations as a way of conceptualizing and dividing the world. 'Plantation islands' such as Martinique and Reunion are places where the consequences of the plantations as a 'way of inhabiting' can most directly be felt, through their socio-spatial organization, both locally and in relation to external powers. This also impacts how we look at energy autonomy targets in these places, as they contradict the dependency logics of the plantations and may reshuffle existing land uses. The challenge posed by the objective of

[2] Thinking of plantations islands as places fit for the extraction of more generalizable knowledge runs the risk of further entrenching islands as places of experimentation, essentializing the diverse experience of these places. The approach advocated by Ferdinand, when talking in particular of the field of ecology, is not to consider them as places of experimentation but "as a scene of ecological thinking", where the intertwined crises of colonial domination and ecological destruction are the most visible (Ferdinand 2022, 13).

energy autonomy to the legacies of the plantations is, however, missing from the current literature on the energy transition in Martinique and Reunion.

2.1.3.3. Energy Transition Research in Martinique and Reunion

Few studies have examined the energy transition in Martinique, Reunion, and other French overseas regions. Current research often investigates single case studies, with some exceptions (Roche et al. 2018; Roche 2018). In Martinique, research that examines single energy technologies focuses exclusively on ocean thermal technologies (Devault and Péné-Annette 2017; Roche 2018). Other contributions usually study the energy transition of the electricity sector through an analysis of the institutional framework or stakeholders involved (Ory 2020; Yoann Pelis 2000). The energy transition in Reunion has been researched mostly by researchers from Reunion University, which has a specific unit dedicated to energy innovations. As such, part of the research on energy transition is technical and focused on scenario modelling and developing solutions, but nonetheless with a commitment to interdisciplinarity (Praene et al. 2012; Bénard-Sora and Praene 2018; Bao et al. 2022) This type of work coexists with economic assessments of the transition (Selosse et al. 2018a; Sabine et al. 2020). More recently, Russeil et al. (2023) looked at the interdependencies between energy and food sectors to assess the feasibility of local energy and food sufficiency targets.

From research available on other French overseas regions, the work by Ducastel (2024) and Rivière and Ducastel (2024) in Guadeloupe identifies struggles between industrial actors that arise from the French regulatory context over the electricity market, applicable to the case studies at hand. Finally, recent analysis of the energy transition in French Guiana have covered the political and colonial aspects of the energy transition (Baumes et al. 2024; Crézé 2024). These contributions reveal that the energy transition and the pursuit of energy autonomy are inextricably linked to ongoing struggles over decolonization. In the case of

French Guiana, these struggles often oppose indigenous communities' relationship with the land to developmentalist agendas promoted by Creole political elites seeking greater political autonomy through material and economic means (Baumes et al. 2024; Crézé 2024).

A series of key insights can be drawn from existing research. First, the deployment of renewables in Martinique and Reunion and overseas regions is constrained by other land uses, most predominantly on agricultural land (Ory 2020; Russeil et al. 2023; Crézé 2024). Second, energy regulation is transitioning from a state-centered competence to one shared with local regional actors. This generates friction as new actors, including new energy providers, enter the negotiation (Ory 2020; Sawatzky and Albrecht 2017; Roche et al. 2018; Rivière and and Ducastel 2024). Despite gradually allowing for the inclusion of local actors, energy governance remains heavily centralized, leaving little room for local perspectives to be heard (Sawatzky and Albrecht 2017; Roche et al. 2018; Ory 2020). Third, initial strategies for the energy transition in Martinique and Reunion relied on the development of energy technologies, including ocean thermal technology (Roche 2018; Devault and Péné-Annette 2017). Finally, existing investigation of French Guiana's transition suggest the that pursuit of energy autonomy through local renewables can overlap with political tensions over political autonomy and how it should be achieved.

Despite these contributions, the literature on the energy transition in Martinique and Reunion still has to address the political implications of energy transition for these islands, in particular in relation to the energy autonomy ambition. While existing research highlights key tensions between incumbent (fossil fuel producers, the State) and new actors (regional authorities, energy developers), it fails to interrogate where these frictions come from and the broader role that the energy transition can play in achieving other objectives beyond climate change mitigation.

2.1.4 A Summary of Existing Research and Gaps

The literature review shows that renewable energy transitions have the potential to challenge, modify or reinforce existing power structures. The power of energy systems is reflected and shaped by spatial relations, creating places of connection and disconnection, centers and peripheries. While islands have been framed as key places to experiment and test energy technologies, renewable energy could also contribute to reducing the relationship of dependencies inherited from the plantation system. Energy autonomy, while being first a material consideration, can therefore have political implications affecting both these islands' relationship with external powers and local land use politics. As such, energy autonomy has territorial implications that also include access to land and its resources.

Plantation islands are prime sites to study energy transition processes, not because of inherent qualities attached to their insularity, but rather because of their common experience of peripheralization and dependency. Such experiences are useful to apprehend how energy transition, power, and space are intertwined with the political stakes of energy autonomy. This involves the study of the ideas, visions or 'imaginaries' that shape the energy transition in these places. Further, to consider plantation islands'energy transition trajectories, it is important to investigate how, not only if, renewable energy technologies are deployed and which territorial agenda they support or challenge. In the next section, I describe the analytical framework guiding this investigation.

2.2. Analytical Framework

I primarily draw on territorial theory together with concepts from spatial and socio-technical imaginaries. In this section, I explore what these concepts mean, how I combine them and their relevance for energy transition research.

2.2.1 Territories, Territoriality and Territorialization

There exists more than one definition and theoretical understanding of territories. I refer here to the Anglo-Saxon tradition that differs, but overlaps with French and Latin-American conceptualizations (Pachoud et al. 2022; Dorn and Hafner 2023). In this work, I used the definition offered by Halvorsen (2019) as "the appropriation of space in pursuit of political projects" (Halvorsen, 2019, p. 790). The notion of **territory** is a "distinct mode of social/spatial organization" which conceives space as something to be "owned, distributed, mapped, calculated, bordered and controlled" (Elden 2010, 810). The geographical organization around territories is a social construct, a political idea tied to modernity and diffused by colonial coercion (Halvorsen 2019; Kearns 2018; Elden 2013). Yet, it "cannot be isolated from, nor reduced to, the birth of the modern state" (Halvorsen 2019, 795). It has been re-appropriated to suit a multiplicity of political projects, both of coercive and emancipatory nature, and along various forms of territoriality (Halvorsen 2019).

Territoriality refers to the system and the mechanisms through which control is exerted over an area, its people, and resources (Shattuck and Peluso 2021). This understanding is inspired by Sack's definition of territoriality as:

> "the attempt to affect, influence, or control actions and interactions (of people, things, and relationships) by asserting and attempting to enforce control over a geographic area" (Sack, 1986, 55).

2.2.1.1. Control Over What? Resources as the Object of Territoriality

The object of control can apply to various social relations across place and scale, insofar as it takes place through the control over a geographical area (Sack 1986). Given its almost inextricable relation with the land, resource control is one of the key relations often studied through the lens of territoriality (Correia 2019; Rasmussen and Lund 2018; Vandergeest and Peluso 1995; Woods 2019). Resources are understood as 'things' through which, once granted access, one can capture benefits (Ribot and Peluso 2003). These include land and its

extractive and productive potential, from agricultural outputs to electricity. Resource control is both the objective of territoriality and a means through which control over populations and places is enforced (Lund 2016). It is therefore both the object and a mechanism of territorialization.

2.2.1.2. Establishing Territoriality: Frontiers and Territorialization

Territorialization refers to the "process by which a specific geographic area comes to be understood, recognized, claimed and controlled" (Shattuck and Peluso, 2021, 197). The tools of territorialization include but go beyond classification and boundary making: it is a "cultural and social practice" exerted through "violence, communication, administration, enclosure, dwelling, movement and imagination" (Shattuck and Peluso 2021, 197). The ability to territorialize is often associated with the nation-state and expressed through sovereign power (Clare et al. 2018). However, non-state actors can also territorialize: the extent to which they do so is constrained by their relative realm of influence and underlying power structures (Sassen 2013; Rasmussen and Lund 2018; Clare et al. 2018; Shattuck and Peluso 2021). As such, both state and non-state actors can attempt to exert control through space.

Territorialization can take place once prior territorialities have been dissolved, a process known as frontiers-making (Rasmussen and Lund 2018). **Frontiers** refer to new or changing spaces of resource extraction and commodification induced by the discovery or interest in a resource, where rules for its extraction have not yet been settled. Frontier dynamics contribute to the 'un-making' of existing orders and places (Cons and Eilenberg 2019; Rasmussen and Lund 2018a; Tsing 2003), through their re-imagination as empty (Barney 2009; Woods 2021), wild (Tsing, 2003) or degraded (Backhouse and Lehmann 2020; Singh 2022).

While territorialization concerns the new rules and orders that are put in place in the context of the energy transition, frontiers refer to the destabilization of previous orders necessary to make space for new ones (Rasmussen and Lund 2018; Meyfroidt et al. 2018). Frontiers are

not “a place or even a process but an imaginative project capable of molding both places and processes […They are] a site of transformations” (Tsing 2003, 5102). As such, frontiers make certain places ripe for resource extraction through material *and* representational practices (Barney 2009).

Territorialization, as an ideal project, often faces resistance when enforced and therefore relies on “recognition by a relevant audience, by social pressure, and by the threat and use of violence” (Vandergeest and Peluso 1995, 389). This process is initiated at frontier moments when a multitude of actors interact to (re)define which practices of resource extraction are appropriate, thereby ensuring or preventing access to them. As such, territorialization affects not only formal ownership and control over land and resources, but also includes actors able to benefit from them. New waves of territorialization can destabilize, challenge, renegotiate, or reinforce existing power structures.

2.2.1.3. Relevance and Use

Territorialization “is a fundamental tool for understanding power” which can be applied to the study of energy transition (Shattuck and Peluso, 2021, 197). Frontiers and territorialization can occur in ‘green’ projects such as conservation areas (Bassett and Gautier 2014; Woods 2021) or renewable energy production (Backhouse and Lehmann 2020; Singh 2022). Renewable energy can be seen as newly ‘discovered’ or ‘re-invented’ resources which can be harnessed from spaces previously territorialized by other uses, such as agricultural production. Moreover, energy autonomy requires naming and delimiting the borders of the territory that ought to become autonomous and, as such, make territorial claims. Therefore, energy transition trajectories can be seen as territorial projects that can either alter or reinforce the existing structure of spatial control.

Territoriality, territorialization and frontiers are central concepts to the dissertation. Through territoriality, I explore the existing mechanisms ordering control over Martinique and

Reunion. Through territorialization and frontiers, I discuss how potential energy transition trajectories affect and reframe existing territorial arrangements. To understand the origins of different energy transition projects pushed through territorial dynamics, I rely on contributions from the literature on imaginaries.

2.2.2 Imaginaries

Energy transitions set goals or trajectories to achieve in the mid to long-term future. As such, they require imaginative work: the ability to prospect an alternative future. These imaginaries do not come from nowhere: they are entrenched in existing ways of understanding the world. Imaginaries are a key concept in the social sciences, with different variations. In this dissertation, I rely on the combination of two 'types' of imaginaries: socio-technical imaginaries and spatial imaginaries.

2.2.2.1. Socio-Technical Imaginaries (STIs) and Spatial Imaginaries

Jasanoff and Kim define STIs as:

> "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology"(Jasanoff and Kim 2015, 4).

STIs are collectively shared values and beliefs about what constitutes a 'good life' and the role that technologies play in achieving it (Chateau et al. 2021; Jasanoff and Kim 2009). They are future-oriented and carry with them positive or negative ideas on the role of technological progress in society (Jasanoff and Kim 2009; 2015; Skjølsvold et al. 2020; Chateau et al. 2021).

Similarly, spatial imaginaries are socially and collectively held ideas and stories associated with space and place (Davoudi et al. 2018; Watkins 2015; Said 2003). Watkins (2015) identifies three types of spatial imaginaries. First, **place imaginaries** are stories and preconceptions connected to a specific place, like a city or a region (e.g., New York,

Martinique, or Reunion). Second, **idealized place imaginaries** refer to ideas associated with *types* of places, such as the 'suburbs' or 'islands'. Finally, **spatial transformation imaginaries** are ideas and narratives about how places change from one type of place/idealized place to another. For example, globalization or gentrification are spatial transformation imaginaries. Like STIs, they are future-oriented imaginaries and act as a bridge between the two theories.

Existing research shows that in the context of the energy transitions, STIs often rely on place-specific characteristics, where geo-physical reality or societal elements take on additional imaginative power (Upham et al. 2023; Benediktsson 2021; Skjølsvold et al. 2020) For Chateau et al. (2021), spatial imaginaries and STIs are co-produced as:

> "particular spatial imaginaries are drawn on by collectives in the construction of sociotechnical visions and feed into STIs. STIs are underpinned by, convey and, as they are performed, contribute to reinforcing particular spatial imaginaries" (3).

2.2.2.2. Collective, Dominant and Marginal imaginaries

It is only through collective engagement that visions of islands and laboratories can take root as imaginaries. STIs can originate from the 'vanguard visions' of influential individuals but only become imaginaries once they stabilize and are shared by a collective (Hilgartner 2015; Kuchler and Stigson 2024; Felt 2015; Upham et al. 2023). What counts as a 'collective' can vary across scales but presupposes a sense of shared understanding able to have an impact beyond one's own thought (Kuchler and Stigson 2024). As such, STIs research is often concerned with dominant imaginaries generated by actors that hold a relative 'power to imagine' and to implement desirable futures (Kuchler 2017). Similarly, spatial imaginaries are often initiated and diffused by powerful, hegemonic actors (Davoudi et al. 2018; Watkins 2015). The likelihood of an imaginary to become dominant increases with the size of the collective, "its proximity to influential instruments of meaning-making (e.g., expertise) and goal setting (e.g., authority)" (Kuchler and Stigson 2024, 14). Therefore, the study of

dominant imaginaries often focuses on the state but can also include non-state actors, working at different governance levels or other actors in the private sector.

Multiple, competing imaginaries can coexist (Chateau et al. 2021; Jasanoff and Kim 2015; Davoudi et al. 2018). While some are widely shared and hegemonic across societies, others are produced at smaller scales and never reach beyond specific places or communities (Mutter 2020; Smith and Tidwell 2016). They are grounded in local experiences, ways of life, and historical developments (Smith and Tidwell 2016). Imaginaries, therefore, can be used to discuss dominant visions of the future and technology, but also how different places that are situated at the margin of dominant power contest or embrace parts of the dominant narrative.

2.2.2.3. Relevance and Use

The combination of spatial and socio-technical imaginaries is helpful to understand how narratives around energy transition are constructed and where they come from (Chateau et al. 2021). Imaginaries are both a tool and a precondition for territorialization (Hommes et al. 2022; Manosalvas et al. 2023). Imaginaries determine "actors' sense of the possible spaces of action" (Jasanoff and Kim 2015, 23). They serve to legitimize territorial projects by making them desirable, or seem inevitable, and form the conceptual starting point from which territorial claims emerge. Imaginaries shape how space is claimed, controlled, and transformed into territory. Energy infrastructures or chosen technologies reflect and "fix imaginaries and related power relations in space and time" around distinct territorial organizations (Hommes et al. 2022, 4). In the context at hand, imaginaries are relevant to studying the energy transitions of *plantation islands*. Imaginaries of islandness, of the 'other', and of modernity were instrumental in establishing the territorial organization of plantations and may find resonance in energy transition discourse. The dissertation relies on imaginaries to discuss preconceptions underlying energy transition projects and the territorial projects that they make possible or prevent.

2.2.3 Note on Imaginaries, Territories and Power

Imaginaries and territoriality are ultimately theories that aim to understand the workings of power. This dissertation, therefore, also attempts to say something about power and its connection with the energy transition. Power is in itself an elusive concept and despite being mentioned extensively by imaginaries and territorial literature, remains rarely defined. Territoriality, in the Anglo-Saxon tradition, sometimes fails to consider aspects of power that go beyond coercive means and understandings of power as 'power over' (Clare et al. 2018). Yet, scholarship on territorialization and frontiers, while focusing on violence and dispossession, also emphasizes the importance of discourses and legitimization practices through various means as tools of power (Shattuck and Peluso 2021; Rasmussen and Lund 2018; Tsing 2003). Imaginaries, despite suffering from a similar state-centric frame of analysis, do offer a way to break open categories of 'common-sense', ideas that are perceived as natural and remain unquestioned, despite their ideological and political nature (Watkins 2015; Jasanoff and Kim 2015).

In both cases, a Foucauldian understanding of power, seen as pervasive and exerted through means beyond pure coercion, transpires through works on territoriality and imaginaries (Hommes et al. 2022; Raffestin 2012; Elden 2013; Jasanoff and Kim 2015; Halvorsen 2019). Hence, the emphasis in both bodies of work on the study of discourses as tools of power (Kearns 2018). Moreover, imaginaries also integrate ideas of 'cultural hegemony' as conceptualized by Gramsci, which relies on the uptake or internalization by 'subordinate' or 'subaltern' groups of the worldview of dominant classes as the natural order (Jessop 2010; Levy and Spicer 2013). This is particularly relevant in post-colonial and colonial contexts (Salem 2021; Sunca 2023; Srivastava and Bhattacharya 2012). The idea of cultural hegemony can help understand the internalization of oppressive frames and worldviews

(Quijano and Ennis 2000; Goreau-Ponceaud 2024; Fanon 1961) and explain how framings like the laboratory island resonate or are reinterpreted locally.

2.2.4 Territories, Imaginaries and the Territoriality of the Plantation

2.2.4.1. Building the Analytical Framework

The analytical framework combines theories on territoriality and imaginaries to explain the renewable energy trajectory of Martinique and Reunion and its effect on the existing structure of control over these islands and their resources as inherited from the plantation system. The existing territoriality represents **the status quo,** which is reflected in imaginaries of space and technology. In the context of the energy transition, these imaginaries generate particular territorial projects that themselves lead to the formulation of alternative energy transition trajectories (e.g., energy autonomy). These trajectories are then implemented through the combined processes of frontiers (unmaking previous orders) and territorialization (remaking). These processes affect existing land use and access to its resources, and therefore, the beneficiaries of the existing territorial arrangements. Together, processes of territorialization and the extent to which they are taken up or resisted affect the existing territoriality of a place, which can be altered, challenged, or maintained by the energy transition trajectory that will prevail. The diagram below schematizes the analytical framework.

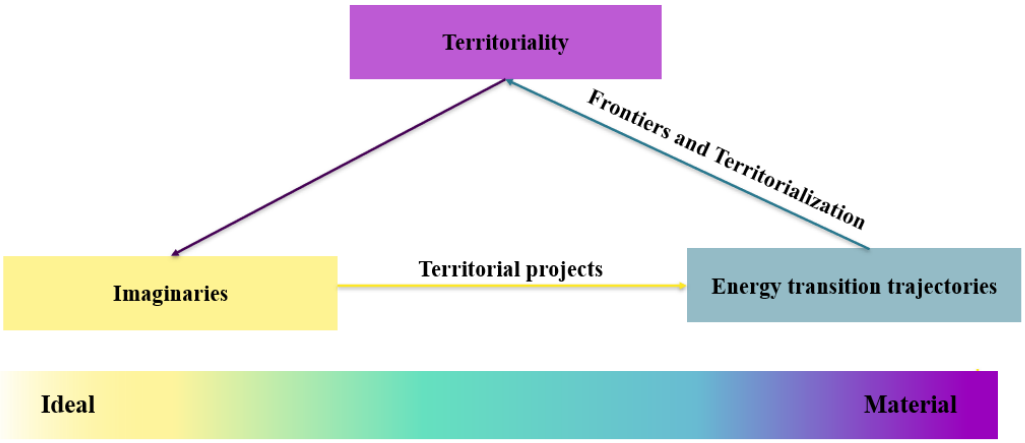


Figure 1 Analytical Framework, Made by Author (2025)

Based on this analytical framework, energy transition trajectories (autonomy or dependency) are analyzed in connection to the territorial project they support. These are expressed through imaginaries and are implemented by re-shuffling or reinforcing existing structures of land use and access. The combination of imaginaries with territoriality is useful to identify what the territorial projects actually are and where they come from. Territoriality help to determine not only the means through which these are achieved, but the relations of power they impact. In short, they help to understand what is at stake for the islands when they transition and how it relates to broader questions around governance, political power and colonial legacies. In the context of the cases studies, I analyze one particular form of territoriality: the territoriality of the plantation.

2.2.4.2. The Territoriality of the Plantation

The territoriality of the plantation is treated as the 'status quo', the existing territoriality that the energy transition might challenge. It refers to the organization of space and imaginaries inherited from the plantations through which control is exerted over an area, its people, and resources. At the inter-territorial level, it denotes a relationship of center-periphery based on

dependency with an external power, which can take many forms, material, ontological, financial etc. At the local or intra-territorial level, it implies an unequal distribution of the land and its resources as well as a monocultural and extractive use of the land. This particular use of the land includes the creation and exploitation of an 'other' and nature or the non-human (as per Ferdinand, 2022). While the latter are essential aspects of the plantation, these dimensions are addressed indirectly in this dissertation and lie beyond the scope of this dissertation. The territorial organization of plantations shapes and limits the kinds of imaginaries that can emerge. In this sense, plantation imaginaries both constrain the range of conceivable futures and limit territorial transformations to those compatible with the plantation structure.

The territoriality of the plantation is used here as an archetype, a set of characteristics that have evolved, reduced, or maybe disappeared over time. In this sense, former plantations often do not fully embody this territorial configuration; rather, each may exhibit certain elements more prominently than others, while also encompassing territorial dynamics that extend beyond or diverge from the plantation legacy.

2.3. Conclusion

Drawing from previous research, this chapter has established that energy, power, and space are interrelated. As such, energy transition trajectories can be understood as territorial processes, or struggles over space and power. Yet, existing literature on energy autonomy fails to account for the territorial implications of such agendas. This is also the case for studies that focus on energy transitions on islands, which tend to replicate popular imaginaries of islands as laboratories. While recent scholarship has identified this tendency, it has yet to analyze which territorial projects these imaginaries actually serve.

Islands have historically been the locus of strong imaginaries and used for the realization of various territorial projects such as plantations. Plantations, both as actual places and as a concept, are relevant for the study of energy transition processes. This is the case for the study of energy transitions in Martinique and Reunion, which have yet to account for the political and territorial implications of energy transition agendas on these islands, given their colonial history as French plantations.

The analytical framework presented here draws from these conclusions. Based on territorial theories and concepts from spatial and sociotechnical imaginaries, this framework is suited to evaluate the impact of different energy transition trajectories upon the territoriality of the plantation. The next chapter introduces the research design used to apply this analytical framework to the study of Martinique and Reunion.

3. Research Design

This chapter outlines the research design guiding the empirical work and analysis. I first present the overall methodological approach and the methods used throughout the study, then detail the specific approaches applied in each empirical chapter (5–7). The chapter concludes by discussing the limitations of the methodology and reflecting on my epistemological stance.

3.1. General Approach

3.1.1 Methodology

3.1.1.1. Case Studies

This dissertation adopts a multi-sited case study approach focusing on two sites: Martinique and Reunion. I selected a case study approach not only because these sites are relevant in their own right, but also because case studies are well-suited to understanding how broader phenomena, such as the energy transition and energy autonomy, manifest differently across locations. Energy transitions are driven by both global processes (emerging technologies, investment, and global politics) and hyper-local ones (available renewable potential and local political structures). Case studies provide substance to the workings of these general processes.

Using two case studies adds breadth to the analysis by exploring how the energy transition unfolds in similar yet distinct settings. I have chosen Martinique and Reunion for their similarities and their difference and as such draw comparisons between the two cases. Yet, the dissertation's main objective is not to compare how Martinique and Reunion differ in their experiences with energy autonomy, but rather to map the different territorial implications that each case reveals. Therefore, I do not take a strict comparative approach, in which one or more variables are held constant, but investigate these cases together and then separately,

according to specific analytical starting points. This structure enables the conjoint investigation of phenomena that extend beyond one or the other island *and* for a focused exploration of specific territorial dimensions of the energy transition that would otherwise be superficial if studied across all cases.

I have chosen to study sub-national islands and former colonies of the EU because of their hybrid position on the world stage: administratively European, yet geographically distant and culturally distinct. These territories are European peripheries marked by persistent inequalities but are also relatively privileged within their regional contexts (Ducastel 2024). Their dual positioning and historical integration within their colonizing states make them particularly relevant for a territorial analysis of the energy transition.

The EU counts nine Outermost regions (ORs), all former plantation islands now governed under the same legal framework as continental regions.[3] I focused on French territories because they make up the majority of the EU's outermost regions, and their highly centralized political system limits regional autonomy and therefore potentially also energy transition processes.

Martinique and Reunion were selected for their shared characteristics as French ORs but also for their differences. Three main differences are essential for the analysis at hand. First, land ownership in Martinique is more strongly marked by colonial legacies than in Reunion, potentially affecting the implementation of renewables on agricultural land. Second, their relative success with the energy transition is contrasting. Reunion is often perceived as a pioneer of the transition in French ORs, while Martinique is a laggard. Third, the islands have historically maintained different political relationships with the French State: Reunion is often seen as more closely aligned with central authorities, whereas Martinique has a longer

[33] French Guiana is not an island.

tradition of political and social contestation (Daniel and David 2021). These differences are explored further in Chapter 4.

Finally, practical considerations influenced the selection. As French ORs, both islands have French as their official language,[4] facilitating interviews and document analysis. Additionally, prior academic work on the energy transition in these territories provides a solid foundation for this study.

3.1.1.2. Discourse Analysis

To investigate the case studies, I follow a discourse analysis approach, inspired by Foucauldian understanding of discourse.

What are Discourses and What is Discourse Analysis?

In the social sciences, the term discourse has multiple definitions. I rely on Hajer and Versteeg's (2005) definition as

> "an ensemble of ideas, concepts and categories through which meaning is given to social and physical phenomena, and which is produced and reproduced through an identifiable set of practices." (Hajer and Versteeg 2005, 175)

Discourses are often understood as reflective of structures of power and powerful tools through which power is exerted (Hook 2001). Yet multiple discourses can coexist and are often contested (Hook 2001; Hajer 2005). The power of discourses lies in their ability to define and restrict the terms under which a specific topic is framed and eventually addressed in reality. They open and close opportunities, include and exclude what can be said and done:

> "The effect of discursive practices is to make it virtually impossible to think outside of them; to be outside of them is, by definition, to be mad, to be beyond comprehension and therefore reason." (Hook 2001, 522)

[4] In both islands, local Creole is also used, which I do not understand. Yet, given the very common use of French on the island and the types of stakeholders interview, the knowledge of French proved to be sufficient.

Most powerful discourses are those that seem to make 'common sense' (Hook 2001). Therefore, discourse analysis seeks to identify these discourses, which may otherwise appear neutral or objective, and investigates how they shape reality.

This approach is suited to the dissertation research's topic and the analytical framework. Discourses, by delimiting the terms and scope under which the energy transition is conceived, restrict possible trajectories (Isoaho and Karhunmaa 2019). Their analysis helps to identify "the politics of transition processes" by revealing points of contention and struggles over key concepts and definitions which ultimately shape the trajectory of the transition (Isoaho and Karhunmaa 2019, 939). Furthermore, territorial struggles usually take place, among other means, discursively. Frontiers rely on unmaking particular orders of meaning to make place for new ones. Territorialization processes subsequently work to legitimize new ways of ordering things (Rasmussen and Lund 2018). Similarly, imaginaries are articulated, performed, and reinforced through discourse. As such, discursive approaches are helpful to study imaginaries (Jasanoff and Kim 2015; Watkins 2015).

How is Discourse Analysis Conducted?

I draw from a Foucauldian, post-structuralist approach to discourse analysis as elaborated by Graham (2011). This approach does not focus on the microanalysis of texts from a grammatical or structural perspective, but on what words and ideas found in texts imply in reality; what the text does (Graham 2011). In the words of Graham (2011):

> "In a Foucauldian framework, one looks to statements not so much for what they say but what they do; that is, one questions what the constitutive or political effects of saying this instead of that might be?" (667)

In practice, this involves analyzing texts, policy documents, or conducting interviews to identify the key elements of a discourse, how they are organized to form a storyline, and their practical impact (Hajer and Versteeg 2005). For example, in the context of this research, this

means examining what key stakeholders say (during interviews, through texts, etc.) and relating it to the actual trajectories of the ongoing energy transition.

3.1.2 Methods

3.1.2.1. Data Collection

The empirical research relied on three data collection sources and methods: semi-structured interviews, observation notes, and documentation. Interviews and observation notes were primarily collected during the fieldwork period, while documents were gathered throughout the research phase.

Field Work

I conducted two field trips in 2023, each for 3 months. The table below provides key information on each field trip.

Table 1 Field Trips in Martinique and Reunion

	Martinique	**Reunion**
Period	11 January- 12 April 2023	6 September- 3 December 2023
Point of anchorage	Fort de France	Saint-Pierre
Total number of interviewees[5]	61	37
Number of interviews	49	33

I resided in well-connected towns to facilitate travelling to different sites. In both islands, I received local academic guidance: in Martinique from my external supervisor, and in Reunion from my host at the University of Reunion's energy research lab within the context of a field research scholarship.[6]

[5] Some interviews were conducted with more than one person at a time.
[6] I received a scholarship from *Campus France* to conduct research in Reunion. I was hosted in the energy research lab of the University of Reunion 'PIMENT'.

Interviews

I conducted a total of 82 interviews in Reunion and Martinique, focusing on actors who are locally active in the energy transition or can influence it, directly or indirectly. This included representatives from public administrative bodies, farmers, agricultural associations, and active local environmental organizations. The list of interviews conducted is available in Appendix A. I selected and contacted participants based on desktop research, interactions during public events, and recommendations from local contacts or interview participants. While this approach carries the risk of creating a network that may reinforce particular viewpoints, it did not prevent participants, including farmers recommended by energy developers, from expressing critical perspectives on renewable projects.

Interviews were guided by a semi-structured interview guide (Appendix B), which contained predetermined questions but allowed flexibility based on participant responses. Each guide was modified depending on the participant and the island, reflecting the analytical focus of Chapters 6 and 7. This approach enabled the collection of both specific factual information and broader reflections related to the dissertation's main research questions.

Interviews generally lasted between 45 and 90 minutes and were mostly conducted face-to-face, with a few held online when scheduling required. Participants were recorded and offered the option of anonymity.[7] Consent forms were provided in advance when possible (Appendix C). In some cases, consent was recorded orally due to participants' reluctance to sign documents. All interviews were conducted in French and subsequently transcribed.

Observation

During the fieldwork, I participated in a series of events and meetings and visited relevant sites. Through attending events and meetings, I gathered factual information about energy transition processes but also could identify who participates in these events and contentious

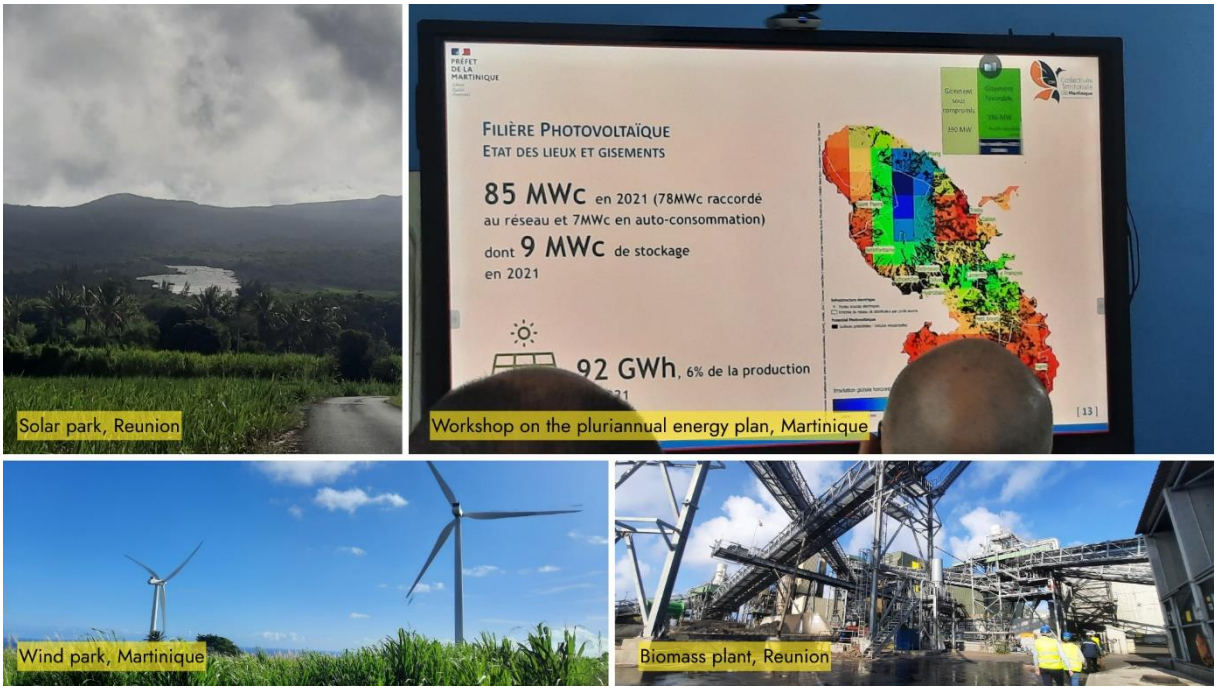
[7] Except if they requested otherwise.

topics. Most notably, in Martinique, I had the opportunity to participate in the workshops to elaborate the new pluriannual energy plan. The table below summarizes the number of events and visits conducted in each field. The full list is available in Appendix D.

Table 2 Summary of Visits and Events Attended During Field Work

Type	Martinique	Reunion
Events and meetings	6	3
Energy production sites	9	7
Farm visits (solar warehouse, agrivoltaics or interested farmers)	7	5

From the site visits, I gathered information on the local environment of each production site, its scale, visual impact, and basic operations. These visits were conducted either in a group, with a guide (e.g., energy developer, farmer, etc) or alone when the site was publicly accessible.



Picture 1 Site Visits and Events in Martinique and Reunion, Taken by Author (2025)

Document Collection

During and around the fieldwork, I collected a variety of documents, reports, news articles, presentations, and other materials. These were collected for different purposes. Some

documents were collected to inform the analysis of energy transition discourse in Chapter 5. Other documents were collected and analyzed to retrieve factual information about the energy transitions, such as renewable capacity targets or information on particular projects. More information on the document analysis is provided in the description for each chapter.

Note on Data Referencing
Throughout the dissertation, data sources are cited using a coded system. Alongside in-text descriptions (e.g., *"solar energy developer"*), I include a code that specifies:

- Type of source (e.g., content, legal text, interview)
- Case or level of production (Martinique, Reunion, or National)
- Specific individuals when relevant
- Unique identifier

This system enables readers to trace specific quotes back to their source documents or institutions, while maintaining anonymity when necessary.
For example:

- C10Nat refers to a document from the corpus of text produced at the national level.
- IntMA2 refers to the interview conducted in Martinique.

A complete list of codes and their corresponding sources is available in Appendix A and E.

3.1.2.2. Data Analysis

The corpus of data was analyzed following a thematic analysis approach. Thematic analysis is a flexible and reflexive approach to identifying key themes and patterns in qualitative data (Byrne 2022). Multiple waves of coding were conducted following the recommendations in Byrne (2022) to establish the themes and refine the list of associated codes. After a first familiarization with the data, the initial stages involved establishing codes, often of a descriptive nature. Thereafter, similar codes are grouped together and eventually clustered into themes, where codes can be considered as sub-categories of an overarching topic used in the interview. This process is facilitated using queries and matrix tools in NVIVO, which provide an overview of each code's frequencies and context. Each theme is then reviewed, considering its relevance to the specific research questions. The different waves of thematic analysis provide a starting point to identify the key elements found in the data, categorize them, and understand their connections. From this, I could connect the data to the dynamics of energy transition on each island. The next section provides a detailed description of the data samples and methodological process followed in each empirical chapter.

3.2. Approach per Chapter

3.2.1 Studying Energy Transition Imaginaries: Chapter 5

In this chapter, I investigated the imaginaries found in the energy transition discourse *in* and *about* Martinique and Reunion. The analysis primarily focused on identifying mainstream, dominant imaginaries generated by actors who hold a relative 'power to imagine' and to implement desirable futures (Kuchler 2017). The likelihood of an imaginary to become dominant increases with actors' "proximity to influential instruments of meaning-making (e.g., expertise) and goal setting (e.g., authority)". (Kuchler and Stigson 2024, 14). In this chapter, I focused on imaginaries generated by local and national elites as well as media outlets. Media reports are crucial to the public performance and stabilization of imaginaries as they offer platforms for them to "acquire social significance" (Vicente and Dias-Trindade 2021, 712). Moreover, I have also integrated counter-voices to these dominant imaginaries, embodied primarily by the Martinican civil society association ASSAUPAMAR. While not formally part of the 'dominant group' of actors, the association can nonetheless exert considerable power over renewable energy integration.

The analysis relied on a corpus of 103 documents and a sample of 42 interviews. Documents include political debates, speeches, reports, planning documents, and news articles generated at the local and national levels, from the first transition policies designed for overseas territories (2007) to the end of 2024. The documents were collected through desktop research, focusing on key moments and events related to the energy transition in the case study under investigation. These include, for example, the first legislative texts setting targets for the energy transition in overseas territories, the release of each island's energy planning, or the conversion of power plants to biomass. The list of documents collected is non-exhaustive but representative of the mainstream discourse around energy transitions in those regions, as it is

compiled from various sources across time and scale. The complete list of texts is available in Annex E.

The transcripts of 42 semi-structured interviews were also analyzed. This sample corresponds to the type of actors under investigation in this chapter, namely those who hold a relative power and can influence the energy transition in their specific locality. They are policymakers, civil servants involved in energy governance, public agencies, as well as energy producers and grid managers, and representatives of non-energy institutions that can nevertheless influence the energy transition. Those include, for example, agricultural governance agencies and associations. The interview from the civil society group ASSAUPAMAR was also included. ,

Table 3 Interview Sample Chapter 5

Case	Interviews per type of institution (n42)
Martinique (n24)	energy developers (n8), governing institutions at regional (n2), state (4), and local (n4) levels, supporting institutions involved in research, monitoring, and financing (n2), grid operation and distribution (n2), and civil society(n1).
Reunion (n18)	energy developers (n6), governing institutions at state (n2), regional/departmental (2), and local(n3) levels,[8] supporting institutions involved in research, monitoring, and financing (n4), grid operation and distribution (n1).

The semi-structured interviews included a set of questions designed to address this part of the analysis. For example, I asked the interviewees to explain how they perceived the energy transition in their territory, whether and why it was important. I also asked them to share which type of energy sources and infrastructures they envisioned or preferred, and which ones they would rather exclude. Those simple questions often led to broader reflections on the development of renewable energy on the island and how they wish for it to further develop. In addition to the interviews and texts, this chapter also draws from observation notes acquired during participation in workshops and events in Martinique and Reunion during the fieldwork.

[8] This include inter-municipal groupings and municipalities.

The corpus was analyzed using a thematic analysis approach as described in the section above.

3.2.2 Studying Negotiations Over Land Use: Chapter 6

This chapter examines the contested implementation of agrivoltaics in Reunion. The analysis draws on interviews with key stakeholders from the agricultural, energy, and governance sectors, complemented by field notes from five guided site visits to agrivoltaics projects. Interviewees were selected based on their relative influence and stake in PV-siting decisions. They include local state representatives, civil society organizations, regional policymakers, farmers' professional organizations, individual farmers experimenting with agrivoltaics, and energy developers.

Table 4 Interview Sample Chapter 6

Sector	Interviews per type of organization/individuals and sector (n30)
Energy	energy developers (n6), governing institutions at regional (n3), state (n1) and local (n1) levels, supporting institutions involved in research, monitoring, and financing (n2), grid manager (n1) and intercommunal electricity union(n1).
Agriculture	civil society (n2), farmers (n4), farmers representation or cooperatives (n4), governing institution at state (n1) and regional level (n1).
Other (cross-thematic)	civil society (n1), local municipality (n1) and supporting institutions involved in research, monitoring and promoting activities (n1).

The interview guide was also adapted to investigate agrivoltaics and land use issues in Reunion. For example, I asked participants to identify the type of land they found most suitable for renewable energy development and how they perceived the development of PV on agricultural land and agrivoltaics. To address the general perception of agrivoltaics, each interview was coded according to the respondents' relative position in favor of or against agrivoltaics. Then, to address how such positions are substantiated, I grouped respondents' positions by themes. Each theme aimed to identify topics that mobilized justification for their position on agrivoltaics.

3.2.3 Studying Land Beneficiaries: Chapter 7

The last empirical chapter examined who benefits from Martinique's electricity system as it integrates utility-scale wind and solar capacities. This required two types of data: (1) land use and ownership in areas where renewables are being developed, and (2) information on the energy developers operating the plants. To collect these, I relied on interviews, field notes, and document analysis, combined with satellite imagery, cadastral plans, and data on installed capacity. The analysis focused on installed and planned projects from 1 MW upwards, as this threshold is significant in the context of Martinique's limited territory. Moreover, it captures large-scale installations while keeping the dataset manageable.

The chapter draws on the complete set of 49 interviews conducted in Martinique, covering farmers, energy providers, residents of the wind park, the civil society organization ASSAUAPAMAR, and state services.

Table 5 Interview Sample Chapter 7

Sector	Interview per type of organization/individuals and sector (n49)
Energy	energy developers (11), governing institutions at regional (n3), state (n1) and local(6) levels,[9] supporting institutions involved in project planning, research, monitoring or financing (n4), grid operations and distribution (n2).
Agriculture	farmers (n5), farmers' representation or cooperatives (n3), agro-industrial groups(n2), governing institutions at the state level (n1), landowner (n1), research (n1).
Other (cross-thematic)	civil society (n2), municipalities (n4), permitting administration (n1), local member of the parliament (n1), residents near the wind park (n4).

Interview guides included questions on who benefits from the energy transition and on the land requirements of renewables. Field notes from event participation complemented these interviews. All qualitative material was analyzed thematically with two objectives: (1) to identify whether land use, access, and decision-making power were raised, and (2) to determine which themes substantiated these issues. Interview findings were triangulated with the collection of data on installed and planned wind and solar capacities.

[9] Inter-municipal groupings and municipalities.

Installed Utility-Scale Capacities

Installed capacities were studied using EDF's open dataset for Martinique, which provides information on capacity, resource, and grid-connection date, but not on plant names, developers, or exact locations (EDF Open Data Martinique 2024). This information was derived from other sources, such as projects' environmental assessments, presentation materials, company websites, satellite imagery, and field knowledge.

All plants above 1 MW were geolocated and cross-referenced with cadastral classifications (agricultural, natural, urbanized, etc.) and, when possible, municipal records of land ownership. Smaller projects were excluded from systematic mapping, as each would require a detailed manual investigation. PV parks over 1MW only represents 4.6% of the total PV capacity installed on the island. Nonetheless, these parks have the most impact on the landscapes and the overall structure of the grid.

Table 6 Distribution of PV Capacity by Installation Size

Size	**Share of PV capacity**
>1MW	4.6%
>0.5MW	6.2%
>0.1MW	40.1%

Average size: 0.2 MW

Ideally, a systematic analysis of all parks above 100 kW would have been relevant to capture the concentration of actors and projects more comprehensively. However, no dataset compiling such details is publicly available. The combination of manually retrieved data, along with the compilation of information on planned installations (call for tenders), provides a limited yet informative picture of the electricity market and its dominant players.

Planned Utility-Scale Capacities

Planned projects were identified through PV auction results between 2015 and 2023. The analysis involved two steps:

1. Auction results: winners were compiled and classified by installation type (roof vs. ground-mounted), company, and project size to establish total awarded capacity per developer. This also included projects under 1MW.

2. Ground-mounted projects: for these, I collected information on expected location, land use, land classification, and ownership using the same methods as for installed projects. All but one project exceeded 1 MW.

Identifying Developers

Ownership proved complex, as many projects are managed through Special Purpose Vehicles (SPVs) created for single installations, often under opaque names such as *AFRD 50* or *URBA 194*. Parent companies were identified wherever possible using the business registry "Papers," which links subsidiaries to larger firms.[10] Some remained untraceable. For joint ventures, I distributed installed capacity equally among shareholders.

3.3. Limitations

This research design effectively captures the territorial dynamics that shape the energy transition trajectories of Martinique and Reunion. Yet, it also has a few limitations in terms of its overall methodological approach, the methods employed, and the scope of the analysis.

By focusing exclusively on Martinique and Reunion, the results of this research are context-specific and not statistically generalizable. This means that some insights are tied to the particular historical, political, and socio-economic context of Martinique and Reunion.

[10] https://www.pappers.fr/

Nonetheless, the case study approach remains relevant to broader theoretical discussions on energy transition in islands and other peripheries by exploring aspects that emerge under these conditions.

The qualitative methods (interviews, observations and document analysis) employed in the dissertation carry a greater degree of researcher influence. It is therefore important to recognize that my positionality as a researcher shapes the analysis. Interviewees themselves are also biased and represent particular, situated viewpoints. This is, however, acknowledged throughout the dissertation and contributes to understanding the negotiated nature of energy transitions.

Finally, the research design is limited in terms of scope: of what and who is being researched. While the first empirical chapter looks at the energy transition in general (Chapter 5), the rest of the empirical work focuses on the transition of the electricity sector using locally available resources: wind and solar. This, of course, limits the scope of the findings, which do not address the decarbonization of the transport sector, nor do they investigate other relevant, but less readily available technologies such as local biomass, geothermal energy, marine technologies, etc. Nonetheless, the limited scope of the analysis allows for a deeper exploration of specific technologies that were the most relevant to contributing to energy autonomy objectives as of today. Moreover, at the global level, electrification emerges as the common strategy for decarbonization of all sectors (Christophers 2025). In Reunion and Martinique, electricity has also been the first sector subjected to decarbonization efforts.

The limited scope also applies to the range of perspectives that were investigated. Perspectives from marginalized groups and local citizens are only partially represented in the thesis, as the analysis primarily focuses on dominant stakeholders on each island, including energy governance actors, producers, and representatives of agricultural associations. The analysis in Part II relies heavily on the imagined transitions of dominant actors, which may

not align with the aspirations of citizens who do not directly interact on energy topics. Moreover, the focus of Chapter 6 on agrivoltaics led me to interact with regulatory bodies and actors directly involved with these projects. This is partly because contestation in Reunion occurs mainly through administrative and political channels rather than public protests.

Moreover, the exclusive focus of the interviews on locally based actors, including State representatives and local staff of international firms, further limits the scope of the analysis. National-level stakeholders not based in the case studies, such as representatives of relevant ministries or the Regulatory Commission on Energy (CRE), were not interviewed due to the study's local scope and reachability constraints. Their perspectives were instead drawn from textual sources, which, while sufficient for identifying narratives, could have been enriched by direct interviews.

3.4. Note on Epistemology and Positionality

Defining an ontological and epistemological framework is often challenging. This reflects the inherent difficulty of the task: how can anyone know what the nature of reality is and how knowledge is derived? Acknowledging that I do not have these answers, I derive my onto-epistemological stance from my research interests and the theoretical and methodological approaches I am drawn to. As a researcher, I am interested in how ideas form and shape our perception of reality. This interest, combined with the methods used in this dissertation, reflects a constructivist epistemology, which views knowledge as tied to people's interpretations of reality. Adopting an interpretivist, and at times post-structuralist, approach, I seek to understand how people create meaning and to deconstruct the structures through which knowledge is produced (Moon and Blackman 2014). Consequently, the research design assumes that knowledge is always situated, constructed, and relative.

This leads me to reflect on how my positionality shapes my research. As a researcher from a European university, I gained relatively quick access to public agencies, energy producers, and local authorities. My positionality as a white female outsider was more confronting outside of these spaces, where I was not always sure how to interact, and questioned my legitimacy. Being an outsider also meant that sometimes I lacked the required network to reach less accessible people: this includes both more marginal or disadvantaged populations or on the contrary, local elites. This applied particularly to approaching large plantation owners in Martinique, which proved hard to reach without prior connections. Finally, my positionality affected the dynamics of the interviewees: the extent to which I was comfortable asking about racially sensitive issues, as well as how much they were willing to share with me. As an outsider and non-Creole speaker, the interviews were conducted in French. While all interviewees spoke French as proficiently as any other French person, understanding and speaking Creole could have been beneficial to create greater trust with the interviewees. The research findings thus offer a partial explanation of energy transition trajectories and the dynamics that shape them. This is the nature of scientific knowledge creation: to produce explanations that, when combined with others, build a deeper understanding of the world.

4. From Colonies to Non-Interconnected Zones: Martinique and Reunion Through a Territorial Lens

In line with the focus of this dissertation, I introduce Martinique and Reunion through the lens of their territorial history: the various attempts over time to control and define them, their people, and their resources. Starting with the colonization of Martinique and Reunion, the chapter discusses the extent to which the territoriality of the plantation changed as institutional, socio-economic and energetic systems emerged.

Martinique and Reunion are very distinct places. Martinique is an island in the Lesser Antilles arc of the Caribbean, with a declining population of 361,019 inhabitants spread across 1,100 km² (INSEE 2021). Reunion is more than twice as big as Martinique, both in terms of its (growing) population (881,348 inh.) and its size (2,512 km²) (INSEE 2021). Still, these islands are bound by a shared history as former French colonies now integrated into the State. There are many debates within academic communities on the use of different terms to describe the persistence of colonial logics (coloniality, neocolonialism, postcolonialism), as well as theoretical frames for studying and deconstructing them (decolonial or postcolonial theory). Several authors who have studied French overseas regions have chosen to describe these places as *postcolonial* (Manglou 2024; Ferdinand 2018; Ducastel 2024; Vergès 2005), a category that I also choose to use here.

The postcolonial label illustrates the ambiguous, or 'hybrid,' position of these territories. Martinique and Reunion are not easily categorized in the typical dichotomies that sort places as either colonized or independent. These islands were indeed colonies that were neither fully decolonized, nor do they remain 'full-colonies'(F.Vergès 2005a). In contrast to other places that have chosen the path of independence, Martinique and Reunion were integrated and assimilated within the State. They find themselves at the intersection of two realities:

geographically part of regions commonly identified as the 'Global South,' yet economically and institutionally situated within the 'Global North' (Ducastel 2024).[11] This leads to a situation where Martinique and Reunion are more disadvantaged within France, but relatively well-off in their regional context. Postcoloniality is therefore helpful to capture the ambiguity of these regions, which are in:

> "a situation in which the effects of the colonial regime persist, while new experiences arise from the decline of local production (sugar, bananas, pineapples), integration into the European sphere (difficulty competing with continental economies: distance from the metropole, cost of labor), globalization (competition with emerging countries), the increase in the number of graduates, and the emergence of demands for historical reparations (memory of slavery, colonialism) and assertions of cultural difference. These are postcolonies." (F. Vergès 2005, 69).[12]

Therefore, despite their differences, Martinique and Reunion are connected by their shared condition as postcolonial entities. This chapter considers this complexity by highlighting where Martinique and Reunion share similar experiences and when their experiences diverge. Through this conjoined presentation, I highlight the territorial implications associated with their classification as colonies, departments, outermost regions, and ultimately as non-interconnected zones (ZNIs) within the context of the energy sector. The chapter is divided into two sections. First, I review the legacies of the plantation in both islands and the contemporary struggles that animate social and political debates. Second, I outline the specific characteristics of their energy system and the current trajectory of their energy transition. Throughout the chapter, I characterize the territoriality of Martinique and Reunion as one still marked by the logics of plantations.

[11] Global South/North dichotomies are themselves problematic in the sense as they homogenized widely different places with one advantaged vs disadvantage group.
[12] Own Translation from French.

4.1. Situating Martinique and Reunion: From Colonies to Departments to Unique Territorial Entities

4.1.1 Colonization and the Plantation System

Reunion and Martinique have a known history predating their 'discovery' by European expeditions. When the French first settled and colonized the islands of Martinique and Reunion in the 17th century, they landed in two distinct contexts. Martinique was then inhabited by the Caribs, an indigenous tribe from South America. The Caribs were expelled and killed by colonizers, until none remained on the island (Nicolas 1996). In contrast, when European settlers arrived in Reunion in the 17th century, they found an island double the size of Martinique and undisturbed by human activities.[13] This contributes to the framing of Reunion by the first European explorers as a 'Garden of Eden' (Holstein et al. 2024).

In both islands, the first waves of settlements substantially modified landscapes and existing ecosystems (Holstein et al. 2024; Ferdinand 2019). This took place through land clearing and the establishment of an agricultural system based on monocultures (Holstein et al. 2024). After experimenting with different crops, settlers turned Martinique into a 'sugar island' through the cultivation of sugar cane and the processing of sugar. Similarly, Reunion, entered the sugar trade at the beginning of the 19th century (Holstein et al. 2024).

Beyond their ecological impact, plantations introduced a distinct spatial organization. They monopolized fertile plains and restricted local food production to elevated, less fertile terrains or to subsistence gardens, creating a structural dependence on imports (Chivallon 2004; 2009; Roinsard 2014; Benoist 1983; Ferdinand 2022). This dependency is not only material but also political. As a colony of France, Martinique and Reunion are bound in center-periphery

[13] As pointed out by (Manglou 2024), the lack of a preexisting permanent population in Reunion, the 'myth of the settlement', is sometimes recuperated to defend the idea that Reunion was, in fact, not a colony. Yet, the island was known by Arab merchants prior to its sighting by Portuguese fleets and later settlement by the French (Fuma 2013).

dynamics, whereby the islands are ultimately governed by an external power (France) and their existence dictated by the production of resources for an external market (France and Europe).[14]

Plantations came hand in hand with the establishment of a socio-racial hierarchy of work and life, with at its center the plantation —the *habitation* —and its master —the *habitant* (Roinsard 2014; Ferdinand 2022; Holstein et al. 2024). While first relying on the work of European indentured workers, the workforce of the plantation is soon ensured by enslaved persons coming from the African continent.[15] With the abolition of slavery in 1848 (for which slave owners were financially compensated) both islands resorted to indentured workers, further contributing to the ethnic diversity of the islands. This system continues to rely on an exploited and racialized workforce, lasting up to the end of the 19th century in Martinique and as late as 1933 in Reunion (Fuma 2013; Northrup 2000; Flory 2019).[16] The colonial era officially ended with the change of status from a colony to a department in 1946.

4.1.2 The *Departmentalisation*: Assimilation, Autonomy or Independence?

4.1.2.1. Change of Status

In 1946, the four 'old colonies' of France, namely Martinique, Guadeloupe, French Guiana, and Reunion, became French departments as a result of the advocacy led by influential local figures in opposition to plantation owners (Lavenaire 2017; Manglou 2024). This transition is known as the *departmentalisation*. Unlike other colonial territories that chose the path of independence, this process aimed to decolonize these places by making them integral parts of

[14] This is not to say that the rule of France over its colonies is not periodically contested locally, as plantation owners aim at gaining more power.
[15] Ferdinand's book (2019) offers a compelling description of the slave trade directed to the Caribbean plantations, highlighting the systematic horror of the enterprise.
[16] Based on trickery and unfair contracts, indentured workers are exploited and forced to live in miserable conditions.

the colonizing State. For local proponents, the objective "is to break with the colonial era and the inequalities intrinsic to this social organization" by gaining access to the same rights and social advantages as any other French citizens (Roinsard 2014, 173).[17] In principle, this implies the full application of French law in these territories and their assimilation into France. This means for Martinique and Reunion to essentially become French, leaving little room for local particularities (Bishop and Phillip 2018).

In practice, French administrators quickly drew differences between the new departments and France to justify a delayed or differentiated treatment in the transposition of rights (Lavenaire 2017; Carniama 2021). This differential treatment, coupled with a delayed improvement of living conditions, undermined the legitimacy of the *departmentalisation* process among the local population (Lavenaire 2017; Holstein 2014). This contributed to the rise of autonomist and independentist movements across overseas departments. These factions advocated for the recognition of their cultural differences and greater decision-making power, either within the framework of the State (autonomist) or independent from it (independentist) (Daniel 2002; Labache 2017).

At the heart of these different territorial projects (assimilationist, autonomist and independentist) lies the question of development: the achievement of greater living conditions through access to consumption and infrastructural development. For autonomists and independentists, this development should be endogenous and not be reliant on the State. This attachment to developmentalism as the only way forward has been described by researchers as an inability to think beyond the colonial prism and its ontologies (Manglou 2024; Holstein 2014). For Manglou (2024), drawing from Fanon and Césaire,[18] this path denotes the

[17] Own translation from French

[18] Frantz Fanon and Aimé Césaire are two influential Martinican figures. Fanon has received most attention from decolonial theorists and activists for his work on the psychology of colonialism and decolonization struggles. Césaire was a writer, poet and key political figure in Martinique (Longstanding mayor of Fort de France, the administrative center of Martinique). He is known as the father of the *departementalisation* but also for his critique of that process and his turn towards the autonomist project.

"survival of the plantation which, in addition to organizing space, restricts the possible imaginaries of the post-colonial territory."[19] (40). Nonetheless, the post-*departmentalisation* period is critical for these former colonies, characterized by debates over the position of these islands within France and whether to claim greater recognition of cultural differences or to strive for assimilation to secure the transposition of social rights (Manglou 2024, 81; Daniel 2018).

4.1.2.2. Change and Continuity in the New Departments

The rise of autonomist sentiments, often associated with leftist factions, eventually raised concerns from the State, which then accelerated its modernization and development program in overseas departments. Through the development of infrastructures and rising living standards, the State was able to "secure national interests by fighting against an internal threat, autonomist or separatist, and by making these territories showcases of French ingenuity." (Holstein 2014, 140).[20] Socio-economic policies and infrastructures are then quickly ramped up in both islands.

In the 1960s, overseas departments were subjected to land reforms aimed at developing their agricultural sector while maintaining support for the sugar cane industry. As such these reforms failed to renew the "colonial socio-economic structure of these departments" and entrenched them into a situation of food dependency (Lavenaire, 2017, 194).[21] In Reunion and Martinique, these reforms were implemented differently, resulting in different consequences. In Martinique, the reform failed to change the plantation structure of land ownership and maintained historic habitations. In contrast, in Reunion, the reform partly succeeded in breaking from the plantation structure by delinking agricultural land ownership from the class of plantation owners. Nevertheless, this reform maintained the sugar cane industry in place,

[19] Own translation from French
[20] Own translation from French
[21] Own translation from French

financially benefited plantation owners, and preserved structural inequalities between sugar cane-producing localities in the plain (*Les Bas*) and those dedicated to subsistence agriculture in the highlands (*Les Hauts*) (Candau and Gassiat 2019).

Despite the persistence of the plantation system, the material conditions in both islands substantially improved from the 60s onwards due to increased public spending from France and the development of infrastructures, including energy infrastructure (Bishop and Phillip 2018; Yoann Pelis 2000). This modernization was accompanied by a rise in consumption levels and the entry into the 'consumer society' (Lavenaire 2017; Holstein 2014). The achievement of the developmentalist program reinforced the material and financial dependence of the Reunionese and Martinican social and economic systems. This undermined the popular legitimacy of autonomist agendas, as a change of administrative status could jeopardize the islands' survival (Labache 2017). In Reunion in particular, local populations reasserted their French cultural identity, and their attachment to the assimilationist project (Carniama 2021). Nonetheless, demands for greater equality with the rest of France *and* for the recognition of local identities remain important in both territories as they continue to animate political and cultural discourse, albeit without advocating for political independence (Bishop and Phillip 2018; Malcom Ferdinand et al. 2020; Carniama 2021).

4.1.3 Contemporary Struggles

4.1.3.1. Differentiated Status and Recognition of Particularities: Attempts at Reducing Institutional Dependencies

In 1982, overseas departments also became regions of France, extending their decision-making power. There exist then two governing institutions in each island, governing the same geographic area: the department and the region. The superposition of a department and region over the same geographic area is an exception within the French administrative system. At the turn of the century, new European and French national provisions further redefined their

administrative status by emphasizing both their difference from mainland Europe as a group and individually as places with their own particularities. This contrasts with former universalist claims and assimilationist approaches (Daniel 2018). Since 1992, Martinique and Reunion have been Outermost Regions (OR) of the European Union, a terms which applies to the Sub-National Islands Jurisdictions (SNIJs) or regions of the EU.[22] This status concerns six regions in France (Mayotte, Martinique, French Guiana, Guadeloupe, Reunion, and Saint-Martin), two in Portugal (Madeira and the Azores), and the Canary Islands of Spain, most of which former 'plantation islands' and colonies of the State they still belong to. The OR status acknowledges the unique characteristics and structural challenges of these territories, enabling derogations from EU law and access to supplementary support mechanisms.[23]

Subsequently, in 2003, a constitutional reform revised the status of the 'four old colonies',[24] allowing these places to negotiate their own administrative status and granting them the possibility to apply for temporary legislative power over specific affairs.[25] Following this revision, Reunion and Martinique took a different path in two main regards. First, Reunionese politicians opted out of the right to obtain legislative power, concerned that it would make Reunion too different from the rest of France (Carniama 2021). Second, in 2016 Martinique became a unique territorial collectivity (*Collectivité Territoriale de Martinique*), merging the region and the department into a single institution. This construction sets Martinique further apart from the continental regions and departments and closer to other French autonomous territories. In contrast, Reunion decided to maintain its dual administrative structure. Despite these differences, each island operates within the jurisdiction associated with those of other regions and departments of France, with a few exceptions based on their 'overseas' status.

[22] French Guiana remains the exception here as the only OR that is not an island.
[23] Article 349 of the Treaty on the Functioning of the European Union (TFEU).
[24] Along with Mayotte, Guadeloupe, and French Guiana, they are all ruled by article 73, in contrast to other overseas territories, which enjoy more sovereignty over local affairs, ruled by article 74.
[25] In practice, this right is rarely granted but also marginally used when granted (Daniel and David 2021).

Note on Terminology

Across the dissertation, I use the term '**overseas regions'** to talk about places that hold the status of departments and regions of France, either under the umbrella of a unique institution (e.g. Martinique) or two separate institutions (e.g. Reunion).

I use the term **'overseas territories'** to refer to all territories still attached to France, which include overseas regions and other semi-autonomous entities (e.g. New Caledonia).

The administrative status of Martinique and Reunion has therefore evolved from colonies to departments and finally to EU regions and nationally differentiated entities with their own institutional frameworks. This administrative change illustrates a new approach with national and local discourse that now focuses on the differences and the qualities of overseas regions, among themselves and with France (Daniel 2018). This translates into the continuation of differential territorial rules and exceptions both at the EU and national levels. ORs are often granted derogation regarding market liberalization or taxation policies, helpful to tailor national legislation to the specific needs of these regions. Moreover, the administrative evolution in the 'four old colonies' did reduce institutional dependencies by granting additional decision-making power to these new administrative entities. Nonetheless, legislative power remains limited as these regions operate within the confines of a heavily centralized state. Additionally, exemptions for the common rule can also contribute to delay social change or maintain structural deficiencies (Hoarau 2023; Beauvallet et al. 2016; Daniel and David 2021). In this context, greater recognition of cultural and local specificities is not sufficient to erase the persistence of colonial legacies as dependencies and inequalities persist (Daniel and David 2021).

4.1.3.2. Persisting and Widening Dependencies

Martinique and Reunion's status and material conditions have, of course, evolved greatly since the colonial era. Yet, both islands' territoriality remains shaped by a range of structural dependencies that extend beyond the institutional sphere. As illustrated in previous sections,

the rise in living standards in both territories has been accompanied by growing reliance on imported material goods. The absence of locally supportive industries further reinforces their dependence on French and EU subsidies to meet the needs of populations facing persistent poverty and unemployment. Among the key drivers of these dependencies is the current organization of agricultural land.

Dependency and the Land

Dependency in Martinique and Reunion today is partly the result of the colonial structure of the plantations. In both territories, as presented in the table below, land use and agricultural activities are still dedicated to the production of export-based cash crops, namely sugar cane in Reunion and banana and sugar cane in Martinique, representing respectively 55% and 43.8% of the total Used Agricultural Area (UAA) (Agreste 2023; Agreste 2021). In Martinique, most sugar cane is used for rum, whereas in Reunion it is mainly cultivated for sugar refining.[26] The preeminence of these crops is a direct legacy of the agro-industrial structure of the plantations, which marginalizes subsistence farming and local markets (Parrot and Joltreau 2024).

Table 7 Export-Oriented Agriculture in Reunion and Martinique (Agreste 2023; 2021; Ademe 2022)

	Martinique	**Reunion**
Sugar cane (% of the UAA)	18.4%	55%
Bananas (% of the UAA)	25.4 %	na
Food dependency rate (%)	87%	77%
UAA /total land mass (%)[27]	28%	15%
Decrease of the UAA 2010-2020 (%)	-12%	-9,7 %

This constrains the land available for local production, as illustrated by food dependency rates. Tensions around food dependency are exacerbated in Martinique due to the contamination of its soil by pesticides previously used in banana plantations, which restricts the type of crops that can be grown on polluted sites. Moreover, the primacy of plantations is

[26] Rum is usually produced from by-products of the sugar refinery process. In Martinique, however, Rum is produced directly from sugar cane juice and is therefore not associated with the making of sugar.
[27] 45% in mainland France.

reflected in local landscapes, particularly in valleys, where these crops dominate the environment.

Picture 2 Plantations in Martinique and Reunion, Taken by Author (2023)

In both islands, the total size of the UAA is both relatively scarce and diminishing, adding to pressure on the agricultural land and food production. In response, Martinique and Reunion aim to protect farmland and diversify their food production in hopes of achieving greater levels of food autonomy, an official objective in both islands. Nonetheless, the sugar cane and banana industries still wield significant influence over local policy and receive substantial French and EU public support, even though services now represent the primary economic sector (Joltreau 2023).

In Martinique, this situation has evolved to an unequal economic and land ownership structure, whereby the social-racial class of historic plantation owners, known as *Békés* is estimated to own around half of the agricultural land, despite representing around 1% of the total population in Martinique (Zander 2013). This is representative of official data on agricultural land ownership, which shows that despite the high number of 'micro-farms', a minority owns a substantial part of the UAA (Marzin et al. 2022; Parrot and Joltreau 2024).

Moreover, *Békés* still own a large share of the island's economic activity through their reconversion into the import-export sector and retail activities (Rauzduel 2020; Ferdinand 2015).

In Reunion, economic power is less clearly associated with a socio-racial class. Nonetheless, the sugar cane sector remains extremely important in the island. The sugar cane sector is dominated by the two sugar refineries owned by the multinational Tereos, which holds significant power over sugar cane farmers and receives political and economic support at various levels (Joltreau 2024). In both islands, the concentration of agriculture on export-oriented crops deepens various dependencies. It heightens reliance on imported food and deepens the agricultural sector's reliance on subsidies. Finally, the agricultural model is sectorally dependent on a few industries (sugar cane and bananas) and on a few actors that either have most of the land (Martinique) or yield disproportionate power over the agricultural sector (Reunion).

4.1.3.3. Inequalities and Social Discontent

French overseas regions display persistent external (in comparison with mainland France) and internal (between the local population) inequalities (Hoarau 2023). Overseas citizens are disadvantaged in terms of health, education, and economic well-being compared with mainland France (Chay and Mouhoussoune 2020; Méjean 2020). The cost of living in Martinique and Reunion is, respectively, 7.1% and 12.3% higher than on the mainland. A situation aggravated by relatively high poverty and unemployment rates in both islands, which are two to three times higher in these islands (Hoarau 2023). Beyond disparities with France, overseas regions are also internally unequal places (Hoarau 2023). Internal inequality is particularly illustrated by the S80/S20 indicators, which show that "income held by the

wealthiest 20% is 5.4 times higher than that held by the poorest 20% in La Reunion, and 5.7 times higher in Martinique" (Hoarau 2023, 9).[28][29]

The persistence of internal and external inequalities generates discontent among local populations (Malcom Ferdinand et al. 2020; Hoarau 2023). These are expressed differently on both islands. In Martinique, social conflicts directed at the State or powerful economic actors are recurrent. Two main issues have been at the forefront of social protest in Martinique: contamination from pesticides used in banana plantations and the high cost of living.

Social discontent in Martinique

- **Cost of living crisis:** In 2008-2009, a 44-day general strike against high living costs spread across the Antilles and French Guiana. This movement was reignited in 2024, causing a series of protests and blockages.
- **Chlordecone scandal**: Refers to the broad social mobilization around the continued use of an organochlorine pesticide in banana plantations in Martinique and Guadeloupe up to 1993, despite earlier reports of its high toxicity **(Ferdinand 2018; Ezeonu 2021)**. Chlordecone has contaminated local ecosystems and is associated with numerous health issues **(Dallaire et al. 2012; Multigner et al. 2016)**. Decade-long court proceedings have been ongoing to establish the State's responsibility and to determine due reparations, resulting in several protests over the years.

Both issues highlight structural issues inherited from the plantation system and the inequalities it has created. The pesticide scandal displays both the discontent with the national state and a social critique of a system that benefits *Békés* at the expense of the rest of the population, "resulting historically from their colonial and slave-owning past" (Ferdinand 2015, 174; Robar 2024).[30] Similarly, discontent with living costs is also directed towards the "monopolistic practices of the group of *Békés*"(Chivallon 2009, 11), questioned for taking excessively high margins at the different points in the value chain that they control (Chivallon 2009; Hoarau,2019).[31] In contrast, social movements are scarcer in Reunion (Odin 2021). While the issue of high cost of living has been reverberated across overseas regions, including Reunion, it failed to generate constant social mobilization, as seen in Martinique.

[28] S80/S20 represents the ratio of the income share of the wealthiest 20% (S80) to the income share of the poorest 20% (S20).
[29] Own translation from French
[30] Own translation from French
[31] Own translation from French

Both in Reunion and in Martinique, the plantation structure has evolved but remains a key characteristic of these islands' territoriality. Dependency, inequality, and the continued appropriation of land for the export-based crops still fundamentally define the structural organization of these islands, albeit with periodic contestations. Some of these characteristics are reflected in the structure of their electricity system.

4.2. Martinique and Reunion as Non-Interconnected Zones

The electricity systems of Martinique and Reunion have evolved along broader territorial stages. This section outlines how their energy systems have been set up and outlines how they reflect certain aspects of the territoriality of the plantation. It then shows how the energy transition in these islands is structured around their specific status of 'non-interconnected zones'(ZNI) and presents the key features of each island's energy system. Finally, it discusses the potential implications of the energy transitions on the territoriality of the plantation.

4.2.1 Energy Dependency, Fossil Energy and the Making of ZNIs

4.2.1.1. Legacies of the Historic Electricity System

Before the *departmentalisation*, energy infrastructures were relatively underdeveloped in both islands.[32] From the 60s onwards, the State invested in grid development through the national utility company *Electricité de France* (EDF). The rise in living standards led to a rapid increase in electricity demand, which was met by the construction of an electricity system based on fossil fuel imports (Yoann Pelis 2000; Praene et al. 2012). While Martinique turned to oil, Reunion developed its hydropower capacity, which met 100% of the island's electricity needs until 1982 (Praene et al. 2012). Faced with an ever-growing demand, the island supplemented its hydropower capacity with coal and oil sources.

[32] For a more detailed description of the energy systems of Martinique prior to the *departmentalisation*, see the work on Martinique from Ory (2020) and Pelis (2000). For Reunion, the analysis from Beaulieu and Lajoie (2023) provides an overview of the changes that took places from the *departmentalisation* onwards.

The reliance on imports created a situation of material dependency, threatening these islands' energy security. In particular, fossil imports affect the production costs of electricity, which are considerably higher than in mainland France (Garabedian and Olivia Ricci 2018). However, these elevated costs are not passed on to consumers, thanks to the price equalization mechanism. Overseen by the French State's Regulatory Commission for Energy (CRE), this system, created in 2003, compensates energy suppliers for the gap between the cost of production and the regulated price at which they sell energy to consumers. While necessary, this mechanism ties the affordability of electricity in Martinique and in Reunion to financial transfers from the State and the CRE. These islands' energy systems are therefore dependent upon imported energy and its compensation from France, entrenching them in a situation of material and financial dependency.

Sectoral dependency further characterizes Martinique and Reunion's electricity market. A small number of actors dominate the electricity sector, most notably EDF and, to a lesser degree, Albioma. EDF is a historic actor in the French electricity sector, which has managed to maintain a strong position after the market liberalization, particularly in overseas regions. The unbundling of electricity market activities (generation, transmission, and supply) in the EU reduced the central role of EDF in mainland France.[33] In contrast, overseas territories were granted a partial derogation from market liberalization rules, given the challenges they face as small, disconnected markets. In partial compliance with EU requirements, EDF established two subsidiaries: EDF Insular Energy System (EDF-SEI) for the transmission and supply of energy, and EDF Insular Energy Production (EDF-PEI) for electricity generation. This allowed EDF to retain its central position in overseas territories as producer, transmitter, and supplier of electricity. While the grid itself is owned by inter-municipal authorities,[34] they concede the grid management to EDF. This means that the system of financial transfers to

[33] Even though, EDF does remain a powerful actor of the French electricity market

[34] In Martinique : *Syndicat Mixte d'Electricité de la Martinique* (SMEM), In Reunion : *Syndicat Intercommunal d'Électricité* (SIDELEC).

finance prize equalization has been primarily directed at EDF (Rivière and Ducastel 2025). The process relies on information flows between EDF-SEI and the CRE, giving both actors considerable leverage in shaping regulatory decisions (Rivière and Ducastel 2024, 506).

The other main actor is Albioma, formally known as Séchilienne-Sidec. Albioma produces energy in multiple overseas territories. The company has been present in Reunion since 1992, where it produced electricity based on coal and sugar-cane residues (bagasse). In 2007, Albioma entered the Martinican market with an oil-based combustion engine. It further expanded its activities on the island with the opening of a biomass plant (2018) and through the development of solar parks. Due to its use of bagasse, Albioma's activities are closely tied to the sugar cane industry. While EDF remains the historically dominant actor across electricity activities on both islands, Albioma has become a key and growing player in electricity generation, benefiting indirectly from the local influence of the sugar cane sector.

Finally, in Martinique and Reunion the electricity sector is primarily governed by State institutions. The State has historically been the sole legislative body over energy affairs. While being their own institutions with their own directives and cultures, EDF and the CRE are also proxies of state power on the island. Despite the liberalization of the EU electricity market, the French State has continued to remain a large shareholder of EDF, now owning 100% of the company. Consequently, Martinique and Reunion are also in a situation of institutional dependency, whereby state actors and institutions retain power over electricity decisions, marginalizing local energy governance.

The electricity system of Martinique and Reunion is therefore historically characterized by dependency: material (energy imports), financial (compensation), sectorial (market dominance), and institutional (State control). Dependency is a fundamental characteristic of the territoriality of the plantation, of which the electricity system is part. The energy transition in these territories potentially challenges this.

4.2.1.2. The Energy Transition

The renewable energy transition story of French overseas regions starts in Reunion. In 1998, Paul Vergès, then president of the Region, first formulated his visionary agenda to transform Reunion into a green and energy-autonomous island.[35]When environmental and climate issues finally gained greater attention at the national level, the French government reused the objective of energy autonomy and identified French overseas territories as specific places for the energy transition. The 2015 law on green growth cemented the use of the category of *zones non-interconnectées* (ZNIs), which includes insular zones whose electricity grid is isolated from a mainland grid.[36] This category is applied to most overseas territories and some continental islands, emphasizing their lack of connectivity as a defining characteristic.[37] First used in the context of market liberalization provisions, ZNIs also refer to a specific governance category with the French energy transition framework, where specific provisions apply.[38]

Two of them are particularly relevant. First, each ZNI has its own Pluriannual Energy Plan (PPE), a strategic document that sets the priorities and direction of the energy system over several years. Co-drafted by the State and the regional authority, this document opens energy regulation to local governing bodies. Second, ZNIs are assigned different energy transition objectives than mainland France. Regardless of local capacities, overseas territories are asked to reach the same renewable energy target originally set at 50% for 2020, then to 100% by

[35] Paul Vergès (1925–2016) was an influential communist political figure in Reunion, known for his advocacy of autonomy, cultural differentiation, and environmental sustainability. He came from a prominent family with influential political and legal figures in both Reunion and mainland France.

[36] While French Guiana is not actually an island, it is often framed as such due to its relative isolation and the natural barriers that surrounds it (sea and forests).

[37] ZNIs include Guadeloupe, F. Guiana, Martinique, Reunion, Mayotte, Corsica, Sint-Martin, Sint-Barthélemy, Sint-Pierre-&-Miquelon, Wallis & Futuna and the Ponant islands. Although Corsica and the Ponant islands are technically connected to larger grids via undersea cables (to Sardinia and mainland France, respectively), they are still classified as ZNIs due to the limited strength of these connections.

[38] *Loi n° 2000-108 du 10 février 2000 relative à la modernisation et au développement du service public de l'électricité*, *Journal officiel de la République française*, 11 février 2000, https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000763485.

2030.[39]In addition, they are to strive for energy autonomy by 2030. These objectives far exceed national energy transition targets, setting overseas territories apart from mainland France. As such, ZNIs work as a territorial category, delimiting the boundaries of certain policies based on a set of 'territorial qualities', justifying special policies or zones of accelerated development (Bridge 2018, 17).

ZNIs are both a physical and a constructed reality. It is a physical reality insofar as the insularity of these islands does create a greater barrier to their interconnection. However, the lack of regional interconnection also results from the 'fragmented sovereignties' of these regions, where islands were divided between imperial powers (Harrison and Popke 2018). While today the term ZNIs is used to describe the matter-of-fact isolation of these places, their relative isolation and associated dependency are also political. The term ZNI is used to group different places that share similarities but also an array of differences, impacting their energy transition trajectories. The following section discusses the structure of Martinique and Reunion's electricity system.

4.2.2 Multiple Trajectories in the ZNIs: The Electricity System in Martinique and Reunion

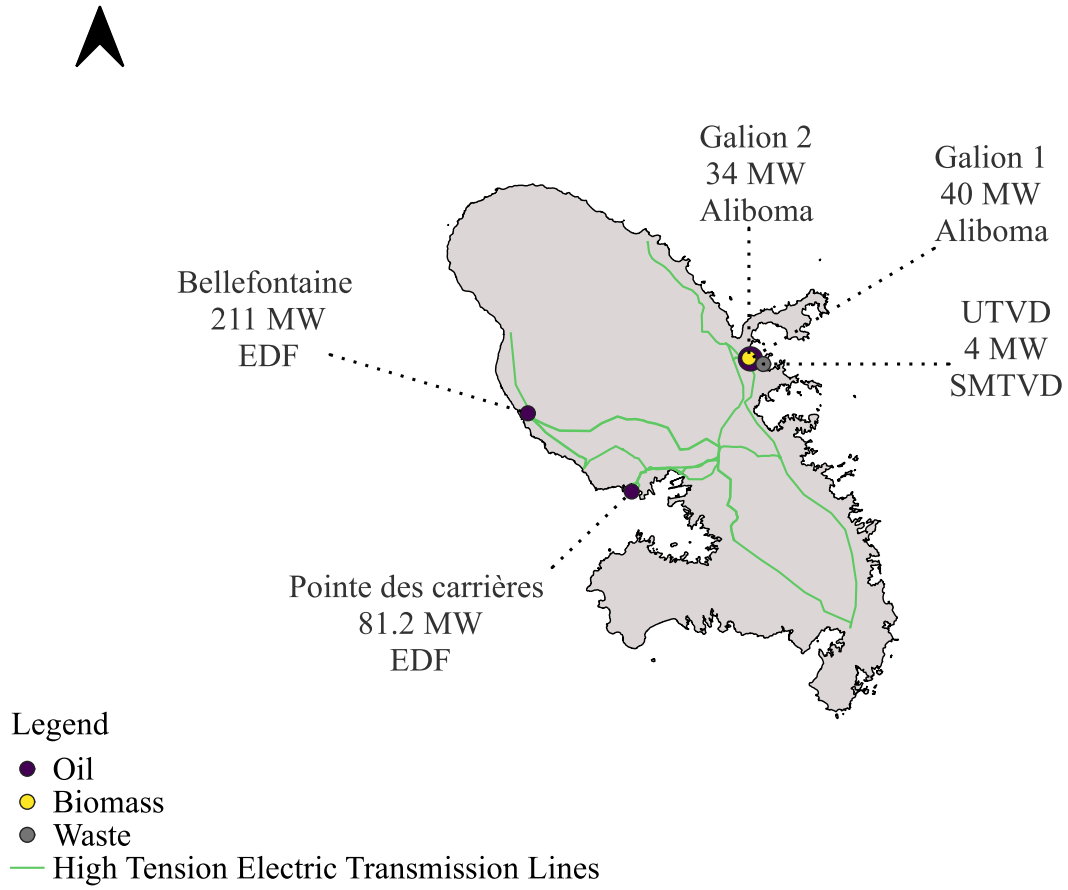
4.2.2.1. Martinique

The primary source of energy consumption in Martinique is transportation (66.6%), followed by electricity (23.8%) (OTTE, 2022). Since part of the decarbonization strategy of Martinique's transport sector relies on electrification, electricity generation is one of the primary axes of the energy transition (Ministère de la transition écologique et solidaire 2018). The demographic decline in Martinique is expected to impact the island's electricity

[39] *Loi n° 2023-175 du 10 mars 2023 relative à l'accélération de la production d'énergies renouvelables (APER)*. Journal officiel de la République française, n° 0060, 11 mars 2023,: https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000047294244

consumption. Indeed, the total electricity consumption is following a downward trend. Nonetheless, the electricity consumption per capita continues to increase (OTTE 2025).

In Martinique, the energy system has mostly been powered by oil. Until 2002, 100% of its electricity was generated by oil imports (Ory 2020), contributing to one of the highest rates of energy dependency among ZNIs, namely 91.8% in 2021 (OTTE 2022). Crude oil is imported from diverse sources (primarily from Norway) and refined locally in Fort-de-France by the *Société anonyme de la raffinerie des Antilles* (SARA) and then partly used locally, as well as in Guadeloupe and French Guiana. It is the only refinery of the French Antilles-Guyana region.



Map 1 Electricity Generation in Martinique, Made by Author (2025)[40]

The production of electricity was previously ensured by two thermal plants powered by Électricité de France (EDF), all located on the western coast of the island (the 'Caribbean' side). One of these plants, in Bellefontaine, was repowered in 2013. These are complemented by on-site oil-fired combustion turbines, which are used during periods of peak demand. Two additional combustion turbines are located on the site of the refinery (SARA), primarily used to meet its own electricity needs.

In the early 2000s, new production units were added to the mix, including a waste incineration facility, the first PV installations, and one wind park in the south of the island. In 2007, the

[40] For clarity, the map only includes the biggest electricity generation units of the island and excludes intermittent forms of energy (solar and wind) and combustion turbines used during peak demand.

production park was complemented by one additional combustion turbine, this time on the eastern 'Atlantic' side of the island, which contributes to grid stability. This station, called Galion 1, is operated by Albioma.

At the beginning of the 2010s, the integration of renewable energy experienced its first significant boost, primarily through the inclusion of solar photovoltaics. A second increase took place in 2018 with the opening of Albioma's Galion 2 biomass plant. This is visible in the figure below, which represents the share of renewables in the electricity mix, with a first increase between 2010 and 2012, and a second one as the biomass plant opens and develops its activities. As of 2024, the electricity mix remains based mainly on fossil fuels, with renewables accounting for only 23.9%.

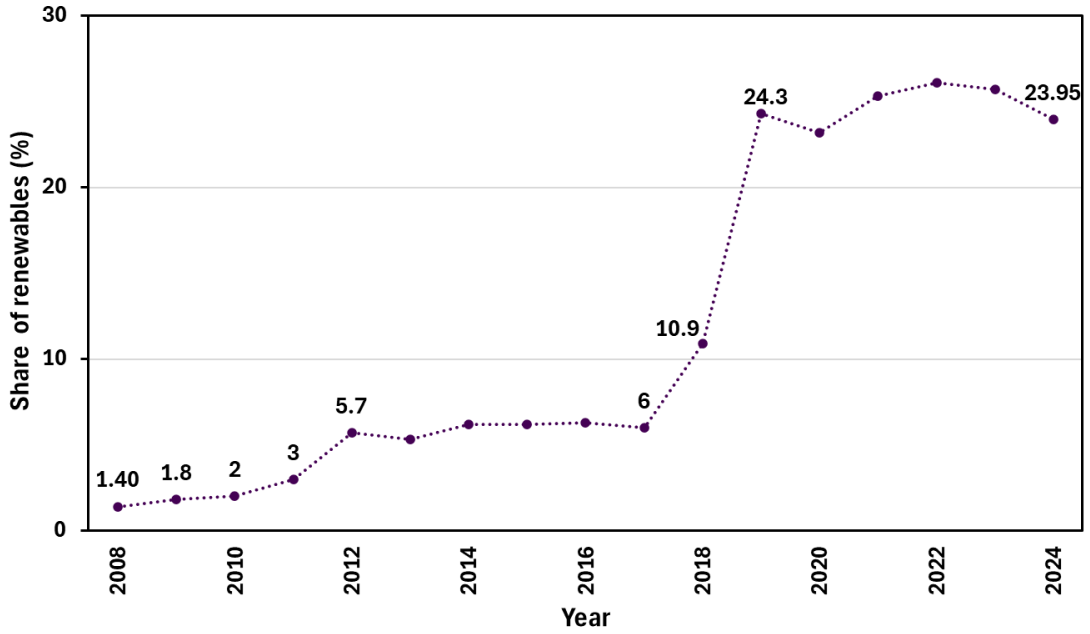


Figure 2 Evolution of Renewable Energy Integration in the Electricity Mix of Martinique, Made by Author (2025), (EDF Open Data Martinique 2025)

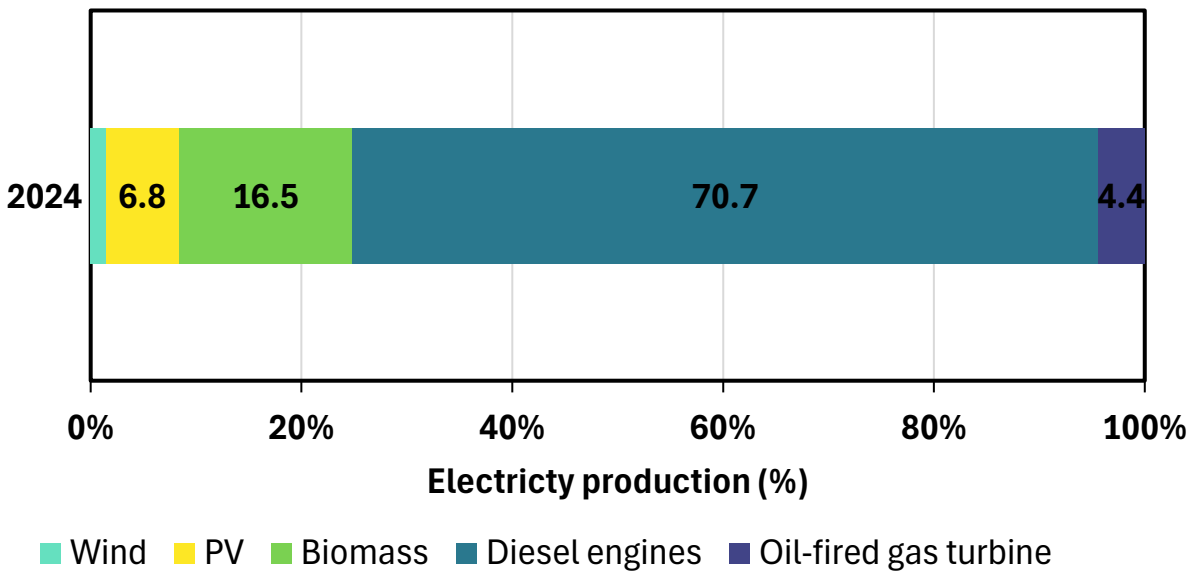


Figure 3 Martinique's Electricity Production per Energy Source in 2024, Made by Author (2025), (EDF Open Data Martinique 2025)

The electricity sector's decarbonization relies primarily on biomass, PV, and wind. Biomass accounts for 66.5% of the electricity produced by renewables (EDF-SEI 2024). The biomass sourced by Albioma comes from two main sources: local biomass, mostly in the form of bagasse, and imported wood pellets. The plant operates in cogeneration with the island's only remaining sugar factory, which provides bagasse during the sugar cane season.

Picture 3 Biomass Plant Galion 2, Picture Taken by Author (2023)

As the contribution of local bagasse fluctuates with harvest quality, the plant relies primarily on imported pellets (OTTE 2022).[41]

Martinique also aims to develop geothermal energy, hydropower, and marine technologies (Ministère de la Transition Écologique et Solidaire 2018). Yet, as of today, none of these energy resources power the energy mix. Instead, the decarbonization of the electricity sector is planned to take place through the conversion of EDF's thermal power plants to imported biofuels by 2033 (AFP, 2023).

4.2.2.2. Reunion

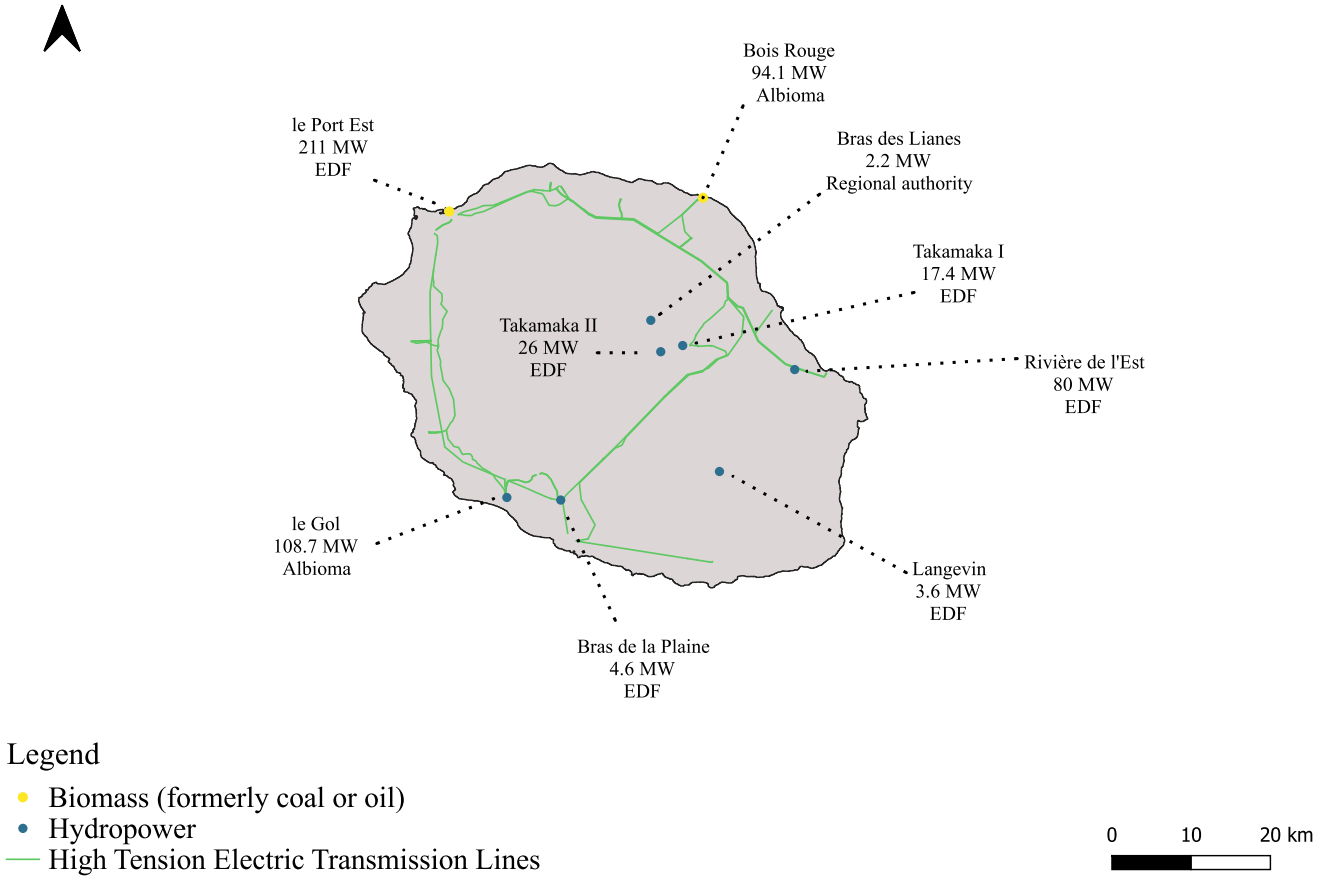
In Reunion, transportation accounts for 64.8% of the total final energy consumption. Also here, electricity generation constitutes the second-largest share of final energy consumption on the island (21.8%) (OER 2024). The electrification of transport is expected to contribute to

[41] Local biomass is estimated to make up around 10% of the biomass used in the Galion 2 plant. Yet no official number or statistic could be retrieved on the exact share of local biomass. https://la1ere.franceinfo.fr/martinique/albioma-galion-2-usine-tourne-craintes-coleres-ecologistes-demeurent-727592.html

an increase in future electricity needs, together with Reunion's growing population (Garabedian and Olivia Ricci 2018; Selosse et al. 2018b; Bénard-Sora and Praene 2018).

Until recently, Reunion's electricity was generated by coal and oil-based power plants coupled with hydropower. Multiple hydropower plants across the island generate electricity, with output levels varying according to climatic conditions. Coal plants worked in cogeneration with the two sugar factories and partly relied on bagasse. EDF and Albioma operate almost all the production units in Reunion.

Picture 4 Hydropower Plant of Takamaka, Pictures Taken by Author(2023)



Map 2 Electricity Generation in Reunion, Made by Author (2025)[42]

Despite the more diverse electricity mix of Reunion compared to Martinique, the electricity sector contributes to high energy dependency levels (84% in 2000) and was, until recently, reliant on fossil sources (OER 2023). As shown in the figure below, in 2008, renewables accounted for 36.1% of the electricity mix in Reunion. This changed drastically from 2022 onwards.

[42] For clarity, the map excludes intermittent forms of energy (solar and wind) and combustion turbines used during peak demand.

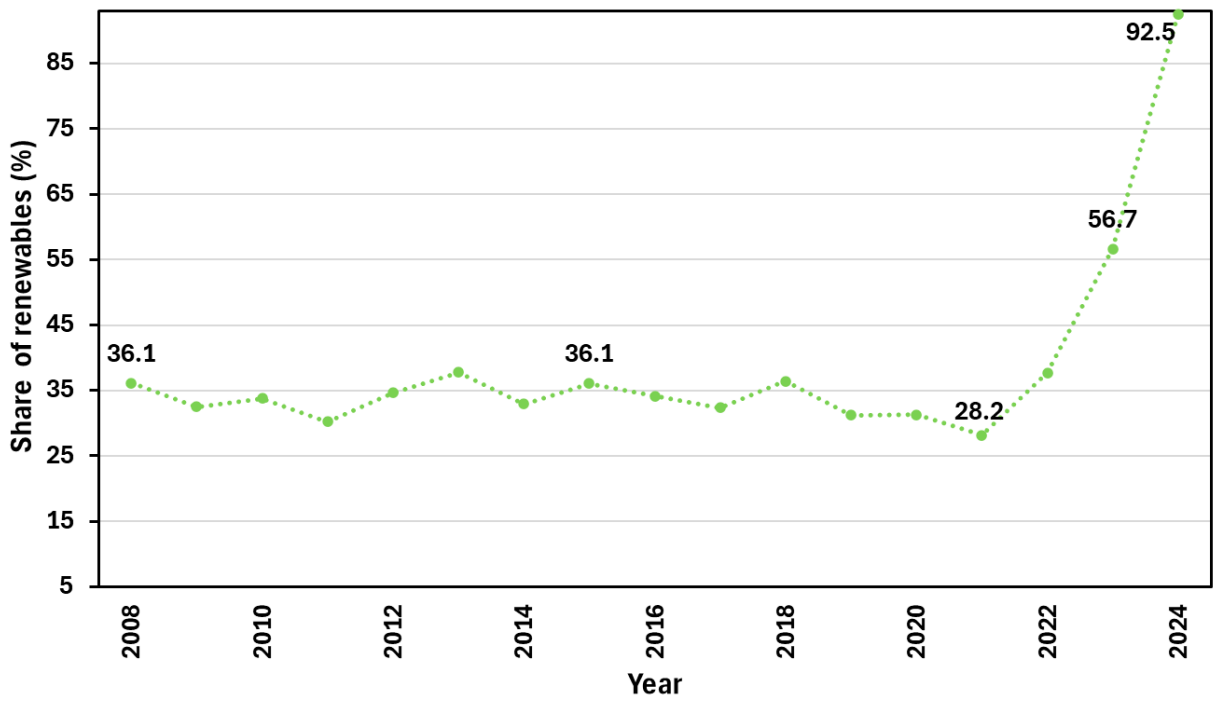


Figure 4 Evolution of Renewable Energy Integration in the Electricity Mix of Reunion, Made by Author (2025), (EDF Open Data Réunion 2025)

This spike is due to the conversion of Albioma's coal-bagasse plants to 100% biomass and to the subsequent conversion of EDF's coal plant to liquid biomass. In both cases, this substitution is primarily based on imported biomass from various origins.[43] EDF facilities rely fully on imported liquid biomass in the form of biodiesel derived from Colza, while Albioma combines bagasse with imported wood pellets (Région Réunion 2020).

[43] EDF sources rapeseed oil from EU countries, Canada and Australia. Albioma wood pellets largely come from North America but alternative routes are under study.

Picture 5 Biomass Plant of Bois-Rouge, Pictures Taken by Author (2023)

In the context of the energy transition, Reunion also diversified its electricity mix to include solar and wind resources. Two wind parks were installed in 2004 and 2005. One has recently been repowered, while the other is currently out of service, awaiting the replacement of its wind turbine. Solar parks are more diffuse on the island, with the bulk of existing capacities installed in the early 2010s. However, as shown in the figure below, wind and solar contribute relatively little to the electricity mix, which is still dominated by biomass, followed by existing hydropower capacities.

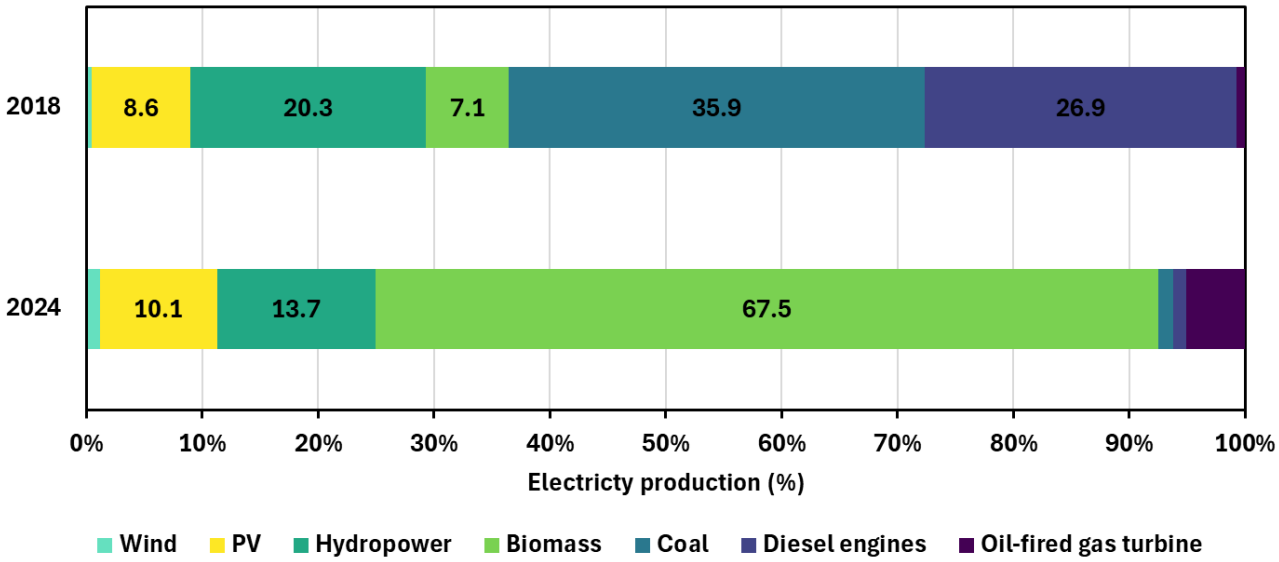


Figure 5 Reunion's Annual Electricity Production by Energy Source in 2018 and 2024 (%), Made by Author (2025), (EDF Open Data Réunion 2025)

Similarly to Martinique, while geothermal and marine technologies are under study, they have yet faced several setbacks and have yet to be implemented in the island.

4.2.2.3. ZNIs and Outermost Regions

The electricity sectors of Martinique and Reunion share characteristics with outermost regions of the EU, which are also characterized by a high fossil and import dependency, due to their lack of interconnection and limited local production capacities (ECORYS 2024; Meirelles et al. 2022; Alves et al. 2019; Ramos-Real et al. 2018). As such, outermost regions have also worked on diversifying their electricity mix. Among them, Reunion stands out in terms of renewable energy integration, together with French Guiana. Both have significant resources of baseload energy in the form of hydropower or geothermal energy. In contrast, Martinique's renewable energy potential is more dispersed and relies mostly on solar and wind energy. Nonetheless, as shown in the figure below, Martinique follows a similar trajectory to other outermost regions such as Guadeloupe and the Canary Islands.[44]

[44] There exist high variations between the islands that make up the Canary Islands.

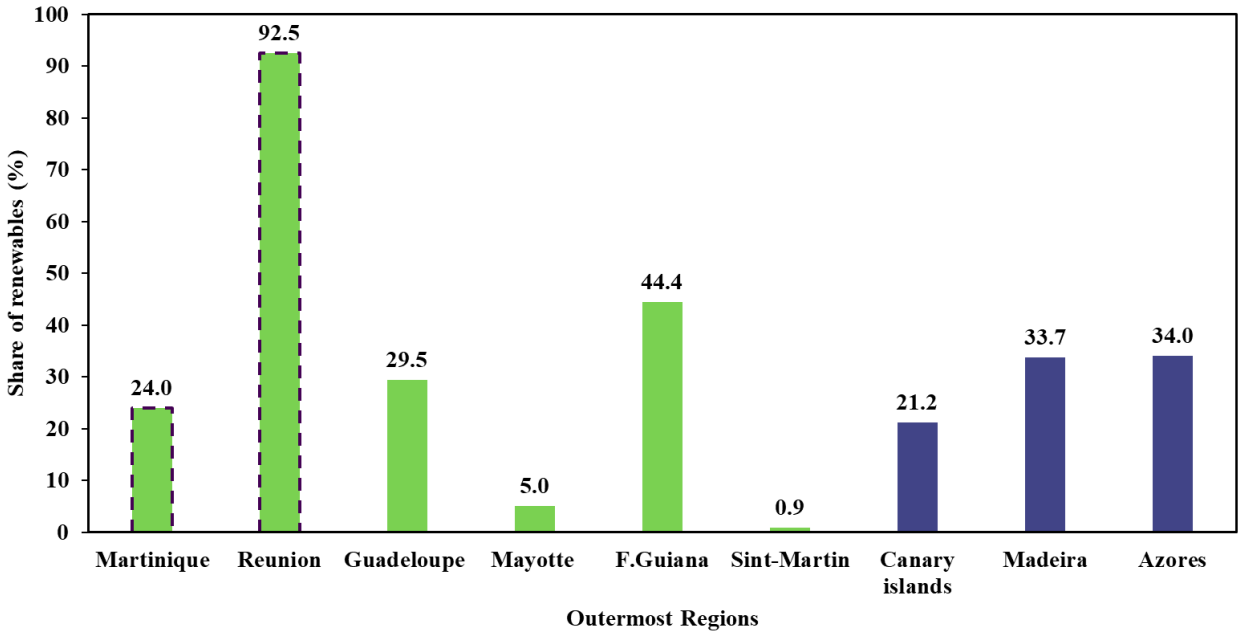


Figure 6 Share of Renewables (%) in the Electricity Mix of Outermost Regions, Made by Author (2025), compilation of sources

Variations among outermost regions and ZNIs are more substantial, with Mayotte and Sint-Martin lagging significantly in terms of renewable energy integration. The French part of Sint-Martin is the smallest region of the group, with a total area of 53,2 km2, resulting in a small, poorly developed grid. [45] In the case of Mayotte, the energy transition is constrained by the island's complex socio-economic context. Recently, Cyclone Chido in 2024 devastated the island's basic infrastructures, pushing the energy transition down the list of priorities. Consequently, variations among ZNIs and outermost regions in terms of their renewable energy trajectories depend on their local energy potential but also on other locally relevant factors of physical, social, and political nature.

[45] Sint-Martin Island is divided in two and governed by France and the Netherlands. The Dutch part of the island is not an outermost region. Both parts of the island have their own, non-interconnected electricity grid.

4.2.3 The Same Solution for All?

Variations among ZNIs have resulted in different paths and varying success rates in reaching energy transition targets. However, after more than ten years of developing wind and solar energy, both Martinique and Reunion now adopt a similar decarbonization approach: replacing fossil fuels with biomass resources. By anchoring the biomass transition on imported resources, EDF and Albioma undermine energy autonomy and deepen existing dependencies. This questions whether the transition can truly break free from the traditional territorial patterns of the electricity system. Still, the development of land-based renewables like wind and solar intersects with local agricultural land use and ownership patterns shaped by the legacy of the plantation system, and as such, can either reinforce or challenge the existing territorial organization of these islands. Additionally, using land for renewables can also run counter to food autonomy ambitions and thus reinforce another form of material dependency.

4.3. Conclusion

This chapter presented Martinique and Reunion through the lens of their territoriality: the internal and external attempts at defining and controlling these places over time, extending to their electricity system. The plantation legacy remains visible today in patterns of structural dependencies, land use structures, and persisting inequalities.

The territoriality of the plantation is further reflected in the organization of the electricity sector, characterized by its specific categorization into ZNIs, energy dependency, and the external governance and dominance of a few actors over the electricity market. In this context, the energy transition has the potential to alter existing territorial arrangements, either by reducing dependency and reshaping resource and land-use patterns or by reinforcing the territorial logic inherited from the plantation.

Both islands are transitioning from fossil-fuel-based electricity systems to renewable energy, albeit with varying degrees of success. Yet, their current strategy relies predominantly on imported resources, which runs counter to their ambitions for energy autonomy. The following chapters of the dissertation explore why this shift is taking place.

Part II: The Islands and France

In this second part, the dissertation primarily examines the implications of the energy transition for Martinique and Reunion in terms of their relationship with the State and their position within France. It does so in Chapter 5 through the investigation of the discourse on the energy transition *in* and *about* these islands.

5. What is The Energy Transition For? Imagining the Transition in Reunion and Martinique

5.1. Introduction

The renewable energy transition in Martinique and Reunion aims to achieve two objectives: energy autonomy and decarbonization. The objective of energy autonomy originates from the Reunionese context, embodied by the visionary political agenda of Paul Vergès, a prominent communist and autonomist political and intellectual figure of Reunion. His vision for a green and autonomous island is then later co-opted by the State and diffused to all non-interconnected zones (ZNIs), including Martinique. Meanwhile, decarbonization is closely related to broader debates around climate change, which extend beyond Martinique and Reunion, where the ambitious target of 100% renewables by 2030 is set. This chapter discusses the purposes these objectives serve and the local transformations they are intended to bring about, particularly in light of the recent shift to imported biomass, which challenges energy autonomy.

Energy transitions are embedded within existing imaginaries and contribute to the materialization of alternative territorial futures (Hommes et al., 2022). Existing research has established that energy transition discourse about islands often draws on preconceptions about

islands to position them as prime sites for technology development (Mela 2023; Skjølsvold et al. 2020; Roche et al. 2018). Applied to the cases at hand, Roche et al. (2018) find that innovation and technologies are central to the energy transition ambitions of French overseas regions. However, why this is the case, for what ultimate purpose, has yet to be analyzed. In other words, while we know that island imaginaries are an integral part of the energy transition discourse, we have yet to explain what role they play in the accomplishment of different territorial projects. In Martinique and Reunion, territorial questions around the level of integration and dependency from France have been debated for decades. Energy control is central to territorial sovereignty and can therefore be challenged by the energy transition and its different trajectories (LaBelle 2024).

This chapter examines how the energy transition discourse is constructed, around which imaginaries, and which territorial projects are being promoted through it. It identifies two main territorial projects emerging from dominant imaginaries of the energy transitions. The first one prescribes transforming these islands into laboratories, revalorizing their position within the State and France's international standing. The other promotes the development of an autonomous and self-reliant island, free from dependencies.

These visions entail different types of relationships between the islands and the State. By envisioning Martinique and Reunion as a display of French innovativeness or as autonomous and self-reliant islands, the energy transition discourse re-enacts the historical debate over the degree of autonomy of these islands and their role as French territories. These territorial projects ultimately have different implications for the structural dependencies of the electricity sector (Chapter 4).

Despite advocating for opposite territorial projects, these imaginaries share a similar developmentalist agenda by failing to question the logic of ever-greater energy consumption which drives the dependencies of the energy sector. This ultimately limits the transformative

power of the energy transition. Nonetheless, these are contrasted by counter-voices in Martinique, which offer the premise of an alternative to the current energy transition paradigm.

The analysis relies on three types of data: textual content, interviews, and observation notes. The textual corpus comprises a variety of sources, including political speeches, reports, planning documents, and news reports generated between 2007 and 2024 at both local and national levels, addressing either case studies or ZNIs in general. These were analyzed alongside a sample of 42 interviews selected from the total conducted. This sample corresponds to the type of actors under investigation in this chapter, namely those who hold relative power and can influence the direction of energy transitions in their specific locality, thereby participating in the creation of a dominant discourse.[46] Nonetheless, the chapter also contrasts dominant imaginaries with counter-voices found at the margins of power. This combination of texts, transcripts and field notes was analyzed following a thematic analysis approach and guided by the concept of spatial imaginaries as developed by Watkins (2015).[47]

5.2. Imaginaries of the Energy Transition

Spatial imaginaries can either describe places or prescribe how they ought to be. Drawing on Watkins' (2015) conceptualization, I distinguish between descriptive and prescriptive imaginaries to structure the analysis.[48] Descriptive imaginaries, *space and place imaginaries*, work as building blocks for the energy transition's discourse. These are used to form *spatial transformation imaginaries* that reflect particular *territorial projects*, visions of territorial change. The figure below illustrates the relationship between various types of imaginaries.

[46] Explained in more detail Chapter 3, the analysis focused on identifying mainstream, dominant imaginaries generated by actors who hold a relative 'power to imagine' and to implement desirable futures (Kuchler 2017). This includes actors in governance, the private sector, and the media. I also include interviews and data from the Association of ASSAUPAMAR, which does not represent the 'dominant' paradigm of thought, but nonetheless exerts power over the energy transition.

[47] The methodological approach is discussed in more detail in Chapter 3.

[48] For more details, refer to the analytical framework (Chapter 2)

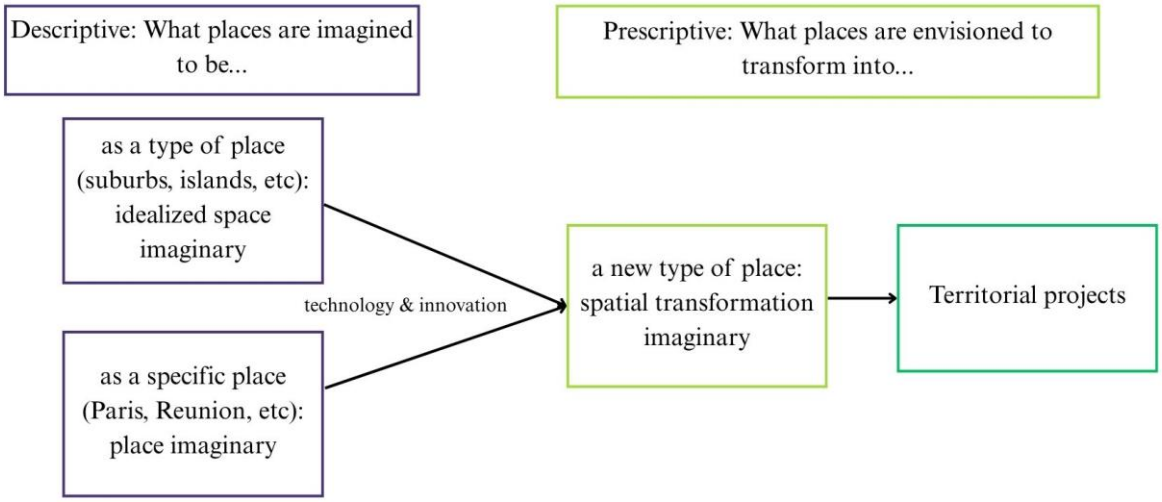


Figure 7 Descriptive and Prescriptive Imaginaries, Made by Author (2025)

In both cases, spatial imaginaries are interlinked with visions and ideas attached to technology and innovation, and the role they play in achieving desired futures (Chateau et al. 2021). The next section presents imaginaries used to frame Martinique and Reunion as special places for the transition. The section that then follows discusses the territorial projects they entail.

5.2.1 Exceptional Places for the Energy Transition: Islands and Technology

5.2.1.1. The Island Paradox: Vulnerability and Abundance

Two seemingly paradoxical narratives support the objectives of energy autonomy and decarbonization. The first highlights the islands' structural vulnerabilities and dependencies, framing the energy transition as a necessary response to these challenges. The second, by contrast, emphasizes the islands' natural and cultural assets, portraying them as ideal sites for leading the energy transition. These are drawn from common island imaginaries, which frame islands as exceptional places in negative and positive terms.

Vulnerability

Islands are commonly described as structurally disadvantaged because of their small size and remoteness. At the beginning of energy transition efforts, public discourse emphasizes the smallness of these islands, which consequently lack energy production capacities. Islands' conventional energy resources are scarce or non-existent. Their remoteness and lack of interconnection deepen such scarcity: "how can electricity be produced without fossil fuels when there is neither a nuclear power plant nor neighboring countries to import from if needed?" (cNat4, media).

Scarcity and lack of interconnection lead to dependence on fossil imports, making these islands vulnerable to price swings and supply instability. In the event of a global crisis, energy dependence significantly threatens their ability of these islands to function. The energy transition, and in particular energy autonomy, is seen as necessary in the event of a 'major crisis,' as the islands have previously faced during shortages in World War II. Today, risks include geopolitical crises that affect global supply chains and natural disasters that damage local energy systems. Interviewees cite recent disruptions to supply chains caused by the COVID-19 pandemic and the war in Ukraine to highlight the vulnerability of their islands to such risks. The following quote illustrates the link between risks and dependency:

> "We saw that during COVID there was no transport, we couldn't feed ourselves. Then there was the war in Ukraine, so prices skyrocketed, and imported raw materials exploded […] The energy transition, is linked to that too. So that if tomorrow something happens elsewhere in the world… Well, we're kind of masters of our own development if we're not dependent on others*."* (IntMA23, solar energy developer).

Risks associated with value chain disruption and energy dependency are seen as cumulative to other dependencies and structural deficiencies, making the island vulnerable to climate vulnerability, underdevelopment, broader material dependencies, as well as demographic pressures or declines.

The demographics of the islands are considered significant factors driving the need for an energy transition. In Reunion, longstanding concerns over the increasing population are used to highlight the stress on the island's energy system.[49] While in Martinique, which experiences demographic loss, the narrative is inverted, with some interviews referring to the role that the energy transition could play in preventing youth migration to mainland France.

Finally, the higher cost of electricity generation in overseas regions is seen as a risk factor. Interviewees raised concerns about the overall affordability of electricity, which relies on financial transfers from France (the price equalization mechanism), a system that could always be withdrawn.

Explanatory Note: The price equalization mechanism ensures that consumers in ZNIs pay low prices, despite the high production costs. The mechanisms rests on a public tax paid by all French consumers on their electricity bills and then redistributed to electricity distributors (EDF-SEI in Martinique and Reunion). First introduced in Chapter 4 and in the glossary.

As described by this interviewee from Martinique:

> "Tomorrow, if we project ourselves into the very long term, we don't know if there will always be the CSPE, or whether we'll end up being unable to manage our production within the territory" (IntMA21, civil servant, regional authority (CTM)).[50]

As such, in Martinique and in Reunion, the energy transition is framed as a matter of survival in material, economic and societal terms. In this context, climate change mitigation does not appear to be the prime motivation for the energy transition in these territories but rather one element among broader concerns. While climate change is often mentioned as a factor in discussions about the energy transition, its urgency is sometimes perceived as secondary in comparison to local challenges. This quote adequately expresses the distinct priorities at play in such settings:

> "Global warming, pollution, all that, clearly, it's not my problem. I'm sorry to say this, but it's not my problem, it's not Martinique's problem, and we're not responsible for

[49] Estimated to reach 1million by 2050, concerns over the island's demographics are already present in the post-departmentalization period, leading to the implementation of emigration programs (BUMIDOM), forced adoption, and birth control policies, as well as the unofficial practice of forced sterilizations and abortions (Vergès 2017). Therefore, demographic control is also associated with racist colonial policies in the 'postcolony'.
[50] CSPE (Contribution au Service Public de l'Électricité) is the former acronym of the mechanism in question.

> all that. That's the first point. Now, there's a reality: hydrocarbons will disappear one day or another, so it would be good to find another way of doing things. And it's true that taking responsibility and moving toward food or energy autonomy makes sense to limit our impoverishment. It's also true that we could have local energy that's cheaper than other sources, so economically, that matters, the same goes for food." (IntMA7, employee, public authority for electricity distribution).

Therefore, the accumulation of vulnerabilities (material, socio-economic, and environmental) and the need to survive in an evolving world shape the discourse around the energy transition, framing islands and ZNIs as places where the energy transition is vital.

Abundance

Beyond vulnerable places, Martinique and Reunion, as tropical islands, engage western imaginations as places gifted with abundant sunlight, surrounded by the ocean, and host to tropical forests and waterfalls. These very elements are constitutive of the energy transition discourse of Martinique and Reunion as their "natural advantages" (cNat42, Nicolas Zarkozy, speech), ranging from Martinique's 4130 Wh/ m² of sunshine (cNat24, media) to Reunion's "unique hydrometry in the world" (cNat2, media), justify the exploitation of renewable resources. This is presented as natural and rational; "it would be a fundamental mistake not to make full use of this massive, universally available, and free resource" (cZNI57, Victorin Lurel, speech).

National media coverage tends to romanticize the natural landscapes of these islands and the resources they are presumed to contain. For example, the newspaper *La Croix* introduces the energy transition in Reunion by describing it as a "paradisiac island, inhabited for three hundred and fifty years, this eruptive piece of land in the Indian Ocean, less than a third the size of Corsica, is a concentrate of the planet's upheavals" (cNAT16, media).[51] Similarly, *Le Figaro* depicts the island's hydroelectric infrastructure as embedded in a "tropical emerald-green jungle," where "everything is dizzying" (cNAT2, media). These portrayals reinforce the

[51] La Croix is a Christian news outlet.

idea of overseas territories as not only sites of abundant natural energy but also as exotic and dramatic backdrops to the energy transition.

Along with the geo-physical characteristics of the islands, the energy transition discourse also mobilizes the societal qualities that these places offer. Particularly at the beginning of the transition efforts, these islands' ethnic heritage, their *métissage*, are used to argue that for their ability to showcase, at a smaller scale, how global challenges unfold and how to solve them.[52] Martinique, Reunion and other overseas territories are therefore presented as places with ample natural and social resources to be valorized by the energy transition.

5.2.1.2. Technology

Positive (abundance) and negative (vulnerability) framings of islands are intertwined with ideas about technology and innovation. The natural wealth of islands supports a narrative that not only justifies exploiting their renewable energy resources but also positions them as testing grounds for renewable energy technologies. The first national legislative text on the energy transition in 2009 identifies overseas territories as specific "experimental frameworks for sustainable development" due to their "environmental characteristics and the wealth of their biodiversity" (l1; art1). The abundance of resources in these territories and their insular qualities ought to be valorized and exploited through technological development.

National visits by ministerial figures (Ségolène Royal, Jean-Louis Borloo, Nathalie Kosciusko-Morizet) and presidential figures (Nicolas Sarkozy) to these islands often employ this framing. During her 2014 visit to Martinique, Ségolène Royal emphasized the island's potential for energy innovation, describing the necessity "to valorize the situation of a tropical island territory" and to turn it into "a privileged site for demonstration and experimentation" (cNAT33, media). This is also reflected in press articles and reports about the energy

[52] This diversity of ethnic backgrounds is directly related to the colonial history of these islands, as different groups of people were brought to work on plantations, first as slaves, then as indentured workers.

transition, where the case studies are presented as a “laboratory of the new energy model” (cMA60, media), or “EDF’s laboratory” (cRUN8, media), “an ideal place for demonstration and experimentation” (cNAT33, Ségolène Royal, speech) or “laboratory for our future” (cNAT43, media).

Other key properties associated with islands serve to frame Reunion and Martinique as ideal experimentation grounds. Smallness, boundedness, and isolation are used to highlight the manageability of these insular electric systems, the ability to control the grid, but also test the 'direct effects' of different technologies on the grid:

> “The island's insularity makes it a good laboratory for testing the integration of sustainable development on the scale of an entire society, despite its smallness” (interview with representative of the French development bank, cNAt41).

Finally, the social qualities attached to islands, and to Reunion in particular, further construct the laboratory island trope. Reunion’s “cosmopolitan population made up of descendants of European sailors and settlers, former African slaves and migrants from India and China” (cNAT16, media), is framed as a microcosm, a concentration of the world’s problems. As such, Reunion is “a good laboratory for testing the integration of sustainable development on the scale of an entire human society, however small it may be” (cNAt41, media). This vision of the Reunionese population as special sets the island as a pioneer and precursor of innovative change for sustainable development. Its “young, mixed-race population”, ‘pioneering spirit’, “natural capacity to adaptation” (cRUN39, regional authority), combined with a “dynamic socio-economic research and innovation sector" (cRUN44, media), position Reunion to become, “a benchmark in France and a benchmark in the world in this part of the Indian Ocean” (French president Nicolas Sarkozy, cNat42, speech).

Such place-specific conceptualization is less common in the case of Martinique, where the innovation discourse is nonetheless present, but seemingly as an extension of the discourse

from the ‘pioneer’ region of Reunion to other territories. As such, particularly at the outset of the discourse, Reunion is singled out as a special case among overseas territories, themselves already differentiated as ZNIs. This perception was reflected in some interviews conducted in Martinique, as interviewees pointed out Reunion as an example. Both in Martinique and in Reunion, this led to the promotion and experimentation of a range of marine technologies at the beginning of the 2010s, supported at national and local scales. In Reunion, the project GERRI “Green Revolution for Reunion Island” was also explicitly put together to develop an ecosystem of energy innovation in the island.

Through its reliance on the ‘island paradox’, the energy transition discourse is grounded in a set of spatial imaginaries commonly associated with islands. References to remoteness, isolation, and abundance are all reflective of what Watkins (2015) would understand as 'idealized place imaginaries', imagining islands as specific kinds of places where exceptional things happen (Mountz 2015). In particular, the insularity of Martinique and Reunion is used to link these places to innovation and technology development. Within this discourse, Reunion benefits from its own place imaginary, as Reunion is framed as special among overseas territories.

The renewable energy transition discourse emphasizes these territories' differences from mainland France by specifying and outlining the key characteristics that set them apart, thereby justifying specific energy targets in a highly centralized State. The naturalization of overseas territories as ideal locations for the energy transition that ensues serves as a basis to argue for the transformative power of the energy transition in these territories. The energy transition discourse eventually draws on the island paradox to convey imaginaries of spatial transformation, whereby the renewable energy transition is seen as a tool for realizing desirable futures and alternative territorial projects. The following section describes which territorial projects these imaginaries serve.

5.2.2 Transformation Through the Energy Transition: Territorial Projects

From the onset of the discourse, media and political speeches frame the energy transition as a 'revolution,' a transformative tool not only for energy systems but also for overseas regions themselves. But what should this revolution look like? Two dominant answers to this question coexist, each conveying a different territorial project, or spatial transformation imaginary. The first envisions Reunion or Martinique as laboratories for renewable energy development, serving as a showcase of French innovation. The second advocates greater material, financial, and eventually political autonomy to be gained through the renewable energy transition. Both draw from the lexicon of the island paradox (vulnerability and abundance) and overlap in their focus on development and technology. Yet, they advocate for opposite territorial projects, grounded in historical debates over the relationship between these islands and the State. Each project also has different implications for the types of energy transition trajectories it supports and their ability to reduce the structural dependencies of the electricity sector.

5.2.2.1. Laboratory Islands

The Reunionese Paul Vergès, at the initiative of energy autonomy in Reunion, often promoted the energy transition through the use of laboratory analogies in some form of marketing exercise. From a “sustainable development laboratory” to a “small laboratory for the world's problems” (Paul Vergès, cNAT16), Reunion ought to play a central role in the energy transition beyond the confines of the island. This analogy becomes relatively popular and is widely reused across the energy transition discourse *in* and *about* ZNIs. Yet, its use is not neutral and participates in the creation of a particular territorial project for the islands' future, somewhat misaligned with Paul Vergès’intentions. Under this narrative, the energy transition in Martinique and Reunion serves three main purposes: to contribute to the international

image of France and open new energy markets for its industries, to revalorize these islands as special (and useful) places within France, and to contribute to these regions' economic development.

The laboratory imaginary portrays innovations developed in overseas regions as beneficial to France as a whole, either through the ability of technologies to be scaled up or for Reunion and Martinique to act as *vitrine*, a display of French technological advancement. As such, knowledge extracted from these places can be used for external benefit. The predicted success of overseas regions to transition and to become technological development hubs should contribute to "France's international commitments, showcasing these exemplary regions to promote France's image and influence" (Minister for overseas territories, cZNI57, speech). An ambition repeated across texts, as illustrated by this quote found in a national report:

> "…the challenge is to make each of these overseas entities a showcase for the most modern techniques, which could be offered to other territories in similar geographical conditions" (cNAT43, governmental report).

The testing of energy technologies in overseas regions, such as marine technologies, is perceived as an opportunity for France to develop "new industrial opportunities in the renewable energy sector" (Minister for overseas territories, cZNI57, speech), which it could not have developed on the continent due to a lack of suitable conditions.

The 'laboratory island' trope supports these framings as technological innovations, and their scalability for France and the rest of the world is promoted. This conceptualization is generated both at national and local levels, particularly at the beginning of energy transition efforts. Yet for local policymakers, it often takes the form of a marketing exercise, which valorizes the position of the overseas territories within France and on the international stage. In the interviews, the idea that their island can become a 'technological hub' persists. In contemporary local discourse, the idea of the laboratory and places of experimentation is

primarily used by energy developers, insisting that their presence in local settings helps them to develop innovative, scalable solutions:

> "Islands remain small experimental zones within larger territories. Any issue we encounter on an island is likely to gradually appear in larger territories like the mainland. Being at the heart of their development, therefore, also allows us to gain valuable technical expertise, so that we can later have strong arguments to support development in other territories" (IntMA48, solar energy developer).

Thinking of Reunion and Martinique as laboratories contributes to the revalorization of overseas territories, moving from underdeveloped, dependent, and in need of assistance to prime sites of technology and innovation.

> "For the overseas territories, it is no longer a question of catching up with a model that is running out of steam but, on the contrary, given their assets in renewable energies such as the sun, the wind, and the power of the seas, of anticipating and even getting ahead of the model change for which green growth must be the driver throughout the country. In these territories where one in two young people is currently inactive, I deeply believe that such a turnaround will create new activities and sustainable jobs and will inspire renewed hope." (French Minister, Ségolène Royal, speech, cNAT82)

Through the energy transitions, we are told, overseas territories that concentrate social and natural vulnerabilities can be "more than a place of lament, it can be a place of experimentation..."(cNAT16, media). The energy transition is supposed to enable local 'economic and social development' (cNAT37, governmental report), and act as 'leverage' (cMA29, media) for 'green and blue growth' (cMA29) through the creation of innovative sectors. This is supported by references across texts and interviews to the relationship between energy and development, its perceived ability to create local employment opportunities, and a dynamic economy. In Martinique, new jobs created by the renewable energy sectors are also seen as a means to "bring back graduates" (IntMA21, civil servant, local authority) to Martinique after their studies in mainland France.

This narrative echoes historical framings of French overseas regions as places of experimentation and to be developed. In the decades that followed the *departmentalisation*, France's investment in developmental policies used overseas regions to demonstrate "the

power of Western achievements, the ability to travel through time and accelerate development" (Holstein 2014, 12). While in the 1960s, roads, hospitals, and electricity infrastructures ought to participate in France's *rayonnement,* today, the energy transition should showcase France's state-of-the-art technology.[53] The development laboratories that were these islands at the onset of the Cold War are now transformed into experimentation grounds for *sustainable* development or "showcases of French excellence in eco-development" (cRUN8, government report).

Overseas regions are once again portrayed as *vitrines*, revalorizing their status within France while benefiting France's international image. It is an opportunity for France to utilize its overseas regions, and for islands like Martinique and Reunion, the chance to be recognized as special and strengthen their economic development. The territorial project presented here is in continuity with the project of political assimilation, which, despite highlighting these places as special, reclaims their *belonging to* France and their *usability by* France. In this context, reducing dependencies by achieving greater levels of energy autonomy is peripheral to the 'laboratory islands' project.

5.2.2.2. Autonomous and Self-Sufficient Islands

In contrast, the 'autonomous islands' project depends on achieving energy autonomy and reflects emancipatory inspiration from France. This narrative begins with two premises: the first is that Martinique and Reunion are vulnerable to risks that could invalidate their ability to function, and the second is that this vulnerability is exacerbated or even induced by the structural dependency of their energy, economic and governance systems.

The islands' vulnerability to external shocks is used to argue for the importance of building local energy capacities, ensuring that the islands' material energy needs are met in the event of

[53] Rayonnement in French can be translated to radiance, and refers here to the international influence, its image on the global stage.

a crisis. Energy autonomy, by relocating energy production, could insulate the islands from global market fluctuations and external disruptions, ensuring, at least for a time, consistent access to energy. Beyond the increased resilience to shocks, by leveraging local energy capacities, new energy-related jobs and investment could strengthen the local economy, enhancing its ability to function independently:

> "The issue of energy, therefore, represents a crucial development challenge, particularly for island economies that are completely dependent on external supply. Martinique must make the most of the clean and sustainable energy sources it has at its disposal: photovoltaics, wind power, tidal energy, geothermal energy, etc." (cMA54, media)

Development, enabled by the energy transition, ought to be endogenous as islanders should strive "to achieve economic development by our own means" (IntMA23, solar energy developer) and "local development and economic growth"(cRUN65, regional authority report). The local anchorage of companies and the creation of local benefits are opposed to profit-making by external actors and hegemonic actors in the industry. By fostering a local economy and energy system disentangled from existing dependency relationships, energy autonomy is poised to enhance self-reliance, inherently linked to local capacity development as articulated in this interview:

> "More individual and collective responsibility [...]will enable us to be taken seriously in our relationship with the French State. When I talk about collective responsibility, we're really talking about autonomy and independence [...] we have to become aware of ourselves." (IntMA7, head of development at the public authority for electricity distribution)

Developing local energy capacities offers a pathway to transition away from a status of dependency on France and global value chains to a self-reliant system, one over which local authorities can exert greater control. This includes shifting away from a model:

> "where we bring in resources from elsewhere, based on an economic model imposed on us, over which we have no control, and so the only way to be resilient is for the French State to subsidize." (IntRUN10, civil servant departmental authority).

Energy autonomy is seen as a way to evade this "*économie de comptoir* that maintains and generates dependency on energy, food, industry, et cetera."(IntMA46, Member of the Parliament).[54] While stakeholders emphasize the necessity of price equalization, this mechanism is simultaneously seen as a risk: a further dependency that, if removed, could severely jeopardize the viability of basic services on the islands, thereby hindering their ability to achieve self-reliance. Therefore, energy autonomy is an opportunity to develop an endogenous economic activity that would not be 'over-subsidized' (IntMA30, civil servant, local authority), in contrast to the current energy system. As such, the autonomous island project questions several aspects of the axes of dependency (material, institutional, sectoral and financial) of the historic energy system in these islands (Chapter 4).

This imaginary considers that technology and innovation capacities can contribute to the creation of self-reliant islands, where technologies are not just tested and then scaled up, but also contribute to a local research and innovation ecosystem. This vision builds from a critique of the laboratory narrative, which is both perceived as problematic and erroneous. It is problematic due to its 'colonial ecology' undertones (IntMA46, Member of the Parliament), its tendency to view islanders as 'passive' and their island as a 'container' (IntRUN24, research and innovation policy officer, regional development agency). A laboratory, after all, is used to test solutions that would be applicable outside of experimental settings. Yet, "in a laboratory, we can fail" (IntRUN26, EDF-SEI), which at best affects the quality of electricity distribution and at worst impedes these territories' ability to engage in a timely transition.

In practice, some technologies developed in Martinique and Reunion have indeed failed to be implemented, resulting in distrust in innovative projects, as "so many pharaonic projects come and go, most of which never come to fruition" (cRUN10, media). This is illustrated by the

[54] The term 'Économie de comptoir' is often used to qualify French overseas territories and refers to a colonial economy structured around an import dependency and a local production that is exported, with little local decision power.

multiple attempts at developing marine technologies, particularly ocean thermal projects, in both Reunion and Martinique. The following quote from an energy policymaker in Reunion illustrates the dissatisfaction with the laboratory island:

> "Reunion is not a laboratory. Reunion is a land of progress. It's a land of social progress; we're not here to experiment with things that will be implemented elsewhere. I completely disagree with that expression and try to avoid it at all costs. We can be a land for the large-scale development of solar energy. But we've already had several failed tests, that's enough. Take thermal energy, for example, or the attempts at wave energy. We had two tests, involving a lot of money from the regional authorities. For whom? For the whole world?" (IntRUN4, Regional Councilor for Energy)

By referring to Reunion as 'a land of social progress', this interviewee does not discard the idea of innovation entirely; rather, he redirects the purpose and content of innovation, focused primarily on developing local societal solutions to climate challenges. This idea is shared by actors across the energy governance in Martinique and Reunion who consider that the innovative potential of these islands lies rather in devising new forms of governance and innovative solutions adapted to local needs.

Given these considerations, these territories have engaged in a process of "technology transfer" (IntRUN2, national agency for the environment) rather than innovation. As expressed by this energy policy official, in Martinique:

> "We only deploy technologies that are well-established for industrialization, truly mature, and capable of providing a direct solution. On the contrary, we've never really seen technologies or projects that are entirely innovative" (interview DEAL MA).

Therefore, by the end of the period under analysis, greater importance is given to 'mature technologies'; the times are no longer at testing but at providing reliable technologies that can contribute to energy autonomy. Therefore, the objective of energy autonomy encompasses transformative ideals which ought to transform dependent, inefficient and risk-prone places into autonomous and self-reliant islands. According to this vision, energy autonomy is viewed as a critical step in gaining greater autonomy in general through the development of local capacities to reduce dependencies in material, sectoral, financial and institutional terms. As

such, energy autonomy also generates a political reflection on the ability of these islands to be self-reliant, a historical debate in overseas regions.

Historically, proponents of political autonomy in these islands have conceived development as conducive to the empowerment or *responsabilisation* of overseas regions in opposition to the 'heteronomous development' project proposed by the State (Holstein 2014; Labache 2017; Manglou 2024). Today, the emphasis on the energy transition to achieve greater autonomy and self-reliance resonates with autonomists' concerns regarding local capacity development, responsibilization, and the need to curb dependency relationships.

In this light, the autonomist origin of the energy autonomy ambition is hard to ignore, despite its later co-option by the State and diffusion across political affiliations. While on the surface, energy autonomy is articulated in terms of survival in the face of global changes, at a deeper level, its implications are political. By generating greater material autonomy and self-reliance, energy autonomy, if enacted, eventually calls for the reorganization of the economic and governance models away from dependency relationships. Therefore, the two imaginaries are reflective of the historical question of the role of these islands in France and whether they should tend towards more autonomy. While the laboratory framing reinforces these islands' association with France, the other advocates for greater autonomy from the State by fostering material and financial self-reliance. The table below presents a comparative overview of the key dimensions that differentiate each territorial project.

Table 8 Territorial Projects Reflected in the Energy Transition Discourse

	Laboratory	**Autonomous islands**
Description	Testing ground for energy technologies to be replicated elsewhere.	Energy-autonomous islands, resilient to external risks.
Purpose	Promote France's international image, open new markets, revalorize overseas territories as places of innovation, and drive economic development.	Contribute to making these islands self-reliant and autonomous entities, able to make their own choice, with a strong local economy.
Innovation	Testing of energy technologies and learning opportunities for implementation in broader markets.	Local research and innovation ecosystem to face local or regional challenges of renewable integration, innovative energy governance.
Implications	Energy autonomy is a peripheral objective. Reducing dependencies is not central, reasserts belonging to France.	Energy autonomy is crucial to reducing structural dependencies, emphasizes emancipatory ideals from France.
In practice	Promotion of innovative pilot projects, particularly around marine technologies.	Promotion of mature technologies harnessing local resources.

It is tempting to view each vision as completely separate, one nationally produced and the other locally produced, or corresponding to political affiliations. While the 'autonomous islands' project is mostly produced by local actors rather than national media or governments, these visions coexist, overlap, and are not mutually exclusive. This reflects the different scales at which the energy transition is implemented. Diverse positions often emerge from negotiations between actors and the constraints they must operate within, as the energy transition continues to unfold within the framework of the State. Actors may adjust their positioning and narratives according to the audience or context. For example, a member of parliament who had engaged with the laboratory framing when advocating for increased measures for overseas territories in the latest national legislation later criticized its use during our interview. This highlights the strategic nature of the discourse, whereby actors pick and choose elements from the dominant narrative depending on the context. However, the lack of

consistency in individuals' discourse can also be attributed to hesitation and the uncertain nature that surrounds debates over autonomy, which is itself ripe with contradictions.[55]

The two territorial projects proposed through the energy transition discourse further overlap through their reliance on what Kim (2018) calls 'technological developmentalism' or the belief that technologies are conducive to economic growth and social progress. While innovative projects are questioned locally as the transition unfolds, the discourse on the energy transition remains focused on development. The autonomy project itself overlooks the consumption model that sustains energy dependency, and consequently, fails to propose a truly transformative agenda capable of rethinking the foundations of the energy system and the socio-economic structure it supports. Thus, the wind, the sun, or the ocean are envisioned only as resources to be harnessed to support a developmentalist project, with variations in who controls this trajectory and who benefits from it. This denotes the persistence of imaginaries of the plantation, insofar as imaginaries of the energy transition reflect ideas of progress that do not substantially depart from those of the colonizing State. The following section introduces counter-narratives that critically question this dominant paradigm.

5.3. Counter Voices and Critique of Energy Transition Imaginaries

Despite the political implications of different territorial projects embedded in the energy transition discourse, the energy transition has not been a major concern in public debate and has been implemented from the top down, with limited room for public consultation. In Reunion, no opposition groups that publicly protest or take a stance on the energy transition could be identified.

[55] The autonomy debates call for both equality and differentiation, all within the framework of the State (Chapter 4).

In Martinique, however, the civil society organization ASSAUPAMAR offers a counter-narrative to the dominant imaginaries of the transition. ASSAUPAMAR is a civil society organization dedicated to preserving Martinique's natural and cultural heritage. Focused initially on protecting mangroves, it has become the island's most prominent environmental group. The organization regularly participates in land disputes and opposes infrastructural and real estate projects deemed environmentally harmful or against the interests of the 'people of Martinique'. Founded by independentist factions, the ASSAUPAMAR challenges State authority and criticizes colonial land-use and ownership structures. Moreover, it advocates for the defense of a 'Martinican identity,' grounded in the land and nature, and opposed to assimilation into French cultural norms (Ferdinand 2016). For the ASSAUPAMAR, 'Martinicans' are generally understood as descendants of slaves, a category which tends to exclude newcomers and descendants of slave owners as legitimate authorities over the land (Ferdinand 2016).

5.3.1 The ASSAUPAMAR on the Energy Transition

The energy transition is not a central concern for the association. Even so, its members consider the decarbonization of the energy system to be crucial for preserving nature and the lives of future generations. The energy transition, therefore, does not contribute to the creation of a specific territorial project. Instead, the 'energy' topic emerges primarily through protests, social media campaigns, legal actions, or administrative blockages against specific renewable energy projects.

Most notably, the association has actively opposed ground-mounted PV projects and Albioma's biomass plant. The former are opposed mostly based on land use and ownership considerations, while the latter is accused of being harmful to the environment and the population. In both cases, energy projects are framed as profit-making enterprises whose benefits are not redirected to the 'Martinican people' and are not adapted to local realities.

Rather, energy projects are viewed as external interference from the State, benefiting a few illegitimate actors. As such, reasons for opposing projects align with the broader message of the ASSAUPAMAR, which links together ecological and anticolonial struggles. Their position both critiques and aligns with dominant imaginaries of the transition.

5.3.2 The ASSAUPAMAR and Dominant Imaginaries

5.3.2.1. The Laboratory

At the core of ASSAUPAMAR's critique of the energy transition is their opposition to projects that reinforce colonial legacies of State control and unequal benefit distribution. Therefore, members of ASSAUPAMAR launch a strong critique of the laboratory narrative, viewing energy projects promoted as "completely conceived from the outside" as not suited to the island's needs or its population. Regarding the marine energy project NEMO, this member notes the following:

> "… The reality of the country isn't sufficiently taken into account; that's not what interests them. They come with their project: is the project profitable? What will it bring us? Obviously, to push the project through, they'll point out that it's a modern, new technology, etc. It's an experiment, it's brilliantly unique, it will serve as a model for the entire world… It's simply to get the project approved, it's all fake." (IntMA36)

Innovative projects that aim to test technologies or other energy projects not deemed ecologically or socially suitable for Martinique are therefore rejected and perceived as exploiting local resources for external profit. Under such circumstances, Martinicans become the spectators of the energy transition. As one interviewee put it, drawing on a quote from the Martinican thinker Aimé Césaire: *"*It is always someone else's carnival, and we are standing by the side of the road watching it go by." (IntMA36)

5.3.2.2. Autonomy

The autonomist imaginary and the ASSAUPAMAR position on the energy transition share various similarities, insofar as they are grounded in ideals of self-determination and the

necessity for energy projects to create local benefits. Yet, under the autonomist imaginary, the energy transition is seen as a tool of emancipation from the State and dependency relationships, through the regain of material and financial power. In contrast, the ASSAUPAMAR considers the energy transition as a continuation of colonial logics over the control of nature, the land and its people. Unlike the autonomy project, the ASSAUPMAR rejects the developmentalist project and the resource-based understanding of nature.

> "We are opposed to the economic or economistic vision of society. And we're very sensitive to it because, after all, seeing our environment simply as a resource that must bend to the will of economic development… We've seen what that can lead to in the past, when a central authority decides to consume the geography." (IntMA36)

Therefore, the ASSAUPAMAR offers a critique of dominant imaginaries of the energy transition and the ensuing territorial projects. Their critique, however, remains marginalized and has yet to permeate broader discussions around the energy transition in Martinique and beyond. In Reunion, the lack of counter-voices organized around an association like ASSAUPAMAR and active in energy questions leaves dominant imaginaries publicly unchallenged.

5.4. Conclusion

This chapter examined how the energy transition discourse in Martinique and Reunion is constructed, which imaginaries it relies on and what the energy transition is envisioned to achieve. I have established that the energy transition discourse relies on the mobilization of island imaginaries which frame islands as exceptional places for the energy transition. Paradoxically, both positive (abundant) and negative (vulnerable) characteristics associated with islands are used to frame islands as sites where the transition is not only necessary but also extremely suitable and natural. This translates into a vision of islands as prime locations for experimenting with energy technologies. While these findings align with existing research

on islands' energy transition, this chapter also discusses how these are eventually used to argue for different territorial projects.

Two territorial projects, or spatial transformation imaginaries, emerge from the energy transition discourse. The first portrays Martinique and Reunion as laboratories. Thanks to the energy transition, they will contribute to France's international image, serve as testing grounds for technologies, and continue their path towards further development. In contrast, an alternative framing advocates for the energy transition to transform these islands into autonomous, self-reliant islands. The energy transition, and in particular energy autonomy, is perceived as instrumental to curb these islands' inherited material, financial, sectoral and institutional dependencies. By generating endogenous development and ensuring stability in the face of global crises, the energy transition contributes to reducing the vulnerabilities of these islands and increasing their ability to control their access to energy.

These competing territorial visions reflect the longstanding debate over the islands' autonomy and their position within France. Both the laboratory and the autonomous island projects are, nonetheless, bound within a similar developmentalist paradigm, which fails to question the existing logics of the current energy system. As such, the territorial projects put forward by the energy transition discourse continue to embody notions of progress closely aligned with those of the colonizing state. A tendency observed in other works that point to the impossibility of truly forgoing the prism of the colonizing state, the plantation, and Western ideals of progress (Manglou 2024; Holstein 2014). Nonetheless, the discourse of the ASSAUPAMAR in Martinique contrasts with dominant imaginaries of the energy transition by offering a critique of developmentalism and technological enthusiasm. Yet, these counter-voices remain marginal and are bound to Martinique.

The dominant territorial projects emerging from the energy transition discourse address the essential question of what the ultimate aim of the energy transition is in these territories: to

curb the system of dependency or to contribute to France's sustainable development targets and image? While reducing dependency, energy autonomy is a prerequisite; the other objective can easily settle for decarbonization *without* necessarily achieving energy autonomy, and therefore without reducing the electricity system's dependencies.

This chapter contributes to answering some of the dissertation's research questions. It does so by showing how the imaginaries of the energy transition present two different projects, each with distinct implications for the structural dependencies of the electricity system and, more broadly, the relationship between these islands and the State. The energy autonomy project is envisioned to reduce the electricity system's dependencies and, as such, could contribute to reconfiguring the existing territoriality of Martinique and Reunion. This, however, depends on the successful implementation of renewable technologies that harness local resources. Therefore, the next two chapters shift the focus away from the relationship between the State and the islands to examine the internal processes shaping the local implementation of renewable energy, particularly in relation to their land.

Part III: The Islands and their Land

In this third part, the dissertation zooms in on the local dynamics that have influenced each island's energy transition trajectory. The autonomization of Martinique's and Reunion's electricity systems depends on the substitution of fossil imports with local renewable energy. Despite ambitious targets, local renewable energy resources — those that could support energy autonomy — have so far failed to make a substantial contribution to the electricity mix of Martinique and Reunion. For some energy resources, like geothermal and marine technologies, this can be attributed to the lengthy, costly, or experimental nature of these technologies. Wind and solar, however, can be adopted much more quickly and have been available since the start of the transition efforts. Yet, despite official support and ambitious targets for these technologies, wind and solar capacities remain marginal. In 2024, wind and solar together accounted for 11.3% of the Reunionese electricity mix and made up only 7.3% of the Martinican mix (EDF Open Data Martinique 2025; EDF Open Data Réunion 2025).

Across the interviewees, I gathered several explanations for this situation. The first explanation is that national policies supporting renewables have been insufficient. This is especially true for the solar sector. Favorable feed-in tariffs and a distinctive tax regime for solar investments in overseas regions initially provided strong support for PV development. However, this support ended in 2010 when the government significantly reduced feed-in tariffs and eliminated advantageous tax provisions. Additionally, new tariff schemes and calls for tenders specific to ZNIs, crucial mechanisms for PV development, have been systematically delayed compared to mainland provisions. As such, while State policies have influenced solar development on resale prices across France, these policies have been especially inadequate in the ZNIs.

A second explanation lies in the relative land scarcity of these islands, which complicates the uptake of wind and solar energy. Securing space for wind or photovoltaic installations requires energy developers to navigate complex layers of physical and administrative constraints. Martinique and Reunion have rugged topographies, large forest covers, are surrounded by the sea, and have numerous protected areas, limiting renewable development to more accessible and acceptable terrains. In such contexts, when looking for land, energy developers quickly find themselves “either in a national park, a coastal area, or a protected natural area" (Interview with regional energy policy maker, Reunion). Renewable projects often compete directly with other land uses, such as agriculture, flight corridors, tourism, and urbanization, or may pose a threat to biodiversity protection. Administrative regulations mirror this reality and limit renewable energy development in natural areas and along the coast.

Agricultural land, often preferred by energy developers, is further constrained by agricultural protection rules. Agricultural land use is controlled by a local protection commission, which, unlike in mainland France, can validate or veto new infrastructural projects on agricultural and natural lands. The accumulation of physical and administrative constraints contributes to a shared narrative among local energy governance actors and energy developers, which portrays land in Martinique and Reunion as scarce, hence limiting the speed and scale of renewable energy’s uptake.

I propose a third, complementary explanation: the land politics of surrounding the implementation PV and wind shapes the types of infrastructures developed and the pace of their implementation. Wind and solar energy challenge existing land-use and beneficiaries. By this, I mean how land is used and who benefits from it, whether through ownership or from its outputs. Land politics, in this sense, refers to the debates and struggles over these uses and benefits, which ultimately influence the trajectory of renewable energy development.

I come to this conclusion after analyzing how intermittent energy projects are negotiated locally, by whom, and based on what requirements. In Chapter 6, I focus on the case of agrivoltaics, which combines solar infrastructure with agricultural activities, in Reunion Island. Through this *case study within the case study*, I evaluate what kinds of resources are considered legitimate to be produced and extracted from the Reunionese land. I further argue that resource legitimacy is crucial to understanding the success of agrivoltaics deployment at local scales. In turn, Chapter 7 examines the impact of wind and solar development on who has access to, and therefore who benefits from, the land and the electricity sector in Martinique. While each chapter primarily focuses on either land use (Chapter 6 on Reunion) or beneficiaries (Chapter 7 on Martinique), both chapters nonetheless address both issues and demonstrate their impact on renewable energy development.

6. What Should the Land be Used For? Discussing the Legitimacy of Agrivoltaics in Reunion Island

Disclaimer: The content of this chapter was first published under the title "Nothing sweet about agrivoltaics? Discussions on the territorial adequacy of agrivoltaics in Reunion Island" in the peer-reviewed journal 'Sustainability Science' in March 2024 (Plumhans 2025). Parts of the text were summarized to avoid repetition with the analytical framework and methodology sections (Chapters 2 and 3). Finally, minor changes were made that link back to the overall narrative of the dissertation.

During the sugarcane campaign, which lasts from July to November, the roads of Reunion are busy with sugarcane trucks that locals nickname 'cachalots', or sperm whales, hauling cane to the two remaining refineries operated by the multinational company Tereos. These large green trucks display a variety of slogans such as "Our island, our sugar, our innovations", "12,000 jobs that keep Reunion running", or "Sugarcane naturally absorbs CO_2 and purifies our air."

These messages highlight the importance of the sector on the island. The cultivation and processing of sugar cane in Reunion are historically rooted in colonial plantations, slavery, and other forms of racial exploitation. Yet in Reunion, sugarcane is not merely a colonial crop. It is a source of employment, a defining feature of the landscape, and a marker of identity. For

my host Dany, sugarcane fields are the places where she played as a child, a sweet treat she occasionally chews on, and part of a landscape she has always known.

The slogans also serve to remind drivers of the industry's significance at a time of crisis. Younger generations increasingly turn away from sugarcane cultivation, which involves hard work, limited profitability, and heavy dependence on subsidies. Ambitions for greater local food production seem to contradict a sugar cane-centered agriculture, even if many argue that the two can be complementary in pursuing food autonomy. As debates over the future of the agricultural sector intensify, agrivoltaics are sometimes promoted as a possible, yet contentious, alternative to the supremacy of sugar cane. This chapter retraces the challenging implementation of agrivoltaics in this context and highlights the tensions and debates that their development reflects.

6.1. Introduction

Photovoltaic electricity is an instrumental technology for the energy transition. Globally, the solar sector has expanded at an impressive pace and is expected to continue accelerating in the coming years (Irena 2019). Solar infrastructures, although necessary for the transition, can put pressure on food security, agrarian livelihoods, and the environment (Poggi et al. 2018; Müller and Pampus 2023; Sacchelli et al. 2016; Delfanti et al. 2016; Unger and Lakes 2023; Stock and Birkenholtz 2021). In this context, photovoltaics' development faces considerable backlash, particularly when infrastructures are located in agricultural lands (Späth 2018; Nicholls 2020; Bessette et al. 2024; Crawford et al. 2022; Goldberg 2023).

Agrivoltaics, PV structures combining electricity and agricultural production, are an attractive alternative to ground-mounted PV structures and could reduce trade-offs between agriculture and energy (Späth 2018; Agir et al. 2023; Pascaris et al. 2023). Dual land use options are particularly relevant for Reunion Island, which pursues the dual objectives of increasing its energy and food self-sufficiency. In particular, PV is set to significantly contribute to the goal of energy autonomy by doubling the installed capacity by 2022 (Décret relatif à la programmation pluriannuelle de l'énergie de La Réunion, 2022).

Given existing land use pressures, particularly on agricultural land, agrivoltaics offers a solution to reconcile these two objectives. However, recent literature shows that agrivoltaics still face social contestation or opposition from local authorities (Carrausse & Arnauld de Sartre, 2023; Moore et al., 2022). Agrivoltaics are, first and foremost, technological solutions that, in themselves, are not sufficient to solve complex social problems, such as land-use conflicts. Consequently, they have been framed as a 'techno-fix', a technological solution that fails to integrate two distinct systems and their associated norms and institutions: energy and agriculture (Moore et al., 2022).

In Reunion, agrivoltaics can challenge some agricultural sectors through the conversion of land to other crop types. Indeed, most agrivoltaics structures are not suited for crops that require high exposure to sunlight. They are therefore incompatible with the production of sugar cane, the central nerve of Reunionese agriculture inherited from colonial plantations. In response, agrivoltaics in Reunion have developed around shade-friendly crops, such as vanilla or ornamental plants. However, given that sugar cane is a historically significant and heavily protected sector in Reunion, the widespread implementation of agrivoltaics challenges the dependency of the agricultural sector on the sugar cane industry. Therefore, while agrivoltaics offer a potential solution to the food-energy dilemma, they might be ill-suited to the existing agricultural sector.

This chapter analyzes how stakeholders in Reunion debate the implementation of agrivoltaics, specifically in relation to its impact on the agricultural sector. To do so, it traces back the arguments presented by local authorities, professional farming associations, farmers, and energy developers when debating the desirability of agrivoltaics.[56]The interviews grounding this research took place at the end of 2023, as actors were expecting the release of a national decree on agrivoltaics, eventually published in April 2024.

[56] Further explained in the methodology section (Chapter 3).

Using the concepts of territorialization and frontier making (Rasmussen and Lund 2018), I argue that the early development of agrivoltaics until the release of the decree represents a particular 'frontier moment' where the norms surrounding what resources are, and how to control them, are being questioned to make place for territorialization (Rasmussen & Lund, 2018). The formalization of agrivoltaics under the new national decree constitutes a turning point at which stakeholders question and refine what the land should be used for, before the new regulation comes into application.

To do so, they mobilize existing territorial dynamics related to food sovereignty, energy autonomy and the sugar cane industry to discuss the desirability of agrivoltaics. Two key framings are identified from the discussion. The first portrays agrivoltaics as a threat to the existing sectors of Reunion, including sugar cane and vanilla. The second depicts agrivoltaics as a contributor to the energy and food autonomy objectives, simultaneously providing a solution to the problems associated with the sugar cane industry. In essence, those two framings debate the territorial legitimacy of agrivoltaics through the mobilization of local territorial agendas. This exercise implies the discursive undermining of the existing order of land use, or alternatively, the new order proposed by agrivoltaics.

Existing research has highlighted the lack of integration between the agriculture and energy sectors to explain resistance from local authorities to agrivoltaics development (Carrausse & Arnauld de Sartre, 2023; Moore et al., 2022). This chapter advances this argument by showing how local positions towards agrivoltaics are contingent upon the type of agricultural production it induces and its perceived effect on the local agricultural sector. The deployment of agrivoltaics extends beyond the energy versus agriculture debate by also including the type of agriculture promoted, its impact on the existing sector, and the various interests and relations it challenges or reinforces. Therefore, agrivoltaics deployment is intrinsically linked to local land politics and attempts by different actors to reframe what the land should be used

for. Furthermore, this chapter demonstrates that agrivoltaics deployment contributes to reconfiguring some of the dependencies of the agricultural and electricity sectors. The following section provides an overview of the existing literature on agrivoltaics and discusses how such infrastructures can be analyzed through the lens of frontiers and territorialization. I then provide some additional contextual information on the agricultural sector of Reunion and its key actors before presenting the results and findings of this chapter in more detail.

6.2. Agrivoltaics, Frontiers and Territorialization

6.2.1 Photovoltaics on Agricultural Land and Agrivoltaics

Resistance to the integration of renewable energy infrastructures is a well-documented phenomenon across the literature. In particular, several studies focus on the perception of photovoltaics on agricultural land (Moore et al. 2022; Späth 2018; Nicholls 2020; Carrausse and Arnauld de Sartre 2023; Bessette et al. 2024; Brudermann et al. 2013; Agir et al. 2023; Spangler et al. 2024; Goldberg 2023; Torma and Aschemann-Witzel 2023). One reason for opposing the installation of photovoltaics in rural contexts is the concern over the loss of agricultural land (Bessette et al. 2024; Nicholls 2020; Moore et al. 2022; Crawford et al. 2022; Carrausse and Arnauld de Sartre 2023; Nilson and Stedman 2023; 2023; Spangler et al. 2024; Goldberg 2023). Agrivoltaics can prevent the conversion of agricultural land away from farming activities and as such present an alternative to ground-mounted PV, reducing concerns over the loss of farm land and related opposition (Späth 2018; Agir et al. 2023; Taylor et al. 2023; Pascaris et al. 2023).

The term ‘agrivoltaics’ covers a broad range of infrastructure, from the simplest, such as PV arrays placed in between rows of crops, to the most complex like greenhouses, bifacial PV systems, or aquaculture. Agrivoltaics can therefore generate a variety of impacts depending

on their overall structure and conditions (Mamun et al. 2022). Nonetheless, Agrivoltaics are often argued to generate ecological, social, economic and agricultural benefits (Barron-Gafford et al. 2019; Bessette et al. 2024; Crawford et al. 2022; Goldberg 2023; Irie et al. 2019; Li et al. 2017; Lytle et al. 2021).

Such infrastructures could be more easily implemented and generate greater acceptance than traditional ground-mounted PV. Pascaris et al. (2022), find evidence of this tendency in their study of the general public's perception of agrivoltaics in the United States. Yet, when deployed at local scales, agrivoltaics can still face opposition from residents, local administration with permitting mandates or agricultural organizations (Carrausse and Arnauld de Sartre 2023; Li et al. 2017). Therefore, agrivoltaics, as technological infrastructures, are not *in themselves* conducive to consensual implementation.

Despite their potential to mitigate concerns about the loss of agricultural land, agrivoltaics do not automatically address other reasons behind the negative perceptions of PV development. Other grounds, such as aesthetic, environmental, and justice considerations, are often used by local communities and stakeholders to oppose PV siting on agricultural land (Nilson and Stedman 2023; Bessette et al. 2024; Crawford et al. 2022). In addition, Nicholls (2020) and Moore et al. (2022) show that the adoption of PV systems on agricultural land challenges people's normative beliefs about the nature of farmland and rural landscapes (Nicholls 2020; Moore et al. 2022). Consequently, PV infrastructures, including agrivoltaics, can be seen as either *alternatives to* or *threats against* these norms, as they confront assumptions about the use of agricultural land, a complexity not easily resolved by agrivoltaics. Agrivoltaics are then a 'techno-fix', a one-sided technological solution to intricate societal problems, which fail to engage with the reality of the agricultural sector and the challenge of confronting the two 'complex systems' (Moore et al., 2022) or 'regimes' (Carrausse and Arnauld de Sartre 2023) of energy and agriculture.

Agrivoltaics, initially developed in energy-technological regimes (Carrausse and Arnauld de Sartre 2023), need to gain credibility within the agricultural institutional order. In this context, authors have highlighted the diverse legitimization strategies used by promoters to demonstrate the advantages of such infrastructure to farming activities or other ecological services (Carrausse & Arnauld de Sartre, 2023; Seay-Fleming et.al, 2025; Hu, 2023). When agrivoltaics fail to adapt or convince local stakeholders, this can lead to administrative blockages and opposition. In their analysis of agrivoltaics deployment in France, Carrausse and Arnauld de Sartre (2023) find that opposition to agrivoltaics resulted from a perceived 'forced territorialization' of agricultural land, where new infrastructures are integrated into agricultural land without prior local appropriation of the technology.

Building on these contributions, I investigate how specific territorial contexts shape local discourse and positions on agrivoltaics deployment. Indeed, agricultural and energy policies are crucial elements of a place's territorial strategies for land use. Norms associated with rural areas and agricultural land are not universal, and their uses are often embedded in strategic territorial decisions. Agrivoltaics, by restricting cultivation to certain crop types, challenges existing agricultural planning and practices (Goldberg 2023). The degree of successful or consensual implementation of agrivoltaics therefore goes beyond the energy vs agriculture dichotomy. It encompasses the *kind* of agriculture promoted and its impact on existing sectors and associated interplay of interests. To analyze the dynamics at play, this chapter takes up and expands from the conception of agrivoltaics-as-territorialization (Carrausse and Arnauld de Sartre 2023) and considers its relations with frontier dynamics.

6.2.2 Agrivoltaics Through the Lens of Frontiers and Territorialization

This chapter uses the conceptual tools of frontiers and territorialization (Chapter 2). Applied to the case study at hand, territorialization concerns the new rules (e.g., legislative change) and orders (e.g., land-use classifications) that facilitate the simultaneous production of agricultural products and electricity from agricultural land. In other words, it relates to the acts of 'proscribing or prescribing' solar energy production within agricultural land, by granting or preventing access to the land and its resources. In contrast, frontiers imply the erosion of legal structures, institutional stances, and expectations about the use of agricultural land brought about by agrivoltaics. Frontiers are necessary for territorialization: for the new order to be instituted, the old one must first be erased.

In the past decade, resource frontiers scholars have studied the emergence of new frontiers that occur in places where the commodification of natural resources is itself not novel (Peluso and Lund 2011; Tsing 2003). Those new frontiers are rarely

> "sites where 'development' and 'progress' meet 'wilderness' or 'traditional' lands and people. They are sites where authorities, sovereignties, and hegemonies of the recent past have been or are currently being challenged by new enclosures, territorializations, and property regimes."(Peluso and Lund 2011, 668).

New frontiers dynamics can also occur in 'green' projects such as conservation areas (Bassett & Gautier, 2014; Woods, 2021), or renewable energy production (Backhouse and Lehmann 2020; Singh 2022). Similarly, PV and agrivoltaics deployment can be seen as newly 'discovered' or 're-invented' resources that can be harnessed from spaces previously territorialized by agricultural production. Agrivoltaics presents a particular case as they do not directly presume the complete eradication of one system for the other, but rather a superposition of different systems: electricity production and agriculture. Nonetheless, the type of agricultural production that accompanies agrivoltaics can compete with existing

agricultural territorial arrangements and introduce new actors competing for access to the land.

In this chapter, I focus on a particular 'frontier moment' when the rules affecting the territoriality of resource use about agricultural land use in Reunion are shifting or halted, affecting the very idea of what resources are or should be (Rasmussen and Lund 2018). This corresponds to the early development of agrivoltaics in Reunion up to the change in the French legislative framework, where the introduction of agrivoltaics is redefining agricultural land use. At this moment, local actors, old and new alike, discuss, promote or oppose upcoming territorial change.

For Lund & Rachman (2018), frontier dynamics rely on “a process that obscures and dismisses previous resource use and disenfranchises those who hitherto have benefited from resource access” (419). New actors need to rely on discursive and representational strategies to assert the legitimacy of their endeavors, often in opposition to the status quo (Lund and Rachman 2018; Rasmussen and Lund 2018). As part of this process, old “institutional orders are sometimes undermined or erased, and sometimes reinterpreted, reinvented, and recycled” (Rasmussen & Lund, 2018, 388). Existing symbols and norms can be used as arguments to valorize new resources or equally oppose them. Previous literature has also highlighted how global challenges such as climate change, energy transitions and conservation are useful legitimators for extractive projects (Bassett and Gautier 2014; Woods 2019). Similarly, local issues and deficiencies can also be mobilized to argue for the benefits of the new extraction model for the local economy (Backhouse and Lehmann 2020).

The study of the agrivoltaics deployment presented in this chapter follows the arguments used to discuss the ‘legitimate’ use of agricultural land and the resources it should produce. In the context of this paper, legitimacy is understood as a process, constantly in negotiation through

acts of legitimization, based on (re)-framing of certain practices as acceptable and desirable (Sikor and Lund 2009).

6.3. Agriculture and Photovoltaics in Reunion

6.3.1 An Agricultural Sector Under Pressure

Reunion Island, despite the availability of local fruits and vegetables, has historically been vulnerable to food dependency (Holstein et al. 2024). The reduction of the overall food dependency along the entire value chain is the focus of debates and plans to achieve greater food sovereignty (Agreste 2017). The necessity for food sovereignty and greater local production levels is further exacerbated by the relatively small and decreasing size of the Used Agricultural Area (UAA), which has suffered a loss of 10% during the 2010-2020 period, particularly impacting fields dedicated to sugar cane cultivation (Agreste 2021). The loss of the UAA is associated with urbanization and the abandonment of agricultural activities (Agreste, 2021). As such, the protection of agricultural land is a crucial policy objective along with food sovereignty and self-sufficiency efforts, despite the lack of a precise target or definition of food sovereignty.

Those objectives run in parallel with the continuous support given to the sugar cane sector, whose activities account for more than half of the total UAA (Agreste, 2021). The importance of the industry and the necessity to preserve it are also present in the local plan for food sovereignty (DAAF Reunion 2023). Often referred to as the ‘sugar-rum-energy’ sector, sugar cane cultivation is connected to more than just the sugar industry. This includes the production of electricity from bagasse and the spreading of manure from other agricultural activities on sugar cane land. Farmers who grow sugar cane also often need to participate in other agricultural activities to supplement and diversify their revenue streams.

The ‘sugar-rum-energy' sector is made up of a range of actors with overlapping but sometimes conflicting interests. The industry predominance is linked to Reunion's colonial plantations, which can be considered as a first wave of commodification induced by the ‘sugar frontier’ (Holstein et al. 2024; Moore 2000). Despite having evolved away from traditional colonial ownership structures, the sugar sector retains considerable power over the island’s economic and agricultural policies (Candau and Gassiat 2019; Martignac 2004; Joltreau 2023). Agricultural land is no longer organized around a colonial plantation structure since the land reform of 1961. This reform dismantled colonial land-ownership structures and granted property rights to small farmers, de-linking agricultural land ownership from colonial plantations. Yet, actors can have access to resources without ownership and property rights over the land (Sikor and Lund 2009). Therefore, access to the land and its resources did not end with property shifts, as previous plantation owners retained their activity as sugar industrials and as such both an interest and power in the production of sugar cane taking place in the lands they no longer owned (Candau and Gassiat 2019; Martignac 2004; Joltreau 2023).

Today, the power of the sugar industry is concentrated, with only two sugar refineries owned by the French multinational TEREOS. Sugar cane cultivators and their representatives are at the same time partners and adversaries with the sugar industry; each depends on the other for the continuation of its activities but faces each other in negotiations over prices and trade conditions. In addition, the multinational energy company Albioma, which compensates farmers for the bagasse that can be converted to energy, also depends on a continuous supply of sugar cane byproducts.

This interplay of actors and the current agricultural policies has several ramifications for the energy sector and the development of agrivoltaics. First, the pressure on agricultural land further problematizes the integration of photovoltaic infrastructures if they are perceived as taking away already scarce land, necessary either for food sovereignty or for the maintenance

of the sugar cane sector. This risk is identified in the local plan for food sovereignty, which anticipates the decree on agrivoltaics and postulates for PV to be developed on roofs (DAAF Reunion 2023). The difficulty in reaching both energy and food self-sufficiency is confirmed by Russeil et al. (2023), who point to the near impossibility of achieving both objectives without large-scale land planning policies partially relying on the conversion of some sugar cane land and PV uptake. Such reductions of the sugar cane area is further recommended by Billen et al. (2024). Second, a loss of sugar cane production would impact the current energy mix as bagasse directly contributes to the decarbonization and the autonomy of the electricity sector (Russeil et al. 2023). Finally, photovoltaics and agrivoltaics introduce a set of new players who also need to be granted access to the land to exploit its resources, potentially challenging the existing institutional order of the sugar-rum-energy complex for land access and its complex set of interests.

6.3.2 Actors and Regulators of Agrivoltaics in Reunion

Agrivoltaics are first and foremost regulated by the State through national regulations governing the deployment of renewable energy, including the decree on agrivoltaics. Moreover, agrivoltaics projects depend either on auction calls or on feed-in tariffs from the National Regulatory Commission on Energy (CRE). At the local level, the deployment of agrivoltaics in Reunion brings together a complex mix of supranational, state, regional, departmental and local actors, all interacting and contributing to the discussion around PV on agricultural land. These include local representatives of the state, civil society organizations, regional policymakers, farmers' professional organizations, farmers working with agrivoltaics, and energy developers.

While some actors are more easily identified as supporting the sugar cane industry (e.g. the state agricultural agency) and others less (e.g. solar energy providers), most actors are not so

easily categorized. For example, some farmers with agrivoltaics, also cultivate sugar cane in other plots. This means that while some may want to diversify or even abandon sugar cane cultivation, if they continue their activity, their interest also lies in the health of the industry. A similar situation applies to farmers' professional organizations, which both represent farmers cultivating sugar cane and accompany them in a potential transition. This means that interests are not always clear-cut and may fluctuate for each participant depending on which level (individual, professional, or collective) they position themselves.

The Departmental Commission for the Preservation of Natural, Agricultural and Forest Areas (CDPENAF) holds considerable power over the regulation of energy structures on agricultural land. This commission represents various interests and is composed of state and regional-level agencies and professional organizations in the agricultural and environmental sectors. The CDPENAF's role is to protect natural and agricultural land and can either prevent or accept new infrastructure on agricultural land, including photovoltaics.

The CDPENAF's power over agrivoltaics projects was enabled by the lack of a regulatory framework for agrivoltaics. A situation that could considerably change with the new decree on agrivoltaics. The decree, published in April 2024, follows the law on the acceleration of renewable energy of March 2023, which defines agrivoltaism as

> "electricity production facility that uses the sun's radiative energy and whose modules are located on an agricultural plot where they make a lasting contribution to the establishment, maintenance or development of agricultural production." (Loi Relative à l'accélération de la production d'énergies renouvelables, 2023)

This national decree further stipulates the detailed conditions for the deployment of agrivoltaics, such as the limit of agricultural land covered by agrivoltaics (40%) and the type of services it should provide to the farming activities (Décret relatif au développement de l'agrivoltaïsme et aux conditions d'implantation des Installations photovoltaïques sur des terrains agricoles, naturels ou forestiers, 2024). Despite posing limits to its implementation,

through the decree, the State set an enabling framework for the integration of agrivoltaics on agricultural land, regardless of local experiences or perceptions. The chapter examines how local actors in the energy and agricultural sectors negotiate the implementation of agrivoltaics, anticipating the release of the new decree.

The findings are divided into two sections. The first section describes the early development of agrivoltaics and local stakeholders' perceptions in light of the interviews. The elements presented there are necessary to understand the context of distrust in which the current discussion around agrivoltaics takes place, hence requiring a re-valorization of agrivoltaics. The second section, based on the thematic analysis, outlines the key elements used by actors to de- or re-legitimize agrivoltaics and how they fit within two main framings of the agrivoltaics debate.

6.4. Results

6.4.1 Early Development of Agrivoltaics

Agrivoltaics were first developed in the early 2010s by the energy company AKUO as a direct response to the unease of the agricultural sector towards ground-mounted photovoltaics. Showcased during multiple ministerial visits from the French government and featured in the French environmental documentary *Tomorrow*, those first projects served as figureheads for agrivoltaics.

Picture 6 Agrivoltaics Farms from the Early 2010s, Taken by Author (2023), PV installations property of ©Akuo

The agrivoltaics installations in Reunion today display a range of infrastructural structures, from basic, such as PV arrays placed between rows of crops, to the more sophisticated like greenhouses for cultivating various crops, including fruits and vegetables, ornamental plants, and vanilla.

Picture 7 Agrivoltaics Farms Specialized in Ornamental Plants and Vanilla, Pictures Taken by Author (2023).

Yet, despite the early good press, agrivoltaics, and photovoltaics in general, have failed to be more widely implemented, which can partly be explained by the local perception and resistance within administrative bodies to such projects. A tendency confirmed during the interviews.

In general, stakeholders' positions towards agrivoltaics can be understood as a continuum, with few actors situated at two extremities: strongly against (n4) or strongly for agrivoltaics (n6), and most positioned in between. Strong proponents include energy companies (n3) and local energy governing bodies (n3), while institutions that show the most reticence to agrivoltaics are made of institutions from the agriculture and environmental sectors (n3), except for one local energy company (n1). Finally, while most extreme positions mostly follow the agriculture/environment versus energy division, more nuanced positions are held across sectors.

The other 20 interviewees show more nuanced positions about agrivoltaics. Those will not outrightly dismiss agrivoltaics but may argue against a specific type of agrivoltaics model depending on the extent to which they generate agricultural production, or on the crop type that can be grown underneath. Therefore, no clear sectoral patterns can be discerned from the analysis. Rather, there is a diversity of positionings indicating the debated nature of agrivoltaics, with a majority of actors expressing concerns, caution or necessary conditions for its implementation. For example, farmers interviewed who had or were in the process of acquiring agrivoltaics both show caution towards large-scale and inadequate development but still see a role for agrivoltaics in Reunion. This careful stance is largely influenced by the first projects implemented in the early 2010s. For many interviewees, most projects have failed to keep their promises. This civil servant working on energy governance recognizes the value of agrivoltaics for the energy transition but considers that the first projects were not adequate:

> "Not all of them but many, have been alibis. Basically, in the beginning, they said, we're going to grow crops, we're going to farm under the panels… in the end, there's nothing growing. It turns out that the initial design didn't allow for any farming to be carried out underneath." (IntRUN16, civil servant, regional energy governance)

This assessment of early projects is largely shared among the interviewed stakeholders, including farmers with or interested in agrivoltaics, energy and agricultural policymakers, agricultural professional groups and energy producers. While stakeholders involved in projects contest the presumed failure of the agricultural activities, they tend to recognize the 'experimental' nature of those first projects, which have led to several 'learning points'. As he was showing me the passion fruits that now grow under the agrivoltaics infrastructure, this early adopter described the steep learning curve he faced to achieve a satisfactory level of production, a skill he had to develop independently as the energy developer did not assist him:

> "I regret that I had to self-train. The plant doesn't react the same indoors as it does outdoors, whether in a normal greenhouse or not. So it's about finding the right way to do it... I was alone, there was no one." (IntRUN25, farmer with agrivoltaics)

This early complicated start is connected to the lack of regulation around agrivoltaics and the first attempts to go through permitting by proposing agricultural production as a form of compensation mechanism for using agricultural land. The fieldwork revealed that some of those early projects were not initially designed as agricultural projects but had to be developed that way to secure permits. In essence, those projects fit the description of techno-fixes, whereby an energy technology is rolled out onto agricultural land to fence off land use concerns, without much consideration for how agriculture will be fostered. This leads to a level of agricultural yields that many local stakeholders deem suboptimal. The success of agrivoltaics deployment in Reunion induced by the new decree therefore requires agrivoltaics to be re-legitimized as viable and necessary for the agricultural sector and the island's energy transition. The following section outlines how agrivoltaics deployment is discussed at this particular 'frontier moment' given the current atmosphere of distrust.

6.4.2 Negotiating Agrivoltaics at the 'Frontier Moment'

As actors discuss the desirability of agrivoltaics for their territory, they engage in a discourse that either frames agrivoltaics and the resources it enables to produce as territorially adequate, or, in contrast, unfit for the territorial context— a discourse considerably tainted by the negative perceptions of the first projects. To do so, actors mobilize key territorial realities, strategies and existing tensions concerning the agricultural and energy sectors. Working in a mirroring fashion, each element or theme presented against agrivoltaics is then reused to argue for its suitability. In this section, I present the thematic clusters of arguments used to discuss agrivoltaics, one pertaining to the agricultural sector, and the other concerning energy planning. In each cluster, several dimensions further frame the discussion. The table below summarizes those arguments.

Table 9 Thematic Clusters

Themes	Description
Agriculture	
Food sovereignty	Under this theme, actors discuss the potential of agrivoltaics to contribute or not to the food sovereignty objective of the island.
Impact on the agricultural sector	Agrivoltaics are discussed along with their negative or positive impact on the agricultural sector as it faces the current issues of sugar cane decline and UAA reduction (at the farm or regional level).
Energy	
PV target	This dimension addresses whether it is necessary to mobilize agricultural land to achieve PV targets outlined by the energy and spatial planning documents.
Energy autonomy and local energy production	Agrivoltaics are discussed based on their contribution to energy autonomy, particularly in relation to the production of electricity from biomass.

6.4.2.1. Agrivoltaics and Agriculture

The line of argumentation under this category draws from the wider agricultural context of Reunion. This includes references to food sovereignty and the role of agrivoltaics in the context of existing pressures on the UAA and the sugar cane sector.

Food Sovereignty

The island food sovereignty's objective is a key element used to discuss the suitability of agrivoltaics. Food sovereignty's lack of clear definition in Reunion's planning document means that actors often have their own understanding of the term. Therefore, food sovereignty is here treated as a floating concept, which is known to actors as an overarching goal but which they use in their argumentations depending on their interpretation of the concept. This is particularly apparent when actors discuss the case of the 'vanilla model'.

As previously discussed, agrivoltaics in Reunion are often negatively assessed based on their lack of agricultural productivity, inferred from their evaluation of the first few projects. However, even the fiercest opponents of agrivoltaics recognize that there exist two exceptions to this agricultural productivity problem: vanilla and ornamental, fragrant or medicinal plants. Indeed, it is generally recognized that agrivoltaics infrastructures built around such crops

allow for a satisfactory level of plant growth, due to the shaded environment that they require to thrive. Yet, actors disagree on the suitability of the model considering its inability to contribute to the food sovereignty objective. In contrast, for energy developers, vanilla-PV models:

> "contribute to the objective of food self-sufficiency. We know that we need to be able to feed people on the island, so if we are a little bit smart, if we grow something that is consumed by the population and that can limit imports and if it comes out at a perfectly reasonable price, well, it would be a shame to deprive ourselves of that." (IntRUN13, energy producer)

A similar argument is used by this vanilla producer, one of the precursors of the agrivoltaics-vanilla model, often mentioned a successful case among more nuanced interviewees. When asked about the impact of this model on the food sovereignty of the island, he proceeded in the following way, stretching the concept of food sovereignty:

> "Let me explain something to you about food self-sufficiency: to eat, you need money; to have money, you need to plant something other than sugar cane. If we plant around thirty or forty hectares of vanilla, then people produce, they have wealth." (IntRUN5, Farmer with agrivoltaics)

Food sovereignty is further used to highlight the inadequacy of such discourse in a context where a large amount of the UAA is dedicated to sugar cane:

> "When you talk to some people, you get the impression that they immediately put photovoltaics in competition with food, and when you tell them yes, but what about sugar cane? It's not a food crop. Sugar cane is not at all necessary for food. The answer is immediately that sugar cane is protected,'we can't touch it'. The result is that energy and food have to share a tiny piece of the cake." (IntRUN2, representative, supporting institution energy transition)

This argument goes hand in hand with the idea that, in contrast to the sugar cane industry, agrivoltaics can contribute to food sovereignty, whether or not it is based around vanilla production. Agrivoltaics accompany:

> "a transition away from the sugar cane industry towards food-producing agriculture, to see how food-producing agriculture can accommodate or complement photovoltaic energy." (IntRUN20, civil servant, regional energy policy)

Impact on the Agricultural Sector

As the two previous quotes emphasize, by arguing for the suitability of agrivoltaics, actors also question the suitability of the sugar cane model. This takes place in a climate where the diminishing UAA, particularly affecting sugar cane cultivation, is a key concern for the agricultural sector. Agrivoltaics are perceived as a potential threat to issues encountered by the agricultural sector, as illustrated here by a civil servant at the agricultural chamber:

> "It's really about protecting agricultural land because we're in a constrained area. In the space of 10 years, we've lost 4,000 hectares, including 3,000 of sugar cane land, which means that despite everything, this is really about the loss of agricultural land and associated land-use conflicts […]. So tomorrow, if we have a lot of land that's going to be artificialized for photovoltaics, for agrivoltaics, it is a real issue." (IntRUN30, Employee, farmers' representation)

In line with this position, energy providers, energy agencies at the departmental and regional level and farming cooperatives generally argue that agrivoltaics could help the issues faced by the agricultural sector through its contribution at the farm level by providing a range of services to the farmer. Those would have a globally positive effect on the agricultural sector, while also producing electricity, a "win-win".

Monetary benefits, in the form of rents or through the production of high-value-added crops (such as vanilla), are argued to generate a stable income stream. Agrivoltaics also directly benefit agricultural activities. The shade generated by the PV panels is here perceived as a good thing: it reduces sun exposure in areas of the island where the sun is too intense for certain crops, and in the case of livestock, enhances animal well-being. A variety of other arguments are found in the interviews from water retention benefits to the protection of crops during cyclonic events.

Those benefits, it is argued, amount to a regain of attractiveness for farming, making it more sustainable, and even contribute to 'take back' fallow lands and keeping agricultural land in use, opposing the trend of diminishing UAA. By offering a means of diversification,

agrivoltaics are presented by energy developers involved in agrivoltaics, as well as farmers, as an alternative to the sugar industry's deficiencies. As one energy developer explains, "a farmer who currently has 50 hectares of sugar cane", has to think of his succession and how he can diversify its production to offer his children "a basket of income that doesn't solely depend on sugar cane…" The production of 'high-value-added' crops such as vanilla can effectively contribute to this stability, and even maybe supplant sugar cane production. A similar argument was shared with me as I interviewed an employee from a company involved in agrivoltaics projects that combined vanilla production;

> "Young farmers these days want to grow less and less sugar cane. With vanilla, we're able to offer them a small plot of land on which to develop something that can be profitable for them, yes, and it's less tedious than with sugar cane. And also, we'll have to diversify, sugar cane in 20 years' time, it's all over. There are other countries next door that produce for 20 times cheaper." (IntRUN7, energy developer)

As exemplified above, one way to justify agrivoltaics is to frame the production it generates as 'high-value', capable of contributing to the stability of the agricultural sector and of its farmers, as opposed to the sugar cane industry. Vanilla is particularly present in the discussion partly because of its symbolic and patrimonial character. Reunion is known as the birthplace of the vanilla pollination process, discovered in 1841 by Edmond Albius, working as a slave in vanilla plantations in Sainte-Suzanne. This 'origin story' and historicity is used both to argue for and against agrivoltaics.

For critics, agrivoltaics amount to the industrialization of a niche artisan market. For some actors in the agricultural sector, cultivating vanilla under PV panels, as opposed to its traditional underbrush cultivation, implies large-scale production, which could "severely disrupt the vanilla market", which is an 'artisanal' market, producing world-renowned vanilla (*civil servant, agricultural policy*). Similarly, proponents argue that it contributes to the continued production of a historic and high-added-value crop. Vanilla is the crop *par excellence* for Reunion, whose 'premium quality' contributes to the 'island's visibility',

fostered by the agrivoltaics-vanilla model.[57] For example, the story of Edmond Albius was used in the interview with representatives of the municipality of Sainte-Suzanne, who framed agrivoltaics as a way to bring back more vanilla production to its historic birthplace.

Therefore, the argumentation around agrivoltaics is closely intertwined with the local dynamics of the agricultural sector, particularly in relation to the sugar cane sector and works to redefine the legitimacy of key crops such as vanilla and sugar in the Reunionese agricultural landscape as it faces structural issues.

6.4.2.2. Agrivoltaics and Energy

Reaching PV Targets: Agricultural Land vs Rooftops

Energy providers often cite key local planning documents to justify the mobilization of agricultural land for PV production. Referring to the ambitious targets for PV intake, they make the argument that without agrivoltaics, or even ground-mounted PV on agricultural land, that target becomes unreachable:

> "We'll be obliged to use agrivoltaics if we're even going to meet the objectives of the multi-annual energy program. We won't be doing just agrivoltaics, but if it doesn't contribute, the target will never be reached." (IntRUN7, energy provider)

This notion is opposed by actors who position themselves most strongly against agrivoltaics, and suggest that roofs and already artificialized land are sufficient to reach energy autonomy. This argument, as is often the case in this mirroring exercise, is countered by energy providers who argue that rooftops are not sufficient or too hard to equip. Therefore, there is a lack of consensus on whether there is a necessity to develop PV on agricultural land, with each party referring to their own sources to assert the veracity of their claims.

[57] Vanilla production in Reunion is subject to competition from the Madagascar market

Energy Autonomy: Local Character of Energy Production

One of the strategies used to legitimize the development of agrivoltaics in Reunion rests on the argument that photovoltaics directly contribute to the energy autonomy of the island, as opposed to the biomass solution which despite its use of bagasse, still relies on imports. Proponents emphasize the local character of PV by opposing it to the biomass solution, which falls short of achieving energy autonomy and could endanger Reunion's energy security. A representative of a local agricultural cooperative emphasizes this by outlining the risks involved. Importing "thousands of tons of wood pellets from Quebec" enhances Reunion's dependency on the outside world, eventually endangering the ability of the Reunionese society to function. And to add in conclusion "Once we have said that, and I believe that, we need to develop solar energy." Therefore, PV is considered to be better than biomass due to its local character. Yet, this 'local energy resource' narrative is contested on the grounds that PVs are not truly local, due to the associated value chain of the PV industry:

> "Even to produce photovoltaic energy locally, you have to be dependent on third parties, often connected to complicated geopolitical schemes." (IntRUN22, Civil society volunteer, environment and protection of agricultural land)

The need to mobilize agricultural land for the generation of local energy resources is therefore heavily contested, with parties using the prism of energy autonomy to argue for different sides.

6.4.3 Framing the Agrivoltaics' Debate

Each of the themes derived from the thematic analysis (food sovereignty, impact on the agricultural sector, PV targets, and energy autonomy) describes in detail how different elements of the local territorial strategies are mobilized to debate agrivoltaics deployment on the island. Actors use those elements according to two main framings: one that generally depicts agrivoltaics as territorially illegitimate, and another that claims the contrary. The table below summarizes the framings in relation to the different themes identified in this chapter.

Table 10 Framings of Agrivoltaics Along Key Themes

Themes	**Framing**	
	Territorially illegitimate (opposition)	**Territorial added value (support)**
Agriculture		
Food sovereignty	Agrivoltaics are not suited for agricultural production and take away productive land necessary for food sovereignty.	Agrivoltaics contribute to food sovereignty, as opposed to the sugar cane sector.
Impact on the agricultural sector	Agrivoltaics are a threat to the agricultural sector (low yields and inadequate production).	Agrivoltaics can contribute to a healthier agricultural sector and counter structural deficiencies associated with the sugar cane sector.
Energy		
PV target	It is not necessary to develop PV on agricultural land to meet PV targets.	It is absolutely necessary to develop PV on agricultural land to meet PV targets.
Energy autonomy and local energy production	PV is not a truly local resource when considering the entire value chain.	PV contributes to energy autonomy targets, unlike biomass.

6.4.3.1. Agrivoltaics are Territorially Illegitimate: Challenging Existing Industries and Agricultural Dynamics

In this discursive framing, agrivoltaics are seen as inherently problematic and in direct contradiction with the health of the agricultural sector. Agrivoltaics are not only conducive to an unsatisfactory level of production but also to the *wrong kind* of production: i.e. not alimentary or too industrial. Agrivoltaics further exacerbate the structural issues found in the agricultural sector, in particular of the sugar cane industry, and are counterproductive to food sovereignty objectives.

This narrative essentially delegitimizes agrivoltaics based on its inability to contribute to food sovereignty or the stability of existing sectors. Similarly, the objective of energy autonomy is mobilized to argue against PV, undermining its ability to serve as a local source of energy. In essence, it advocates the use of agricultural land for certain kinds of resources, in continuity

with local plans for food sovereignty and without challenging the existing order based on the sugar cane industry.

6.4.3.2. Agrivoltaics bring Territorial Added Value: Addressing the Challenges of an Inadequate System

Within this framework, agrivoltaics are portrayed as inherently adapted to the territorial context. Agrivoltaics are a means to alleviate some of the structural issues faced by the agricultural sector and contribute to both food and energy autonomy. Their introduction not only contributes to local food production but also provides alternatives to counter agricultural decline, in particular with regard to the sugar cane sector. By reusing some ambient discourse around energy autonomy, food sovereignty and pressures on agricultural land, this discourse places agrivoltaics as a legitimate means to participate in a more autonomous island. The reinterpretation of the meaning of food sovereignty is particularly evident in the way that a crop like vanilla can be twisted into a commodity that contributes to food sovereignty, despite its lack of caloric value.

Beyond the mobilization and reinterpretation of existing narratives, this discourse works to question the sugar-cane-centered industry. Agrivoltaics are advocated as a means of agricultural diversification or even as an alternative to sugar cane cultivation, deemed inadequate. Agrivoltaics, linked to the production of high-value-added crops, is argued to provide income stability to farmers, which eventually prevents the loss of agricultural land. In addition, agrivoltaics are claimed to provide local energy resources, unlike biomass which requires a subset of importation. Therefore, the discourse in support of agrivoltaics reinterprets and undermines the existing order, making place for the entry of agrivoltaics as a legitimate means of resource production.

6.5. Discussion

The results section shows how local territorial plans and issues shape the discourse around agrivoltaics in Reunion. Two key framings were identified: one that opposes agrivoltaics on the grounds of its territorial illegitimacy, its inability to be integrated with the local agricultural context, or the necessity to reach energy autonomy objectives. In contrast, the discourse supporting agrivoltaics deployment frames agrivoltaics as a solution to meet energy autonomy and food sovereignty objectives, and at times highlights its superiority to a sugar cane-centered use of agricultural land. As such, both framings rely on the undermining of either the new or the old order of land use.

The discussion in Reunion is illustrative of the frontier-territorialization dynamics at play in the deployment of agrivoltaics. They initiate a process of transformation, challenging existing land uses and the order of resource extraction. In France, the formalization of agrivoltaics through the decree efficiently participates in the territorialization of agricultural land to include the production of electricity through photovoltaics. At the local level, this necessitates the re-negotiation of what resources can be extracted from the land. This process rests on the *undermining, reinterpreting or recycling* of existing orders (Rasmussen & Lund, 2018) based on existing norms and local concerns such as food sovereignty, autonomy and the preservation of agricultural land and activities.

In the context of Reunion's efforts to achieve energy autonomy, the findings demonstrate that renewable energy infrastructures challenge existing land uses and the interests of those who already have access to the land. Moreover, their implementation contributes to reconfiguring the existing dependencies of the agricultural and electricity sectors. Agrivoltaics actively question the dominance of the sugar industry and, as such, challenge the sectoral dependency of the agricultural sector. Furthermore, the deployment of agrivoltaics takes place in a context marked by food dependency, partly induced by the monopolization of agricultural land for

export-oriented crops. This means that when agrivoltaics fail to produce sufficient agricultural commodities for local consumption, they contribute to widening food dependency rates. Finally, the implementation of agrivoltaics reveals a partial reworking of the electricity sector's institutional dependencies. Local authorities have exercised some leverage on the electricity sector by blocking permits for agrivoltaics projects, showing relative agency despite the national framework.

Beyond the case of Reunion, this chapter has three main implications for how we approach agrivoltaics deployment. First, it confirms previous findings on the intricacies of integrating energy and agricultural objectives into agricultural land, as they bring together two systems of value production. In particular, the case of agrivoltaics' implementation in Reunion reinforces the argument of Moore et al.(2022) that agrivoltaics can become a 'techno-fix' when they artificially bring energy and agriculture together without substantial consideration of the norms it may re-shuffle around the use of agricultural land. In Reunion, the early deployment of agrivoltaics failed to consider these aspects, leading to some form of backlash to this day. This analysis particularly adds to existing research by showing the importance of the type of agricultural production agrivoltaics induce, and the challenge they pose to existing agricultural practices. This means that agrivoltaics adoption should be studied beyond the energy versus agriculture debate to consider the type of energy and agriculture they induce and their relation to existing strategies and interests.

Second, the analysis of the Reunionese case of agrivoltaics further contributes to the literature on local opposition and contestations of PV deployment in rural areas, which has primarily focused on opposition from local communities as new projects have already been permitted by local authorities. The analytical focus and findings presented here further highlight the role of local administrations in opposing discursively, and at times administratively, the integration of PV structures within agricultural land. Such findings are in line with those of Carrausse &

Arnauld de Sartre (2023) who highlight the divergence of position between local and national authorities as their visions of territorial organization differ.

Finally, the case further contributes to understanding the workings of 'new' resource frontiers, which emerge in places where an existing order of resource extraction exists but is challenged by new necessities brought upon the necessary energy transition. In contrast to similar work on renewable frontiers, agrivoltaics deployment in Reunion does not rely on violence and dispossession, and no clear 'normative' conclusions can be drawn from the analysis. Qualifying agrivoltaics deployment as a territorialization-frontier process does not necessarily imply that the existing organization is more desirable than the new one. Rather, it shows the processes through which actors promote or oppose change in land use.

6.6. Conclusion

To contribute to its energy autonomy objective, Reunion must deploy local renewable energy capacities such as photovoltaics. Photovoltaics creates pressure on agricultural land, which the introduction of agrivoltaics could mitigate. Through such infrastructures, energy and food autonomy could be complementary rather than contradictory objectives. Yet the implementation of such infrastructures depends on their acceptance by local authorities and stakeholders, both in the energy and agriculture sectors. Agrivoltaics in Reunion has a relatively long history and a somewhat poor reputation. Given the new regulatory framework around agrivoltaics, this chapter has explored local debates over the implementation of agrivoltaics.

The analysis has revealed that proponents and opponents of agrivoltaics rely on similar discursive techniques to frame their argumentation. The discourse opposing agrivoltaics argues that PV development exacerbates structural issues within the agricultural sector and hinders food sovereignty goals. In contrast, proponents frame agrivoltaics as a solution to

address challenges of the agricultural sector, in particular facing the sugar cane industry, while promoting energy and food sovereignty. Eventually, the desirability of agrivoltaics is discussed based on its territorial legitimacy; whether or not what it produces is a legitimate, acceptable use of the land in light of local concerns, challenges and interests.

The findings indicate that the integration of renewable energy infrastructure on agricultural land is influenced by existing land uses. For new actors in the energy sector, successful implementation depends on their ability to frame the use of the land enabled by energy infrastructures as legitimate. Moreover, the findings show that the integration of agrivoltaics infrastructures does not automatically generate consensus. Rather, agrivoltaics integration depends on the technical ability to produce the appropriate kind of agricultural value and not disturb existing agricultural interests. What counts as appropriate is intermeshed with local norms, territorial orientations and interests of the actors involved. In other words, local land politics.

This chapter contributes to answering the research questions outlined at the beginning of the dissertation. The implementation of agrivoltaics in Reunion affects existing land uses but also the dependencies embedded in both the agricultural and electricity sectors. By confronting the dominance of the sugar cane industry, agrivoltaics challenges prevailing sectoral dependencies. However, depending on the model adopted and its effectiveness in sustaining agricultural production, these infrastructures may also risk reinforcing food dependencies. Such outcomes must nonetheless be understood within a broader agricultural structure in which more than half of the UAA remains devoted to crops that do not directly support food sovereignty. Finally, the analysis demonstrates the power of state-level instruments in regulating the electricity market, while showing how local actors, through land politics, both shape and delay the deployment of renewable infrastructure. While this chapter has primarily focused on agrivoltaics' relations with existing land uses, their implementation also raises

questions about who will benefit from the land: farmers, sugar industrials, or energy developers? Who benefits from the land is explored further in the next chapter on the integration of solar and wind technologies in Martinique.

7. Who Should Benefit From the Land? Intermittent Energy and Land Politics in Martinique

From the summit of the 'Montagne Pelée', when the sky clears, hikers can see the northern slopes of the volcano stretching down to the Atlantic. In the distance, seven wind turbines rotate slowly above the coastline. One of the lesser-traveled trails from the summit crosses directly through the wind park, located on a sugar cane plantation. This estate, owned by a long-established 'Béké' family, embodies the enduring hierarchies of land and power in Martinique. From its high vantage point, it overlooks the village of Grand'Rivière, which lies far below, at the island's northern tip. Reached only by a single winding road, by sea, or by footpaths, Grand'Rivière is a quiet enclave, home to an ageing population. Few tourists venture every day and fill the guesthouse or the seafront restaurant, overlooking the small harbor. From the center, only a few vantage points reveal the presence of the wind turbines.

The village's calm was disrupted when residents learned that new turbines would be installed on a neighboring plantation. While the first wind park had been built without open conflict, this new project quickly met local opposition. The controversy did not focus on the turbines themselves, but on the transportation-route planned for their delivery. The massive components would have to cross the two historic bridges linking Grand'Rivière to the rest of Martinique. Residents feared the transport would damage these fragile connections and deepen their isolation. Behind the immediate concerns over the turbine transport, residents also voiced deeper grievances about the project's unfair distribution of benefits and the lack of consideration expressed towards their concerns, repeating old patterns. Eventually, the regional authority prohibited the developer from using the bridges. After several months of deadlock, construction resumed. Wind turbines are now being transported using an alternative route, all the way from Fort de France to the wind park location, circumventing Grand'Rivière altogether.

This chapter extends beyond the case of Grand'Rivière and shows how land-based renewable energy projects in Martinique similarly revive old colonial tensions while also opening spaces for re-negotiating who should decide over, or benefit from, the land and the energy transition.

7.1. Introduction

Fossil-based electricity systems are notoriously centralized and oligopolistic. In this context, the entry of intermittent renewable energy such as wind and solar into the market is often portrayed as a game-changer. By opening the market to new actors and spreading production centers across localities, renewables have the potential to redistribute decision-making power and financial streams. Such changes could significantly alter the structures of territorial power by challenging who controls and benefits from the resources extracted from a particular space.[58]

In the context of Martinique and Reunion, the integration of renewables has been associated with gaining material but also political forms of autonomy (Chapter 5). Yet, renewable energy development takes place within a system designed around centralized management, favoring dispatchable forms of energy and concentrated markets. Intermittent renewable energy can either provoke a change or find ways to adapt to the existing system. As the energy transition unfolds, it appears that the latter has been favored as incumbent fossil actors develop utility-scale renewables, molding the materiality of intermittent energy to the needs of the existing system. In her work on solar capitalism, Sofía Ávila Calero (2025) argues that this implies "forcing the spatiotemporal profile of flow and common resources to work in terms of stock and enclosable energy resources." (Ávila Calero 2025, 2). In other words, making renewables work like fossil fuels to avoid substantially altering the existing system. Central to this process is access to enough and well-situated land to ensure profitability (McCarthy 2025), but also the manageability of these new resources as they enter a grid originally designed for dispatchable energy. Access to the electricity market and its financial revenues, therefore, takes place through the proxy of access to land.

[58] Concept of territorial power explained in more detail in Chapter 2

In Martinique, the electricity sector is characterized by a series of dependencies due to its reliance on imported fossil fuels and the dominance of EDF and the State over energy affairs (Chapter 4). The isolation of the grid weakens grid stability and heightens concerns over the intermittency of renewable energy. Moreover, land for renewables in Martinique is constrained by the large share of protected natural areas on the island, urbanization needs, and agricultural activities. Agricultural land's relative scarcity, concentrated ownership, and cultivation for export crops create pressure on the food dependency of the island. The unequal and colonial structure of agricultural land further shapes the land politics of Martinique, where social tension surrounding the enduring economic dominance of the *Békés*—a socio-racial class associated with slavery owners and plantations—remains deeply present.[59] Therefore, renewable energy development in Martinique must operate within the pre-existing electricity market and governance structure, as well as with the particular land politics of the island. This means that, on the one hand, renewable energy integration may alter who decides on energy matters and who can benefit from the electricity sector. On the other hand, it could reinforce unequal patterns of resource distribution, sustaining the food dependencies they produce (as argued in Chapter 4).

The renewable energy strategy of Martinique is based on the inclusion of two types of energy resources: dispatchable energy (biomass, biofuels, geothermal energy, and hydropower) and intermittent energy (solar and wind). Dispatchable energy is often advocated for its ability to provide stability to the grid, given the intermittent nature of wind and solar sources, without relying too heavily on storage capacities. In Martinique, Albioma's biomass plant, Galion 2, has provided renewable, yet dispatchable, energy since 2018.[60] This plant primarily operates on imported wood pellets, with only a marginal reliance on local biomass. Contributing to 18% of the island's electricity needs, Galion 2 transformed the monopolistic structure of the

[59] The structure of the agricultural sector in Martinique is introduced in more details in Chapter 4.
[60] Martinique's electricity mix is presented in Chapter 4.

electricity market into a duopoly-like regime, in line with its historical role in other territories like Reunion or Guadeloupe (Rivière and Ducastel 2024). The biomass plant does not challenge grid operation, EDF's role as the main producer, nor fiscal revenues for local authorities, as the plant still relies substantially on imports. By contrast, intermittent sources of energy, wind and solar, create pressures on grid stability, tend to include more actors, and do not provide import-based fiscal revenues.

Given the limited challenge that the biomass model poses to the existing regime, this chapter examines how intermittent energy, wind and solar, challenge the dispatchable, centralized system and their influence on the current resource access structure. As discussed in Chapter 2, resources and access to resources are vital for establishing territorial power. Access is defined here as "the ability to benefit from things", where resources serve as means to capture financial revenues (Ribot and Peluso 2003, 153). These include land and its productive potential (such as agricultural output and electricity) and, more broadly, market power within the electricity sector. The term 'structure' refers to who has access, who grants access, and under what conditions. It is the arrangement of actors, institutions, and social relations through which access is granted and regulated.

In this chapter, I investigate whether and how intermittent renewable energy has affected who can access resources and who holds decision-making power over them. Specifically, I analyze the impact of wind and solar energy on Martinique's territoriality—the structure that organizes control over a geographic area and the extraction of its resources. Or in simpler terms, I explore who (should) benefit from the land and resources. In doing so, the chapter examines how these developments affect the structural dependencies spanning the electricity and agricultural sectors.

The analysis draws from on a combination of data sources, including interviews, document analysis, and observation notes, including site visits and participation in public workshops

(Chapter 3). I have also collected cadastral and geospatial data on installed and planned wind and solar infrastructures. The list of planned infrastructures was retrieved from the analysis of all calls for tenders issued between 2015 and 2024. The data analyzed concern utility-scale infrastructure, which includes all installations with a capacity of over 1 Mega Watt (MW). [61] It is important to note that installations above 1 MW account for only 4.6% of the total PV capacity in Martinique (EDF Open Data Martinique 2024). Despite this small share, they remain central: their scale makes them highly visible, and a single park can weigh significantly on grid management.

I argue that intermittent renewables have not fundamentally restructured those who decide over or have access to the electricity market. Instead, incumbent energy actors have maintained control over the sector, leaving sectoral and institutional dependencies relatively unchallenged. In addition, wind and solar energy have contributed to reinforcing historical patterns of wealth accumulation and monocultural usages of the land in the form of 'energy plantations'(Stock 2023). Nonetheless, I also show that this model of solar and wind development is contested by local actors as they leverage land-specific regulatory tools. Through such processes, intermittent energy has provided new grounds for challenging the existing resource access structure on the island by questioning the dependency upon a few actors that own disproportionate shares of the land and benefit from it.

This chapter starts by outlining the structure of the incumbent fossil-based system, preceding the energy transition. I then follow the development of wind and solar along two dimensions: 1) who has access to the electricity market and its revenues, and 2) who holds decision-making power over wind and solar development. I then examine how the two dimensions of access and decision-making are intertwined with local land politics. Finally, I discuss the

[61] Utility-scale renewables refer to large renewable energy projects. What counts as large varies on the context with definition starting at 1MW to others mentioning a threshold of 10MW. Given the relative size of Martinique, 1MW was chosen as the threshold for the study.

impact of the results on the resource access structure of the electricity sector and its effects on Martinique's territoriality.

7.2. The Incumbent: Imported, Dispatchable Energy

The electricity sector of Martinique has historically been structured as a state-led, centralized, monopolistic system relying on dispatchable energy from imported fossil resources. From the end of the 20th century, Martinique's electricity system has been centrally controlled by the State, as the sole legislator over energy affairs and owner of EDF, which produces, distributes, and manages electricity. The grid itself is owned by an inter-municipal authority, the *Syndicat Mixte d'Electricité de la Martinique* (SMEM), which concedes grid management to EDF. The production of electricity is ensured by two main units powered by EDF: The thermal power plants of Pointe Carrière (81 MW) and of Bellefontaine (212 MW). Each plant is also complemented by oil-fired combustion turbines used during peak demand.[62]

The reliance on oil, while causing concerns over the dependence of the electricity sector, offers three benefits. First, oil is dispatchable. It can be stored and managed centrally and only requires land 'elsewhere', favoring a top down-governance and management structure (Mitchell 2011). Second, imports, including fossil fuels, are subjected to a local tax, inherited from colonial times, known as the *Octroi de Mer*. Revenues derived from fossil resources are important resources for overseas territories' local budgets (Ory 2020; Ducastel 2024).[63] The dividends from the *Octroi de Mer* are re-distributed by the regional authority, the *Collectivité Territoriale de Martinique* (CTM), to municipalities. Local authorities are therefore direct beneficiaries of the import-based electricity system. And third, the current electricity system is a source of employment in a tense job market. The SARA, the local oil refinery, delivers oil to

[62] More information in the production park is available in Chapter 4.
[63] From currently available data, it is not possible to estimate the size of the revenues extracted from fossil-based electricity production. Nonetheless, in Martinique, refined and unrefined fossil resources (this includes resources used for transport and not only electricity) accounted for 21.3% of total imports in 2023 for a value of 744 million euros (INSEE 2024).

the rest of the French Antilles and to French Guiana and employs a little over 330 people (Guitteau 2024). Similarly, EDF counts around 500 local employees, who are therefore indirect beneficiaries of the electricity system (EDF Martinique 2025). The indirect connection between the energy system and employment has been pointed out in the work of Rivière and Ducastel on Guadeloupe (2024). This is not further investigated in this chapter but nonetheless remains one factor to understand the broader societal function of the electricity market on the island.

Two main changes take place at the beginning of the 2000s: the liberalization of energy markets in the EU and the introduction of a special tax on electricity. The liberalization of the energy market meant for EDF a change in status from a public enterprise to a public limited company (Société Anonyme, SA), introducing it to the stock market, though still owned by the French State.[64] In Martinique and other French insular territories, EDF's activities were divided between **EDF-SEI**, which ensures the retail, distribution, and transport of electricity, and **EDF-PEI**, which produces it. Yet, in derogation of the EU regulation, EDF was allowed to retain its position as the sole electricity distributor in Martinique and other zones disconnected from the mainland grid.

Introduced in 2003, the special tax on electricity, (previously called the CSPE, known as the *Accise sur l'électricité)*, is levied directly on the bill of all electricity consumers in France, used to compensate energy providers for additional costs linked to public service obligations imposed by law. This system has been crucial to ensure that consumers in non-interconnected zones (ZNIs), where the cost of electricity production is substantially higher, pay a price equivalent to consumers in mainland France. This is the price equalization mechanism.[65] In

[64] Law n° 2004-803 of the 9th of August 2004 stipulates that the state must own a minimum of 70% of the company's shares. In 2023, EDF this threshold is brought up to 100%, enacting the re-nationalization of EDF by the law n° 2024-330 of the 11th of April 2024.

[65] The price equalization mechanism has been introduced in the glossary and in Chapter 4.

the ZNIs, EDF is compensated through this tax for the difference between the price it charges electricity consumers and the cost of production. This mechanism is supervised by the *Commission de Régulation de L'Énergie* (CRE), the public authority for energy regulation in France, which calculates price compensations and necessary investments.

This system has two main implications. First, the affordability of electricity in these territories is directly dependent on public financial transfers from France, orchestrated centrally by the State and the CRE. Second, it contributes to the centrality of EDF which benefits primarily from this mechanism, which relies on the exchange of information between EDF-SEI and the CRE, giving "them a decisive influence over the industry regulation" (Rivière and Ducastel 2024, 506). The diagram below summarizes who has access to the electricity market and its revenues, and who holds decision-making and regulatory power.

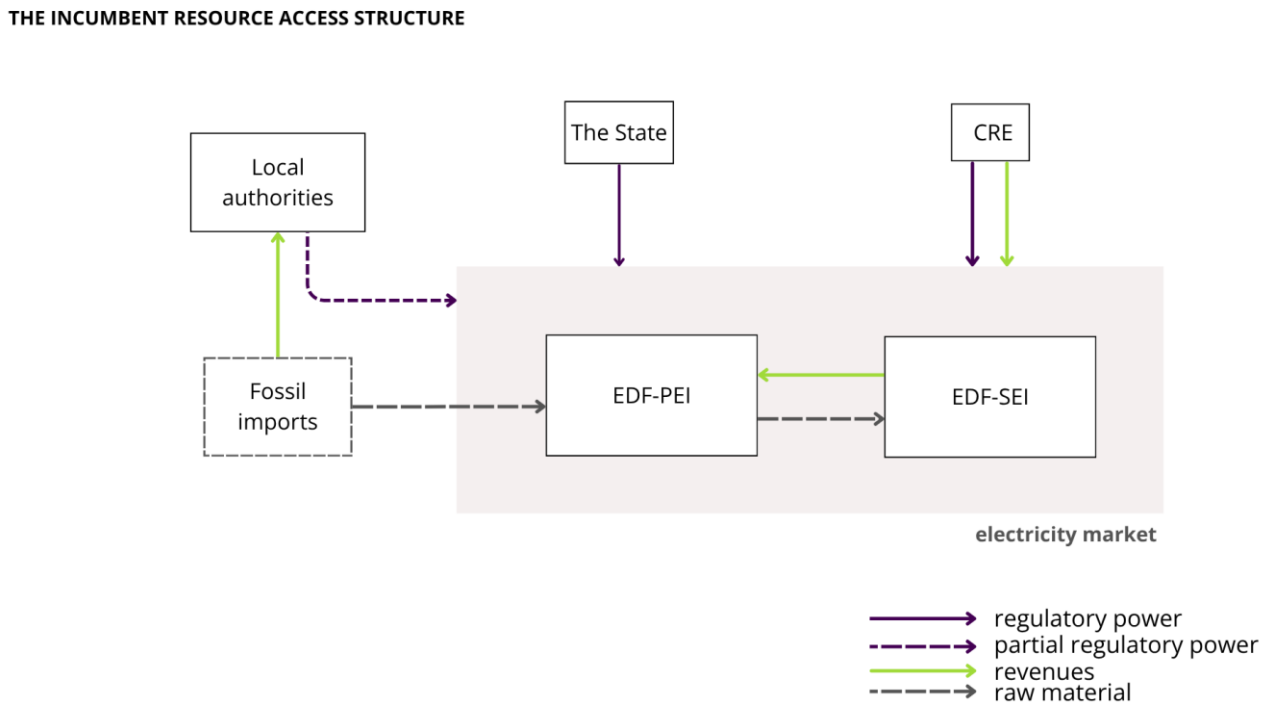


Figure 8 The Incumbent Resource Access Structure, Made by Author (2025)

The resource access structure of the incumbent electricity sector is therefore characterized by a top-down governance structure whereby the State is the main legislator and EDF is able to

capture the revenue streams from the electricity market in the form of public spending. The power of the regional authority and other local bodies is limited. Nonetheless, this system also funds local public budgets through import revenues. This structure reflects two of the key dependencies identified in Chapter 4: namely, institutional dependencies, characterized by the power of the State and its agencies; and sectoral dependencies, induced by the concentration of the electricity market. The next section discusses the changes to this structure caused by the development of intermittent energy.

7.3. The Alternative: Locally Produced, Intermittent Energy

7.3.1 Who Has Access to the Electricity Market and Its Revenues?

Solar and wind have opened the market to new actors and new revenue streams, as illustrated in the diagram below.

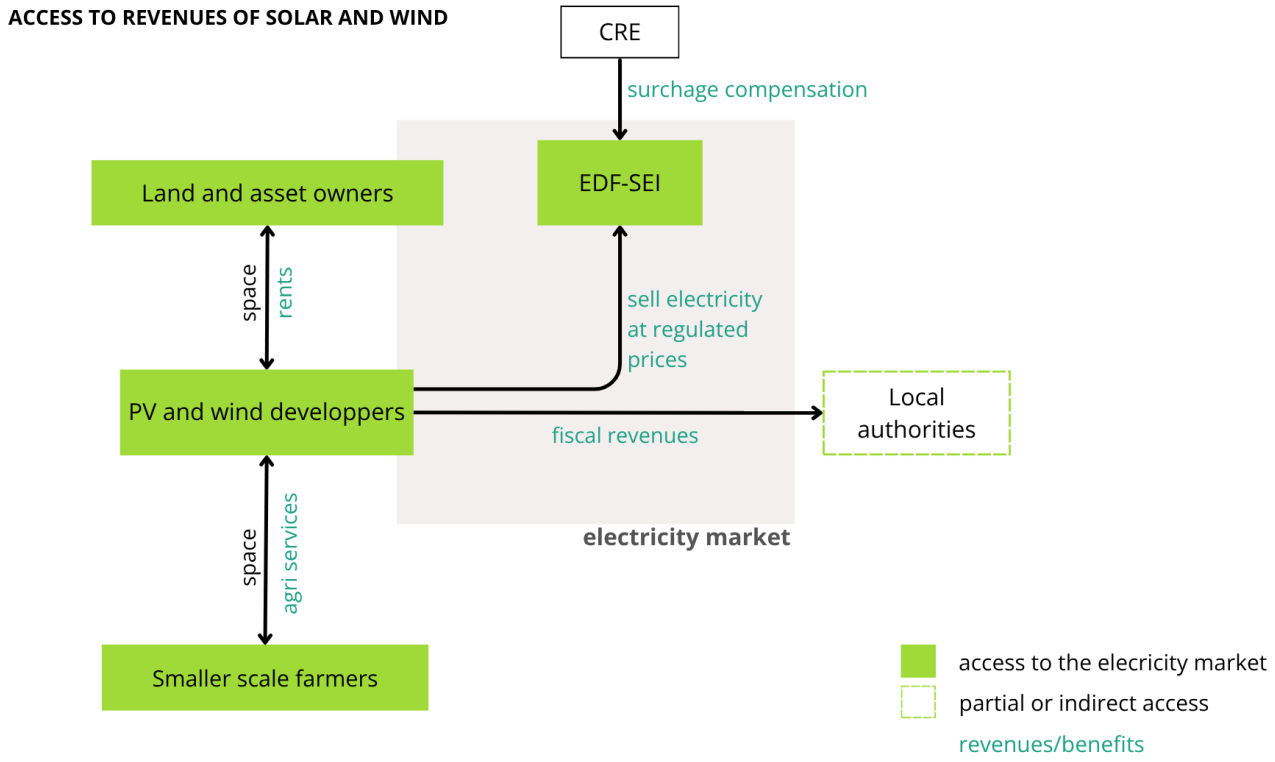


Figure 9 Access to Revenues from the Solar and Wind market, Made by Author (2025)

7.3.1.1. Wind and PV developers

New actors are principally wind and PV developers, who, by selling electricity, gain access to the market and its revenues. These developers benefit from selling their electricity to EDF-SEI at a regulated price fixed by the CRE guaranteed for 20 years, ensuring safe returns upon investments and the ability to invest further (Rivière and Ducastel 2024). This, however, costs EDF-SEI which is required by law to purchase the electricity at the regulated price, as the 'obliged buyer'.[66]The extra costs or surcharges are compensated for by the tax on electricity (*L'accise sur l'électricité).*

While more companies are now producing electricity in Martinique, the utility-scale electricity market is dominated by a few actors, including subsidiaries of EDF and Albioma. The figure below lists energy providers' cumulated capacities of utility-scale solar (over 1MW) and wind in order of importance.

[66] *L'acheteur obligé* is the entity that is legally required to purchase the electricity produced by renewable energy generation facilities. In the case of Martinique, EDF-SEI.

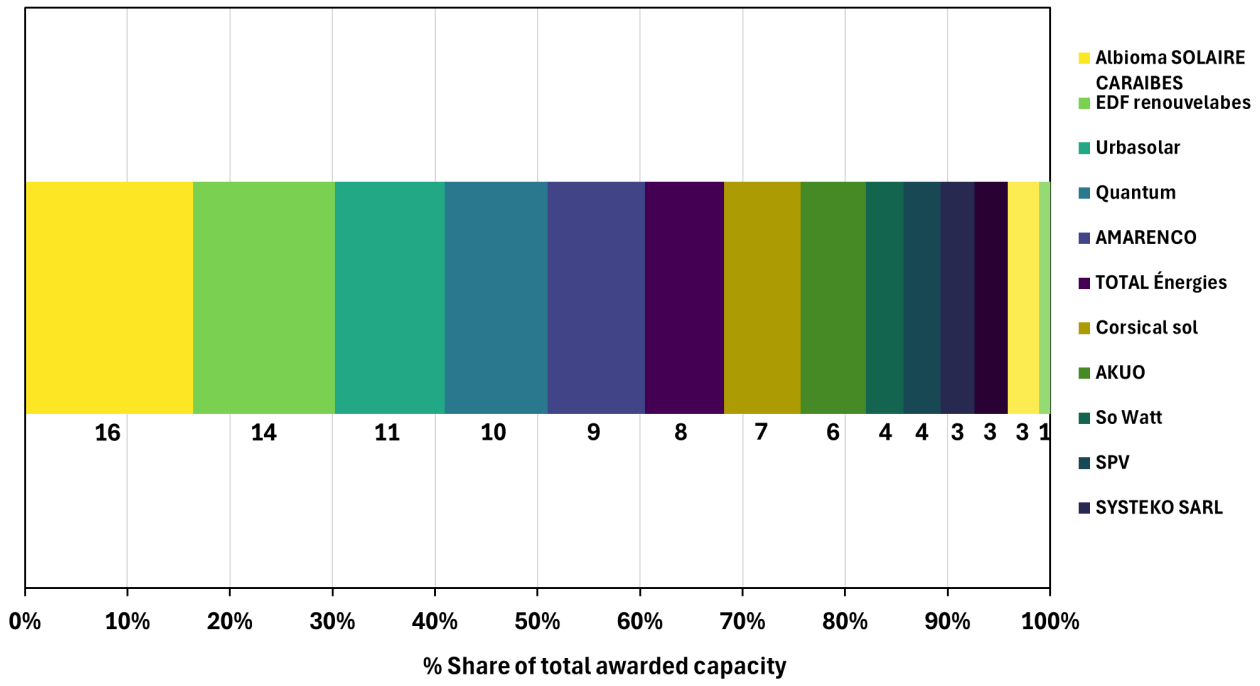


Figure 10 Share (%) of Installed Capacity of Intermittent Energy per Energy Producer in 2025, Made by Author (2025).[67]

Solar energy accounts for the majority of utility-scale infrastructure (26.9 MW). In comparison, the total installed wind capacity is 14MW. Yet, when considering past and projected infrastructures, wind power is an integral part of the energy sector. Total Énergies exploited Martinique's first wind park in Le Vauclin until its decommissioning in 2022. Opened in 2019, the wind park GRESS (14 MW) is the only wind park currently in operation. The project is exploited by the company of the same name, GRESS, whose principal shareholders are the energy groups NW Energy, EDF, and Total Énergies. NW Energy is also currently building two new wind parks near GRESS (GRESS 2 & 3), which would add 24 MW of wind power to Martinique's energy grid.

Other planned installations follow a similar pattern of relative market concentration. In the case of photovoltaics, 42 photovoltaic projects have been awarded by CRE's calls for tenders

[67] See Chapter 3 for the allocation method.

won by a total of 14 companies and their subsidiaries.[68] The companies that have been awarded the most projects in terms of total capacity are Albioma (16.4%), EDF Renouvelables (13.8%), Urbasolar (10.7%), Quantum (10.3%), and Amarenco (9.49%). Together, Albioma and EDF Renouvelables have won 30.2% of the total capacity awarded by CRE calls. These 14 companies operate internationally, half of them without permanent representation or offices in Martinique. Two local players, So Watt and Systeko, stand out as smaller companies operating solely in the Antilles-Guyana region, which have respectively managed to win around 3% of the total capacity over time.

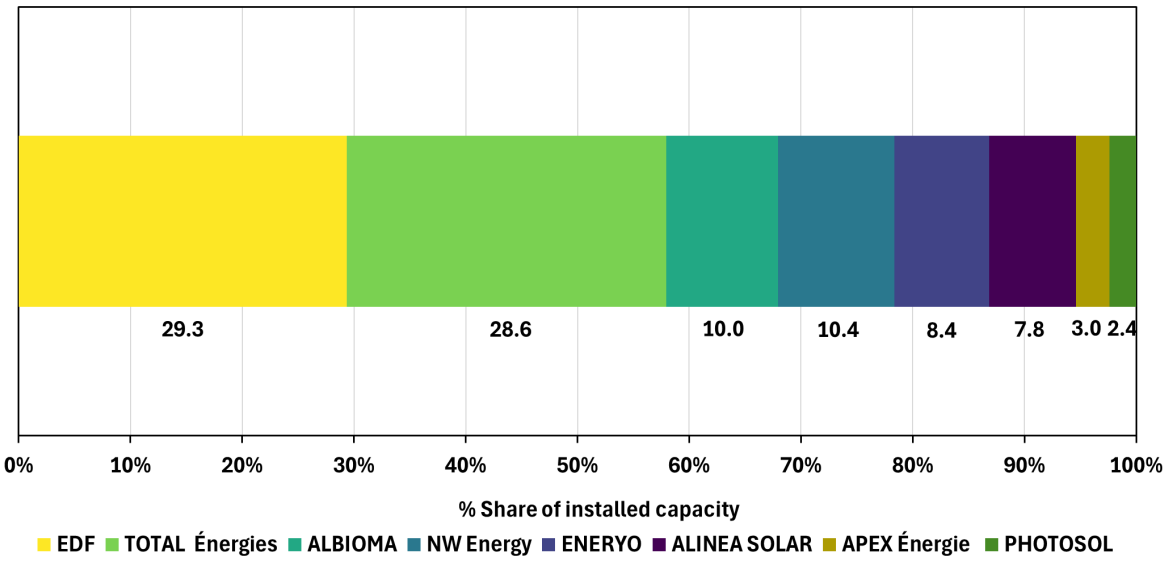


Figure 11 Allocation of Awarded Capacities by the CRE per Energy Producer, Made by Author (2025)[69]

Only one call for wind installation was issued in 2010, with two winning projects in the North of the island, respectively won by *EDF Renouvelables* in association with the Monplaisir Group and Aerowatt, a subsidiary of Total Énergies. [70]

[68] Excluding self-consumption calls.
[69] Based on CRE calls see Chapter 3.
[70] https://www.pappers.fr/entreprise/aerowatt-énergiess-518035845

Therefore, revenues from the utility-scale electricity market and public funds are captured by a few actors, without dethroning EDF's and Albioma's relative power position in the market, favoring large international market players such as Total Énergies. This leaves the sectoral dependencies of the electricity sector relatively unchallenged. Yet, to access the electricity market and its revenues, electricity producers must first secure land or surfaces suitable for installing solar or wind infrastructure. This demand for land across the island introduces new revenue opportunities for local authorities and brings two new actors into the electricity market's revenue streams: land or asset owners and farmers.

7.3.1.2. Local authorities

Local authorities, including municipalities, inter-municipal entities and the regional authority share the revenues derived from a tax applied to renewable energy infrastructures, namely the *imposition forfaitaire des entreprises de réseaux (IFER).* In 2024, the default rate was 8.36 euros per installed kW, with a reduced rate of 3.48 euros applicable to newly installed PV infrastructures.[71] In the case of the GRESS wind park in 2024, according to my own calculations, local authorities should have perceived around 100 320 euros, out of with only 20% (20 064 euros) would have been perceived by the municipality.[72] Therefore, the revenues extracted by local authorities for intermittent renewable energy infrastructures do not constitute a substantial revenue stream. The lack of revenues from wind parks was pointed out in the context of the GRESS wind park of Grand Rivière. As this resident explains: "For two years, we waited, we waited for this tax, and we had to speak out to finally get it. And when

[71] This reduced rate applies for the first 20 years to PV installations put into service after 1st January 2021. After 20 years, these installations are no longer eligible for the reduced rate, and the standard 8,36 €/kW rate applies again.

[72] These amounts were calculated based on the installed capacity of the wind park multiplied by the taxation rate of the IFER for 2024. The law specifies that installed capacity is to be calculated based on the sum of the maximum active power injected at the delivery point and the self-consumed power, not the mechanical capacity of the turbines (Law No. 2015-992 of August 17, 2015, Article 104, II). In this scenario, I used 12000 Kw as the installed capacity of reference, as this is the capacity often reported for the park on public documents.

we did get it, we saw that it was just crumbs, really just crumbs" (IntMA2, resident of Grand Rivière).

7.3.1.3. Landowners and Farmers

Landowners and farmers access revenues from the electricity market through the siting of renewable infrastructure on agricultural land, with six of nine utility-scale parks installed on classified agricultural land. This is illustrated in the table below.

Table 11 Utility-Scale Solar and Wind Parks per Type and Land Classification

name	date	resource	installed capacity (MW)	type	land classification
GRESS	2019	Wind	14	onshore	agricultural
Potiche	2011	PV	4.7	ground-mounted	agricultural
Lassalle	2010	PV	4.5	ground-mounted	agricultural
Parc de Ducos	2011	PV	4.1	ground-mounted	no data
Centrale de la SARA	2019	PV	4	ground-mounted	urbanized
Parc du Lorrain	2012	PV	3.8	ground-mounted	agricultural
Ferme Agrisolaire du Diamant	2016	PV	2.5	ground-mounted	no data
Hangar Agricole de Ségur	2021	PV	1.3	PV warehouse	agricultural
Parc Lazaret du Robert	2011	PV	1	ground-mounted	agricultural
Socomor	2011	PV	1	roof	urbanized

The GRESS wind park and the upcoming GRESS 2 and 3 projects are sited on two neighboring *habitations* in the North of the island, namely Potiche and Beauséjour, both owned by families identified by participants as *Békés*.[73]

[73] See Chapter 2 and 4. *Habitations* are the name given to colonial plantations. In Martinique, several agricultural domains have retained the name of habitations, despite their association with slavery and indentured work. Malcom Ferdinand's book on decolonial ecology offers a compelling analysis of the meaning of the word *habitation* in the French colonial context.

Picture 8 Location of the 'GRESS' Wind Parks and the 'Potiche' PV Park in the North of Martinique, Made by Author (2025)

These projects are located on agricultural land used for sugar cane cultivation. By renting their land to wind energy developers, the landowners derive indirect financial revenue from the electricity market. These wind projects are therefore based on an alliance between large energy companies and large landowners. Similar partnerships were observed in the PV sector in the 2010s, sometimes involving the very same landowners. The owner of Potiche, where GRESS 2 and 3 will be located, already hosts the island's largest PV park. Likewise, two PV projects (13.6 MW and 7.1 MW) were planned on the grounds of Beauséjour, now home to GRESS, but were later revoked by the regional authority.

The outcomes of these two PV parks, one installed, the other prevented, represent two distinct stages of photovoltaic development in Martinique. The first period, from 2006 to 2012, was characterized by the corporate-large landowner alliance observed in the case of wind development. This period ended as growing discontent with these installations culminated in 2013 with a ban from the regional authority on PV projects on agricultural and natural land.

From that point onward, PV developers had to seek new partnerships to secure land, opening the electricity market to other asset owners and smaller-scale farmers.

Over the first period, solar developers negotiated contracts with large landowners involved in the cultivation of sugarcane or bananas, often associated with the socio-racial class of *Békés.* Under this model, PV developers set aside a percentage of the earnings derived from the production of electricity for rents offered in exchange for access to the land. Others, like in the case of Albioma's *Lassalle* PV Park, purchased the land. Therefore, both landowners and PV producers benefit financially from PV development. Over this period, PV parks were financed through feed-in tariffs, which, until the moratorium in 2010, were relatively advantageous. According to interview participants, this allowed for sizable rents to be offered to landowners.

Therefore, at the beginning of the period, a convergence of interest between solar developers and large landowners led to the development of the first few large-scale PV projects. Given the financial opportunity presented by solar over this time period, seven utility-scale parks were installed over the 2010-2012 period and seven more were granted permits, all sited on historic plantations, owned by large landowners involved in banana or sugar cane production (Ory 2020). These were considerably larger than the biggest park of Martinique (4.7MW), ranging from 13.6 to 5.7 MW. Yet, they were eventually prevented by a deliberation of the regional authority in 2013, a stalemate marking the beginning of a new era of PV development.

Over the second period, installing solar parks became less financially advantageous and increasingly regulated, particularly for ground-mounted PV. Energy developers needed to find new strategies to secure exploitable surfaces for PV while providing less advantageous rents in exchange. In general, this strategy involved finding alternative ways to access land

and surfaces without relying on large landowners. These changes introduced new beneficiaries from solar development, namely smaller farmers and owners of large buildings.

Energy developers started proposing solar installations that could be combined with agricultural activities. These include the construction of solar warehouses or agrivoltaics installations.[74]

Picture 9 Solar Warehouse from the Outside, Case-Pilote, Taken by Author (2023)

[74] At the time of the fieldwork, permits for agrivoltaics systems had been granted, but were not yet installed.

Picture 10 Solar Warehouse from the Inside, Case-Pilote, Taken by Author (2023)

These models primarily rely on the agricultural benefits that can be derived by farmers, rather than on the rent offered by the energy producer, given the higher cost structures of such projects and low feed-in tariffs. As such, energy developers reach out to a different category of farmers than those targeted for ground-mounted PV. They tend to go for medium-sized farms, not or marginally involved in banana or sugar cane production, and more likely to accept smaller financial compensation.[75] The shift from large landowners to mid-size farmers can be explained by the lack of rent incentives, deterring actors attracted by the potential of large revenue streams. This fruits and vegetables farmer from the north of Martinique who is regularly solicited by solar developers, observes the following:

> "They don't approach big landowners because it could cause an ecological outcry, it could spark too much ecological misunderstanding from associations. The big landowners are pure capitalists, meaning they're not interested in someone making money off their land unless they're the ones in control. So, you see, they say, 'No

[75] The farms visited hosting such infrastructures were around 4-12 hectares. These are mid-sized in Martinique where the average size is of 8,2 ha (Agreste 2023). Yet, half of the farms have less than 3 hectares with a high number of 'micro-farms' (90% of farms), despite only occupying 40% of the Used Agricultural Area (Agreste 2023).

> thanks, I don't want to lease my land,' especially since large-scale crops still bring in a lot of money thanks to the subsidy system." (IntMA27, farmer)

As an alternative to ground-mounted infrastructures, solar developers try to secure market space by renting large rooftops, situated on commercial and industrial buildings. Large roof surfaces are rare and controlled by a limited number of actors in the agro-industrial sector.[76] This influences PV development as a few actors can decide to open or restrict access to their roofs and contribute to reinforcing already powerful economic actors. PV developers struggle to secure new roofs as the rent they can offer is constrained by low regulated prices:

> "Since the rates are low, the rents offered to property owners aren't what they used to be, so many of them tell us, 'I'm not going to block off my roof for 20 years for that kind of rent.' I mean, they have large industrial buildings, with activities underneath that already bring in a lot of money. So, when we tell them, 'Your roof will earn you €6,000 a year,' they say, '€6,000 a year? I'm not going to block off my roof for that." (IntMA25, solar developer)

As this section has shown, the inclusion of intermittent renewable energy has extended the beneficiaries of the electricity markets and the type of revenue that can be derived from it. However, this extension has mostly taken place through the land requirements of wind and PV, which require compensating involved actors, rather than through the opening of the electricity market to a variety of producers. Therefore, wind and solar have not substantially restructured the beneficiaries of the electricity market and have favored the wealth accumulation of existing asset owners. The next section discusses how the inclusion of intermittent renewable energy has opened new avenues for decision-making.

7.3.2 Who Regulates Access and How?

Intermittent renewable energy has provided new means and tools for both new and incumbent actors to exert control over the electricity market. Some of these new means are purposely intended to control the energy transition. Others are not meant to regulate the energy

[76] The ownership of large surfaces is linked to the oligopolistic structure of the Martinican economy whereby a few groups exert control over commercial and industrial activities, which includes the physical buildings attached to these activities (Numa 2018; Célestine 2018).

transition but are used by actors to regulate intermittent renewable energy uptake during implementation stages. These tools, their users, and their application in practice are discussed below.

7.3.2.1. Strategic Tools and EDF's Regulatory Tools

The Pluriannual Energy Planning (PPE) outlines the key strategies to be taken by Martinique in terms of energy governance, including capacity targets per renewable energy resources. It also lists potential projects to be developed or researched, granting additional weight to these projects in the financing and permitting stages. Unlike other regions of France, overseas territories have their own PPE, elaborated jointly by the State and the regional authority. As such, thanks to the PPE, the regional authority moved from having little to no power over the energy sector of the island to a co-planning role. The PPE is drafted by a steering committee directed by civil servants from the regional authority and relevant state services (i.e., DEAL). This committee also includes other organizations, namely the ADEME[77], the intermuncial electricity authority (SMEM), the Syndicate of Renewable Energy (SER) and EDF-SEI.

A second strategic tool is the Energy Transition and Management Plan, known as the PTME.[78] Rather than a plan, the PTME consists of a coordination committee that meets to agree on the necessary means and orientations to be taken. It can also make decisions to support renovation or research projects. The actors involved in both committees are listed in the table below.

[77] France's environmental agency for the ecological transition
[78] *Plan de Transition et de Maîtrise de l'Énergie*

Table 12 Members of the PPE and the PTME Committees

Actors	Description	PPE	PTME
CTM- Collectivité Territoriale de Martinique	Regional Authority of Martinique.	co-president	member
DEAL Martinique- Direction de l'Environnement, de l'Aménagement et du Logement de la Martinique	French state services under the authority of the prefect. It implements public policies related to the environment, planning and housing.	co-president	member
EDF SEI- EDF Systèmes Energétiques Insulaires	Electric provider, distributor and grid manager.	member	member
SMEM- Le Syndicat Mixte d'Electricité de la Martinique	Intermunicipal authority overseeing EDF's role as grid manager.	member	member
ADEME- Agence de l'environnement et de la maîtrise de l'énergie	France's national environmental agency to support the ecological transition.	member	member
SER- Syndicat des énergies renouvelables	France's main professional association for the renewable energy sector.	member	not a member
AFD-Agence Française de Développement	France's public development bank.	not a member	guest

The State remains strongly represented, directly by the DEAL, indirectly by EDF-SEI. EDF-SEI's inclusion within both committees stems from its dominant position in the local energy sector. As supplier and manager of the grid, EDF-SEI retains important information for energy planning, such as information on the grid structure and its capacities. For this interviewee from the ADEME, this creates a problem of transparency:

> "It is a public network: it doesn't belong to EDF, at least not the distribution network. It belongs to the SMEM, meaning the municipalities. And even the SMEM doesn't have enough information about its own network, which is managed by EDF. So, the first key issue is really transparency regarding the network and its capacity."(IntMA12, employee, ADEME)

EDF is also actively involved in the drafting and steering of the PPE and the PTME as recognized by this representative of EDF-SEI, which nonetheless considers that their involvement has decreased in the drafting of the upcoming revised PPE:

> "With the PTME and the former majority of the regional authority, we still did quite a bit of work, because the first PPE was really done almost entirely, well, practically from start to finish, with EDF."(IntMA8, employee for electrical systems and energy transition, EDF-SEI)

EDF SEI regulates the energy transition in two more ways through its role as grid manager and distributor. First, EDF is responsible for setting the disconnection threshold, the maximum share, in this case 35%, of intermittent renewable energy that can be injected before EDF may disconnect renewable energy production units to maintain grid stability. Second, EDF is responsible for the grid connection of new solar and wind infrastructure. However, all solar developers interviewed complained about the substantial delays occurring at this stage, affecting the projects' cost structure. This issue was also brought up by solar developers during the public preparatory workshops for the second version of the PPE. When interrogated on why these were occurring, solar developers and local energy policy makers blamed the lack of prioritization of the issue, or the limited workforce dedicated to grid connections. Off the record, however, the ultimate motivations of the group in potentially delaying the integration of renewable energy were questioned.

While EDF does publicly support the development of renewable energy and is also involved in the production of solar energy via its subsidiary EDF Énergie Renouvelables, new renewable energy capacities do challenge EDF's role as a grid manager. The management of supply and demand, as well as grid stability, is more complex than with centralized energy production units operating with dispatchable energy. For this interviewee, working on facilitating the energy transition on the island, EDF-SEI is officially supportive of renewables, "but they're gritting their teeth because it's an intermittent energy source that annoys them." (IntMA12, employee, ADEME). This reluctance was confirmed during the interview with a representative of EDF-SEI who takes a careful stance towards 'unsynchronous' forms of energy, which could endanger the 'quality of the supply'. The careful stance of EDF-SEI towards intermittent energy could be problematic given EDF's regulatory power over the electricity market.

7.3.2.2. Call for Tenders, Tariffs and Power Purchase Agreements

Intermittent energy is sold to EDF-SEI at regulated prices based on three mechanisms set by the CRE; tariffs, calls for tenders or power purchase agreements. Prices set or negotiated through these tools determine the profitability of wind and solar development. The frequency and specification of tariffs and calls for tenders impact the development of renewable energy as project developers wait for new calls or updated tariffs to be issued. Through the call for tenders, the CRE issues technical specifications, including land type, structures, sizes etc that are eligible for the calls. As such, it controls the type and the direction of renewable energy development. Given this regulatory role, the CRE is identified by PV developers and actors of the local energy governance as a critical actor in the transition. In the words of an officer from the State services of the DEAL:

> **"**The CRE has quite a role to play in orientation decisions of economic investments in the transition. It is the CRE that has the hand on the financial envelope that goes off the energy transition, with the DGEC of course,[79] but the CRE as technical, institutional actor has a very important weight**.**" (IntMA1, civil servant, DEAL)

7.3.2.3. Special Legislative Power

In 2011, the regional authority was conferred on a *habilitation énergie* granting it legislative power over energy matters until 2013 and then again until 2021. Mostly used to regulate energy demand or thermal comfort specifications, in 2013, the regional authority used its legislative power to issue a deliberation forbidding ground-mounted PV unto agricultural and natural land and ground-mounted PV over 4 hectares (Délibération N° 13-752-5, 2013). This deliberation significantly restricts the development of large-scale PV parks, which until then had largely favored agricultural land. The impact of the deliberation on PV development was recognized across interviewees. Solar developers and some actors of the governance consider the deliberation to be overly strict, which is "very constraining for project developers who wish to develop in those areas" (IntMA1, DEAL). This contrasts with actors from the local

[79] *Direction générale de l'Énergie et du Climat,* unit of the ecological transition Ministry

civil society and agricultural sectors that find the deliberation absolutely necessary to protect agricultural land.

The *habilitation énergie* ran out in 2021, and while its renewal has been announced as of 2025 the regional authority has not regained its legislative power. During the fieldwork (2023), the renewal of the *habilitation* was discussed in the interview with the regional authority and during workshops as a means to issue new rules and to potentially adapt the deliberation of 2013 to allow for some PV installations, such as agrivoltaics, to take place. In the meantime, the deliberation over PV continues to be applied, and is particularly enforced by the Commission for the Preservation of Natural, Agricultural and Forestry Areas, known as the CDPENAF.[80]

7.3.2.4. The CDPENAF and Local Urbanistic Plans

The CDPENAF is a commission that regulates agricultural and natural land use in France. Since 2016, in overseas regions, this commission has the power to make binding decisions, allowing or not buildings, projects, or modifications brought to natural or agricultural land, based on legal provisions. In Martinique, this commission is composed of representatives of agricultural, energy and environmental interests across governance levels, including professional representation and civil society. The CDPENAF is entrusted to monitor and regulate land use change "from the first square meter consumed" (IntMA42, DAAF) including plans for PV development. In the interviews, the CDPENAF was identified by energy providers and energy governance actors as a constraining factor for PV development. Within the commission, two bodies hold a particularly vigilant stance towards energy development: The state services for agriculture and forests (DAAF) and the local environmental association the ASSAUPAMAR.

[80] Commission Départementale de Préservation des Espaces Naturels, Agricoles et Forestiers

The mission of the ASSAUPAMAR is the protection of Martinican natural and cultural heritage (Chapter 5). It is the island's most active and longstanding environmental organization, known for its anti-colonial positions (Ferdinand 2016).[81] ASSAUPAMAR's members "do not agree at all with putting photovoltaics on the ground, and we say it strongly, heavily" (IntMA36, ASSAUPAMAR). This position is shared by the state services for agriculture (DAAF), whose representative expressed a strong reluctance towards energy projects and a distrust towards energy developers, which they qualify as "vultures". For these members, the deliberation is a useful tool to regulate the integration of PV on natural and agricultural land.

> "We are attentive to making sure that it is not done to the detriment of agricultural spaces, so we are very strict about the regulations. As my colleague said, we have this CTM *(regional authority)* deliberation which, as law, prevents development." (IntMA42, civil servant at the DAAF)

Yet, CDPENAF's decisions are the outcome of its different members, who vote according to their priorities, in line with their jurisdictional level and the applicable legislation. The DAAF itself has to align with other state services like the DEAL and the prefecture "we are also subject to the prefect's opinion. So if the prefect says, 'We give priority to the production of such and such,' well, as a state service, we follow" (IntMA42, civil servant at the DAAF).

The CDPENAF also reviews any modifications to the local urbanistic plans (PLUs) presented by the municipalities. PLUs are particularly important in regulating the implementation of PV and wind installations as they define what the land can be used for, classifying certain areas as urbanized, agricultural or natural. The development of PV on agricultural and natural land is restricted by deliberation and by calls for tenders. The latter generally recommends PV parks to be constructed on land classified as urbanized or to be urbanized. If urbanistic plans do not align with the development of renewable infrastructures, municipalities can modify their local plans by including special provisions allowing for renewable energy development. For

[81] Chapter 5 presents the ASSAUPAMAR in more details.

example, in the case of a PV installation in the municipality of Le François, the site was located in an area classified as natural. To allow the development to proceed, the urbanistic plan was modified to permit electricity production. For wind energy, land use requirements are generally less restrictive. Nonetheless, a similar modification to the urbanistic plan was observed for a wind farm in Sainte-Marie. Discussing the latter, this civil servant responsible for reviewing permitting files for the DEAL shared the following insights on how modifications are carried out:

> *Interview participant:* "So at the level of the municipality, there needs to be a political will, a willingness to develop, so that the urban planning document allows the project to be carried out. And that was the case for the town of Sainte-Marie, where the urban planning document was modified to allow this project to come to fruition.
>
> *Author:* Otherwise, it wouldn't have been possible?
>
> *Interview participant:* No, because we often see today that energy projects are located in agricultural zones or in areas with strong environmental protection. I don't know if you're familiar with the PLU and how it's structured, but we often have 'A' for agricultural zones and 'N' for strongly protected natural zones. So there is a need to link the two, the regulation must allow for it. If we take the case of an 'A' zone, often when there is a modification of the PLU, it becomes 'A' with a little 'e', 'e' for energy, a zone dedicated to energy projects". (IntMA29. DEAL)

This illustrates how, if the municipalities are in favor of the project, cadastral zoning modifications support the development of intermittent energy. Yet, this is not sufficient. The afore-mentioned project of Sainte-Marie for example was eventually abandoned, despite being approved by the CDPENAF. Once projects pass the stage of the CDPENAF, two more means can be used to prevent projects, namely court proceedings and/or local protests.

7.3.2.5. Local Protest and Court Proceedings

For the project of le Francois, the modification of the urbanistic plan was approved by the CDPENAF but against the opinion of the ASSAUPAMAR which then brought the subject matter to court, successfully cancelling the modification and with it the PV project. This method was also used by the ASSAUPAMAR to contest another PV park in Bellefontaine, this time without success.

Local protests have also been used by the ASSAUPAMAR to block projects they were formally opposed to. This was particularly the case in the early stages of PV development, where the association led several protests, directly on site, which led, in combination, to the deliberation in 2013 and to the termination of several projects. Since then, the ASSAUPAMAR has mainly exerted influence as part of the CDPENAF, through court proceedings or social media campaigns.

In contrast, wind parks have gathered more attention from the local population and ad-hoc groups which have protested planned wind projects in the North of the island, in Sainte-Marie and GRESS 2 & 3 in Macouba. In both cases, local contestations and their consequences caused substantial delays and re-negotiation with inhabitants. In Sainte-Marie, the project delays combined with profitability and environmental permitting issues finally led the energy developers (EDF and Monplaisir Group) to abandon the project. Similarly, the wind parks of GRESS 2 & 3 were delayed for several months after the regional authority revoked its authorization for the road transport of the wind panels, in the aftermath of protests from local residents. Such local contestations create pressure on local political elites, who can decide to support appeals for the population even after issuing relevant authorizations. In the case of GRESS 2&3, by using existing administrative tools, the regional authority exerted influence over the development of the wind park and by extension the energy transition of the island.

The diagram below summarizes the tools and actors involved in the regulation of wind and solar uptake.

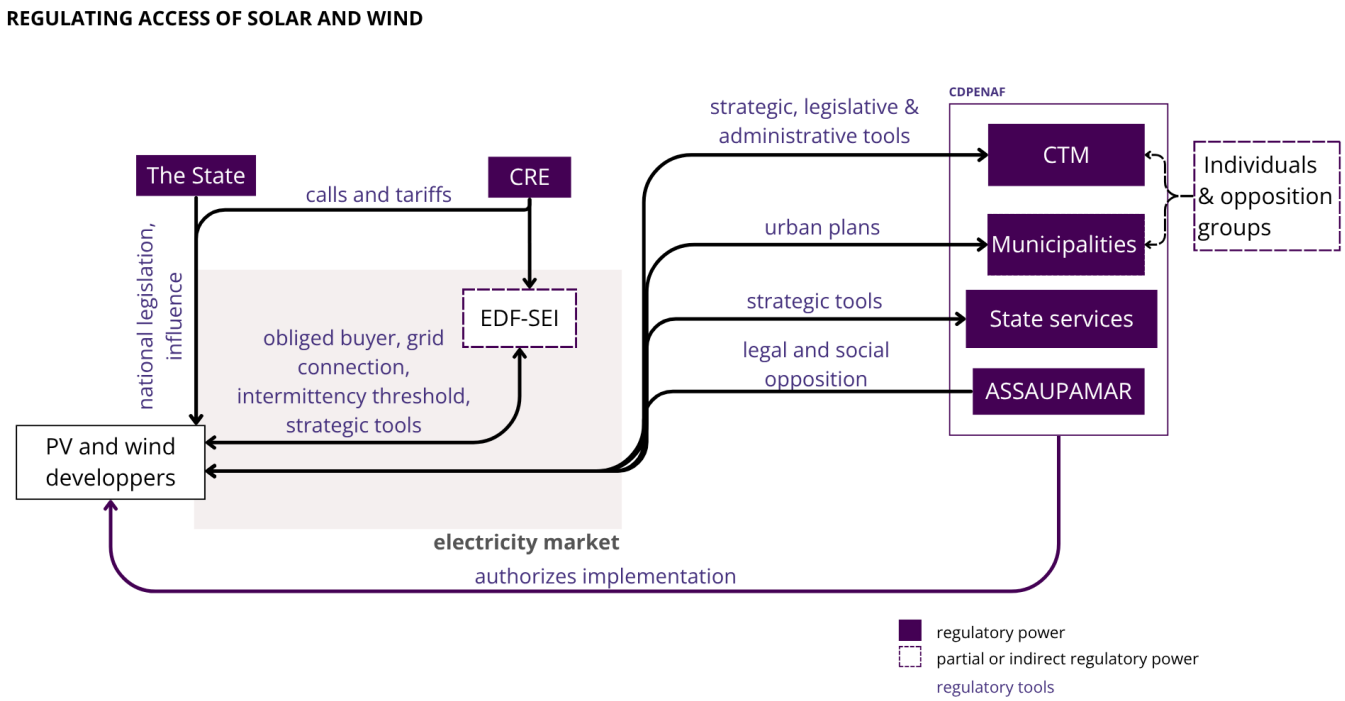


Figure 12 Regulating Access to Solar and Wind, Made by Author (2025)

To clarify the diagram, local authorities are not opposition groups themselves, but they can be under pressure from individuals and opposition groups.

The various tools presented in this section extend the possibility for non-state or established actors to take part in the regulation of the energy sector. As this section has demonstrated, the energy transition opened new avenues for local authorities and non-governmental actors to exert influence over the energy sector, yet without dethroning the State and EDF as dominant regulatory powers. Rather, new tools have given the CRE, state services, and EDF considerable power over the pace and scope of renewable energy integration, thereby maintaining the electricity sector's institutional dependency. Yet, intermittent energy's land requirements have given opportunities for local actors, including the ASSAUPAMAR and residents, to influence the trajectory of the energy transitions by using these new tools to

promote or constrain intermittent projects. The diagram below summarizes the overall resource access structure of wind and solar in Martinique, including who has access to the market and its revenues and who regulates access.

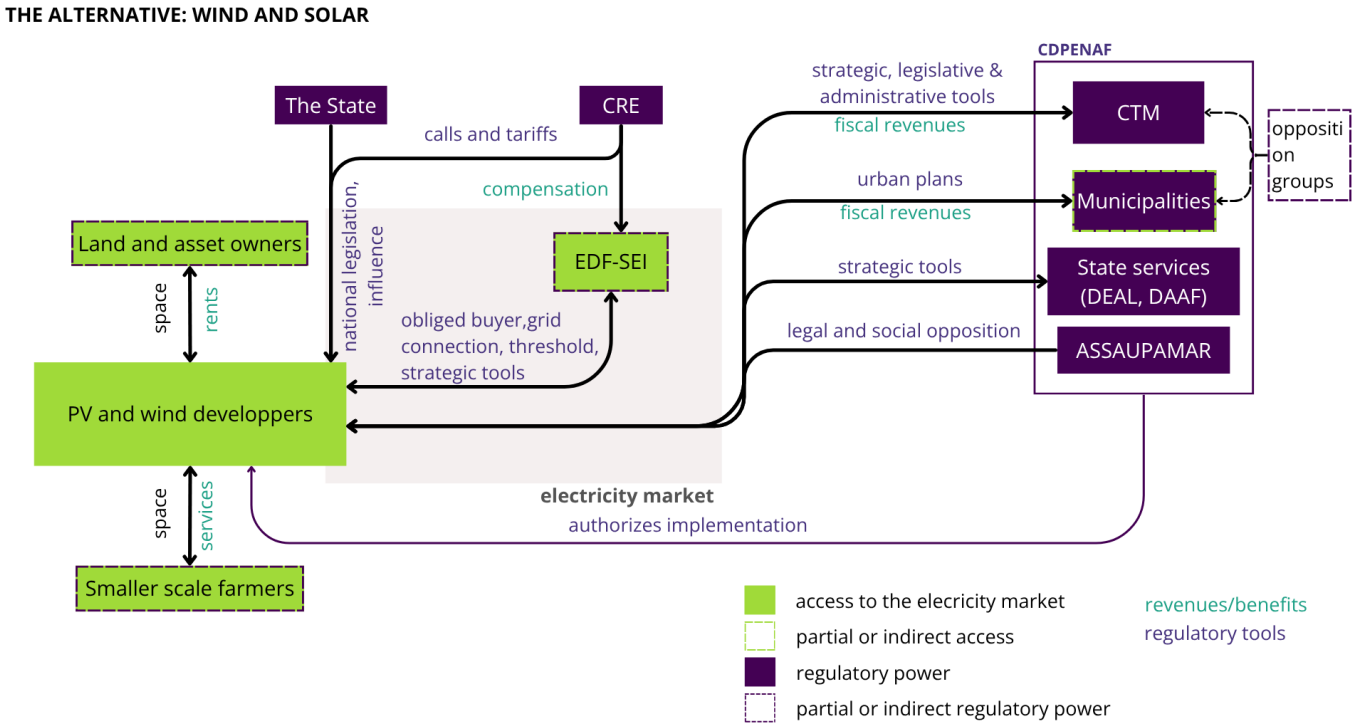


Figure 13 The Resource Access Structure of Wind and Solar, Made by Author (2025)

Beyond giving power to new actors and creating new revenue streams, by linking land to the electricity sector, wind and solar projects have positioned land politics at the center of the debate, and with it criticism of the territorial order. The next section outlines how land politics has entered the energy debate.

7.3.3 Under Which Conditions?

Across governance struggles over wind and solar, three territorial questions are being negotiated: what should the land be used for (and should it be used at all), who should be able to derive benefits from it, and who gets to control it.

7.3.3.1. Land Use: Material and Ontological Struggles

Actors evaluate the adequacy of renewable energy projects based on their impact on land use, particularly in relation to agricultural usage. As such, wind and solar are treated differently, given that wind turbines do not fundamentally repurpose existing land usage. For traditionally opposing parties (agricultural services and the ASSAUPAMAR), wind therefore poses a lesser concern but is nonetheless evaluated in terms of its impact on agriculture and the natural environment. For the state agricultural services, wind parks can still create an issue for the agricultural sector, depending on how land tenure contracts are negotiated. Using the example of GRESS, this civil servant reports the following:

> "We discovered that for GRESS, the petitioner (*energy developer*) asked to subdivide the agricultural land so that the footprint of wind turbines could be sold back to him. (…) That's a problem. He subdivides his land, meaning that for each installation of a wind turbine, there is a kind of footprint created around it. Right, so he buys back the surrounding parcel. That's a problem because it clearly diverts the land from its intended use. And on top of that, it's land of excellent quality. In fact, it's among the best land in Martinique, so that's a problem. There's a financial aspect and a compensation that goes to agriculture. But here we're not talking about private interests, we're talking about the general interest. We are taking away part of Martinique's production capacity. We are defending not only the farmer but agriculture in general." (IntMA42, civil servant, DAAF).

As this quote illustrates, despite the lack of significant land use change generated by wind activities, the integrity of agricultural land is fundamental to evaluating wind projects.

Even more than for wind, concerns over land use change are central to PV development. The production of electricity from local renewables, while contributing to energy autonomy, enters into competition with another form of dependency inherited from the agricultural sector: food dependency. Interview participants oppose ground-mounted PV because of its consumption of 'good agricultural land', preventing Martinique's efforts towards food autonomy. Even though PV parks were sited on land used for agricultural production not contributing to food autonomy, it is still considered a loss of potential, a degradation of the land which *could be used to* grow food for the local market. For example, I asked an interviewee about the

relevance of opposing PV projects on the grounds of food autonomy, if they would anyway replace a production oriented for the export market. This interviewee, having long worked on Martinique's energy transition and mindful of the island's broader issues, reacted in the following way:

> "Your question is a bad question. I don't agree with it, because then someone can say: because I used to export, I might just as well produce energy, right? I can produce for myself. It's still good agricultural land that's being taken. […] It's really about changing the purpose of the land, isn't it? If it's good land that produces, there's no reason to do anything else with it." (IntMA7, employee, SMEM)

The solution of PV developers has been to promote PV infrastructures compatible with agriculture. Yet, these projects are met with vigilance by agricultural regulators and the ASSAUPAMAR. These infrastructures should be supported by a serious agricultural project and tailored to the farmer's needs. As such, for these actors, agricultural activities are largely preferred over the production of electricity. PV developers and energy policymakers consider the protection of agricultural and natural land overly restrictive. They call for a relaxation of existing regulations based on the productive value of the land, differentiating between productive, pristine land and underused or degraded lands.

> "I think it would be necessary to adapt according to the areas, according also to the agricultural potential of the territory. Because not all land, even if classified as agricultural zones, there may be that have greater potential than others." **(**IntMA1, Energy and Climate officer, DEAL)

Such statements are in line with the land use requirements set by the energy regulatory commission (CRE), which allows for the development of ground-mounted PV outside of urban zones only when the site is 'degraded' or 'with lower land-use stakes' (CRE 2019; 2024). These types of sites have been favored by the project winners of the CRE, namely the new park of the *Coulée Blanche* which takes place in proximity of an old quarry, the park of Mignot sited over a water body contaminated by the Chlordecone pesticide or the park of Le Francois, planned over a municipal landfill. Yet, what counts as degraded, urban, agricultural or natural is not neutral, they are an administrative description aimed at delimiting land

between productive or unproductive areas. This classification may contrast with other perspectives and may not appear ‘degraded’ or prone to urbanization. Rather, these projects often take place in areas that could be categorized as ‘green’ or ‘natural’, while not being classified as such. Images from satellite imagery and site visits grasp the difficult interpretation of the ‘true character’ of an area. The images presented below represent the site Cheval Blanc in Bellefontaine, whose ‘urbanized’ classification contrasts with the wooded landscape.

Picture 11 Satellite Imagery (2020) of the Cheval Blanc Site in Bellefontaine.

Picture 12 Satellite Imagery (2023) from the Cheval Blanc site in Bellefontaine after Wood-clearing

Picture 13 Cheval Blanc Site, Taken by Author (2023)

In the two cases brought to court, the ASSAUPAMAR denounces the contradiction between local urbanistic plans and the 'real' quality of these areas, which may not be classified as natural but are nonetheless wooded or green areas. About the case of Bellefontaine, the members interviewed explain the following:

> *Interview participant 1:* "The project was to put 8 hectares of ground-mounted photovoltaic panels on a wooded area but buildable because the PLU said that the zone was intended for the extension of urbanization."
>
> *Interview participant 2:* So one of the problems we are facing, I strongly denounce this, *(is that)* the administration, the mayor says: there it's a buildable zone, there it's natural, there it's to be urbanized...
>
> *Interview participant 1:* No but look, it's a forested zone! But since they wrote urban zone, well, then we act as if there were no more forests. Reality against a purely administrative decision.
>
> *Author:* So the town hall has a lot of power to decide what goes into an urbanized zone or not.
>
> *Interview participant 2:* It's the reification of the world, the description, the objectification of the world, where the description of the world takes over the reality of the world." (IntMA36, ASSAUPAMAR)

The struggle over land use takes here an ontological character as the ASSAUPAMAR's ecological understanding of nature is confronted with utilitarian philosophies, embodied by the CRE and public administration. Therefore, the implementation of renewable energy infrastructure raises problems of material and ontological nature; what the land should be used for, whether it should be used at all and how to define the land in the first place.

7.3.3.2. Distribution and Power: Who Should Derive Benefits From the Land, and Who Gets to Decide?

The alliance between renewable energy developers and large landowners raised concerns over the distribution of benefits generated by such infrastructures. Concerns over food autonomy are then intertwined with the beneficiaries of PV parks denounced as 'large landowners', companies or 'big groups' whose motivations are perceived as purely financial and fail to contribute to local development. As coined by this member of the ASSAUPAMAR:

> "Those who benefit the most from renewable energy are the big groups who can afford to pay the entry ticket which is relatively high. There are windfall gains for those who are already owners and who can own more efficiently. I mean when one has land, when one has a building on which one can put a roof, well one can optimize one's assets and so once again there is a bonus for the one who already owns (…) it's big operators who will come from outside with money, EDF énergie renouvelables or others, that are able to set up big projects. And then our local benefit is to be less intoxicated by combustion that produces harmful effects for the immediate environment or for the planetary environment. But from an economic point of view, it's not at all redistributive." (IntMA36, ASSAUPAMAR)

Distributive concerns are also at the root of the local contestations of wind parks in the north of the island, where residents denounced the lack of benefits they derived from the first park. While contestation started over logistical issues over the transportation of the wind turbines, residents interviewed deplored the unfairness of the project, contrasting the perceived revenues generated by energy developers and landowners with the lack of benefits for the local population affected by the transport. The transportation of the wind turbines indeed poses a considerable issue for the inhabitants of Grand'Rivière, who are connected to the rest

of Martinique only thanks to one road and two historic bridges. This raised concerns over the stability of the bridges and the inhabitants' access to basic services outside of the village.

Picture 14 Limited Access to the Village of Grand'Rivière, Taken by Author (2023).

Opposition is also connected to the land ownership of agricultural land sited for renewables, which benefits large landowners. Agricultural landownership being associated with the colonial history of plantations and landowning *Békés*, PV and wind development in Martinique is not only an alliance between corporate and large landowners' interest but also a continuation of the wealth accumulation enabled by the persistence of socio-racial inequalities surrounding land ownership. While the term 'Békés' is rarely used by project opponents or critics, who prefer to use the term 'large landowners' or 'big families', the term itself was used by energy policy makers or developers to explain local contestations. For example, to explain ASSAUPAMAR's opposition to some projects, this interviewee working on enegry governance for several years for a State agency, views the ASSAUPAMAR as an association that is primarily "political, anti-colonialist, and so on, so sometimes they oppose projects, but that are linked, I don't know, to the landowner on which it is going to be developed because it's a *Béké* or I don't know what." (IntMA12, energy governance)

In interviews with critics or direct opponents to renewable energy installations, large companies and historical landowners are seen as profiting at the expense of the local population. A historical pattern denounced by this leftist political figure, here commenting on the GRESS wind parks in the very North of the island, a more rural and relatively less developed region of Martinique:

> "We are in an extractivist model (…) which comes from the underdevelopment of this zone *(the North-Atlantic coast)*, where there was a strong establishment of bananas as an export speculation. I'm not going to go back over the consequences and the reality of that territory, but today it's the same ones who are behind these projects, the 'de Lucy'[82] and company. So the lobbies that we know, they are the same ones who are going to carry projects and multiple wind farm projects on the same area to sell energy" (IntMA46, Member of the Parliament).

Beyond the uneven distribution of benefits, local discontent is also rooted in the lack of local decision-making power that citizens and local authorities have over the conditions of the implementation and transport of the wind turbines. As this resident from Grand Rivière explains:

> "Foreign companies that are 8000 km away and come to install wind turbines here that maybe are not suitable for Martinique (…) they also impose on us the way to install them and the way to transport them and everything. And when we see the benefits for the locality, they are really minimal." (IntMA2, resident of Grand Rivière)

As illustrated by this quote, the external origin of the actors involved and support provided at the national level exacerbates feelings of powerlessness in the face of 'decisions made in Paris' removed from local concerns, through the alliance of corporate and State interests.[83] The linkages between the project parties and the State explain the perception of wind projects as being 'pushed by the State', in particular concerning the first wind park given the involvement of the former overseas minister in NW Energy group, the energy developer.[84]

Renewable energy development has therefore been criticized and contested for reproducing existing resource access structures through the alliance of corporate landowners and state-

[82]Name of the landowner, 'the prefix 'de' in French signals the history of nobility and in the case of Martinique, an association with the *Béké* class.
[83] IntMA2- resident of Grand Rivière
[84] IntMA21-regional authority (CTM)

level interests. Land politics; the usage of the land, its definition and distributive outcomes are therefore at the heart of negotiation over wind and solar projects and go beyond the question of the energy transition to question the resource access structure of Martinique in general.

7.4. Discussion: Questioning the Territorial Order Through Land Politics

This chapter explored the impact of intermittent renewable energy on who has access to revenues from the electricity market and who holds regulatory power. The revenue streams and regulatory power capacities of this new electricity market are represented in the diagram below.

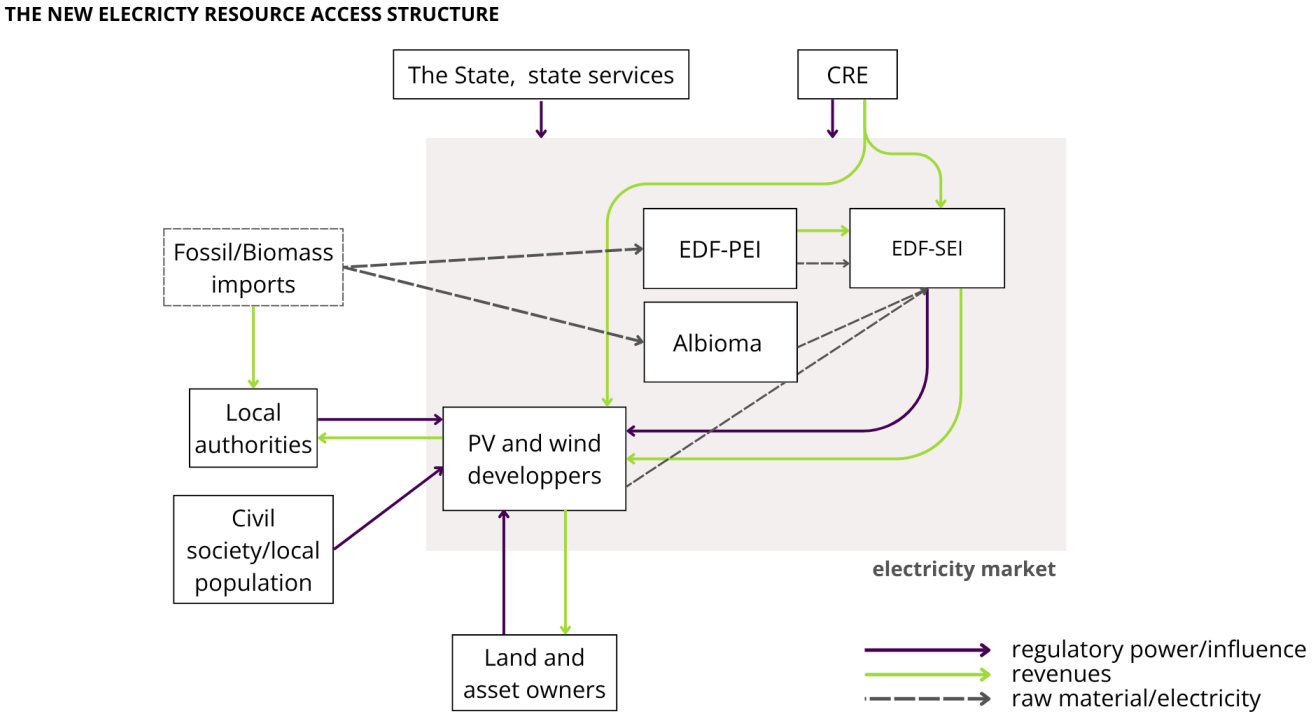


Figure 14 The New Electricity Resource Access Structure, Made by Author (2025)

The **access to revenues** from the electricity market has been broadened to new actors, namely asset owners and farmers. Yet, wind and solar infrastructures are dominated by very few actors, among which are subsidiaries of Albioma and EDF, who, through intermittent energy,

secure their market position. Intermittent energy, therefore, only marginally challenges the structure of the electricity market, which is still dependent on a few actors.

In addition, by principally benefiting existing asset owners, intermittent energy maintains colonial structures of wealth distribution and the existing logic of land use. Converting agricultural plantations into 'energy plantations' perpetuates a system in which a few actors control disproportionate shares of the land and the use they make of it. While this may reduce the material dependency of the electricity sector, it does little to alleviate the island's food dependency or the broader structures of power that shape resource access. These dynamics help explain the pushback against renewable energy projects in Martinique. This has forced solar developers to seek partnerships with smaller farmers, who are more accommodating of the low-rent incentives they can now afford to offer.

From a decision-making perspective, the energy transition has cemented the power of the State, EDF and of the CRE over the electricity sector. Auction calls fundamentally structure the development of renewables in the island. Therefore, the institutional dependencies of the electricity sector upon state-level actors remain strong. Nonetheless, the space requirements of solar and wind projects have also opened regulatory opportunities for local actors, who are not confined to formal energy transition tools but can also exert influence through land-based administrative measures or local protests. Local contestations, although rarer since 2013, contribute to creating pressures on political actors, who, as in the case of GRESS 2&3, take regulatory actions to constrain the development of projects. The use of these unofficial tools shows the power that local actors can nonetheless yield despite a structurally constrained environment.

Intermittent energy's land requirement has been crucial to shaping this new electricity sector. It is through securing land that renewable energy actors enter the market, through land that new actors can access its revenues and again through land that intermittent energy is

regulated. As such, wind and solar have brought land politics to the center of the energy debate. This debate includes questions over the appropriate use of the land, the distribution of benefits and the very definition of land and resources. While land politics have impacted the pace of wind and solar development, it has also contributed to democratizing the electricity system by opening discussions about those who benefit from Martinique's resources and, by extension, its territoriality.

Yet, while crucial to ensure a structural change away from the incumbent regime, land politics provide a justification for the continuation of the incumbent regime. Albioma's provision of synchronous renewable energy in the form of imported biomass is soon to be complemented with the conversion of EDF's thermal plant to biofuels announced for 2033. This eventually removes land politics from the negotiation over the island's energy future by displacing it to other localities. This aligns with a growing interest in offshore wind energy across overseas territories. The sea being the prerogative of the State, offshore wind removes local actors' regulatory capacities by re-embedding the production of electricity within the territory of the State. Offshore wind is a good example of what Avila-Calero (2025) identifies as the tendency to mold renewable energy to fit the needs of the incumbent system. Such infrastructure essentially works through a high concentration of power capacities which suit centralized management and governance. Therefore, the combination of imported biomass and offshore wind power, by removing land from negotiations, eventually prevents crucial discussion over Martinique's territoriality.

7.5. Conclusion

Intermittent renewable energy has been advocated for its potential to revolutionize the structure of the electricity sector away from top-down governance and concentrated markets. Yet as solar and wind increasingly contribute to electricity production, their contribution to a multi-actor, bottom-up, and distributive electricity sector remains to be proven. While these

technologies suggest the potential for more distributed forms of energy governance, in practice, their integration maintains established dynamics.

This chapter has examined how the development of wind and solar energy interacts with Martinique's resource access structure: who has access to the market and its revenues, and who controls access. The incumbent electricity sector of Martinique is centralized and concentrated, characterized by the preeminent role of the State, EDF, and, gradually, Albioma. The opening of the industry to wind and solar has not substantially changed the electricity system. The findings show that access to the electricity market and its revenues has only partially opened to new economic actors and favored partnerships between large energy companies, established actors, and asset owners. Wind and solar only marginally benefit local authorities and reinforce colonial structures of wealth distribution through rents paid to large landowners. These structures mimic what Stock (2023) refers to as 'energy plantations', monocultural usages of the land reflecting colonial and capitalist logics.

Yet, this model has been contested locally, leading energy developers to seek new alliances with smaller farmers and alternative infrastructures. This contestation has mainly taken place through changes in regulatory power made possible by the land requirements of wind and solar. Local actors have used land-based planning tools and regulatory mechanisms to shape, promote, or prevent projects. Regulatory bodies, professional associations, the ASSAUPAMAR, and residents influence the trajectory of the energy transition by participating in land use commissions, influencing local urban plans, undertaking court proceedings, or contesting projects directly. Nonetheless, the State power has also solidified through the continued role of EDF over energy planning and the centralization of calls for tenders and tariffs, essentially controlling the energy transition in Martinique from a distance.

The negotiation over the implementation of wind and solar infrastructures interrogates how land and its resources should be used, whether it should be used at all, and who should benefit

from the island's resources. At the center of these discussions are concerns over the loss of agricultural land and food autonomy, but also ontological struggles concerning the nature of land and resources. In addition, through renewable energy projects, actors re-negotiate who should benefit from the land and its resources and who is legitimate to decide over such questions.

The findings of this chapter suggest that while intermittent renewables do not redistribute power structures, they provide an avenue to debate existing territorial arrangements. The politicization of the resource use structure is inherently linked to the land requirements of solar and wind energy. The current strategy of the island to pursue imported biomass and offshore wind, by removing land, has two consequences. First, it molds renewable energy to fit the existing electricity system, favoring the centrality of the State and of the EDF-Albioma model. Second, by removing land and therefore land politics, it eventually prevents crucial discussion over Martinique's territoriality. As such, following Avila-Calero (2025), it molds the energy transition to accommodate the needs of the existing system.

These findings shed light on the research questions addressed in the dissertation. Local renewable infrastructures can challenge structural dependencies in the agricultural and electricity sectors, yet the current model of renewable energy development does little to overturn entrenched institutional, sectoral, and material dependencies. Similarly, the implementation of wind and solar in Martinique can alter land use patterns while leaving the distribution of benefits largely unchanged. The next chapter brings these findings together with those of previous chapters to discuss the current energy trajectory of Martinique and Reunion.

Part IV: Discussion and Conclusion

8. Discussion

This dissertation has investigated the territorial implications of energy autonomy through the cases of Martinique and Reunion. The findings from the case studies show how an energy transition based on locally available renewable resources (i.e, energy autonomy) challenges the territorial forms inherited from the plantation. In doing so, it demonstrates how the alternative trajectory based on imported biomass (i.e., energy dependency) keeps them in place. Moreover, they contribute to a better understanding of the territorial dynamics of energy autonomy across scales. Accordingly, this chapter is divided into three sections. It begins by discussing the findings and their implications for Martinique and Reunion. Thereafter, the chapter conceptualizes the territorial dimensions of energy autonomy beyond the case studies. Finally, this chapter outlines the dissertation's broader contributions, its limitations, and avenues for further research.

8.1. From Imagined Transitions to Reality

8.1.1 The Territorial Implications of Energy Autonomy in Martinique and Reunion: Answering the Research Questions

To examine the territorial impact of energy autonomy, Chapter 4 characterized Martinique and Reunion's territoriality as one still marked by the plantation system. Chapter 5 examined the imaginaries that underlie the energy transition discourse, the reality they make possible or the ones they prevent. Chapters 6 and 7 looked more closely at the internal processes that affect the implementation of renewable energy and how it intersects with local land uses and beneficiaries. Throughout the chapters, I have highlighted how the pursuit of energy

autonomy ultimately affects the core territorial dimensions of these islands: their continuous relationship of dependency upon external and industrial powers (i.e., the state, EDF) and the unequal, monocultural use of the land and its resources. This section brings together the findings from the chapters to answer the research questions posed at the beginning of the dissertation.

8.1.1.1. How do imaginaries of the energy transition enable the reconfiguration of the territoriality of Martinique and Reunion?

This research question investigates the ideas and ambitions guiding the energy transition. It seeks to understand how these ideas influence its trajectory and ability to initiate territorial change. In the case at hand, the imaginaries of the energy transition (Chapter 5) give rise to two alternative territorial projects that envision what the energy transition should accomplish.

The 'laboratory island project' portrays the energy transition as a way to turn Martinique and Reunion into testing grounds for energy technologies. This project is in continuity with the existing territoriality of Martinique and Reunion, by reclaiming their belonging to France and their usability by it. The energy transition trajectory supported by this project relies much more on developing innovative technologies than on reducing the electricity sector's dependencies. As such, it does not propose a profound reconfiguration of Martinique and Reunion's territoriality. In contrast, for 'the autonomous island' project reaching energy autonomy is crucial. Local renewables are seen as a way to reduce financial transfers from France, to achieve greater decision-making power over the energy sector, and to open it to more actors. It therefore implies a reduction of the key axis of dependencies characterizing the electricity sector (material, financial, sectoral and institutional as explored in Chapter 4). Therefore, this vision contributes to reshaping the territoriality of Martinique and Reunion away from the relationship of dependencies that prevents these islands from being truly self-reliant. As such, it directly questions the position of these islands within France.

While the autonomous island project opens the possibility of territorial change it also sets its limits. By neglecting the consumption patterns that underpin energy dependency, it fails to challenge the foundations of the energy system and the socio-economic order that sustains it. Therefore, the transformative potential of the autonomous island project remains confined to the existing developmentalist paradigm and depends primarily on developing local renewable energy capacity. Yet, local renewable resources have so far failed to make a substantial contribution to the electricity mix of Martinique and Reunion.

8.1.1.2. How does the pursuit of energy autonomy interact with existing land use and beneficiaries?

This question looks at the development of renewable energy capacities at the island level. In Reunion, the organization of agricultural land around the sugar cane industry means that PV and agrivoltaics infrastructures confront existing land use and the interests of the sugar cane industry. Agrivoltaics implementation, therefore, relies on the unmaking of the previous order of land use (sugar cane), to implement a new one (alternative agricultural commodities, electricity). As this new order is debated, actors also negotiate what the land should be used for and ultimately, to whose benefit.

In Martinique, the implementation of solar and wind has generally benefited those who could already extract value from the land. Capacity-scale wind and solar installations have primarily been developed on agricultural land owned by historic landowners. Therefore, similarly to Reunion, the integration of renewable energy on agricultural land entails new uses of the land (from agriculture to energy). However, this approach does not redistribute who benefits from it, as historical landowners are still able to capitalize on their land by producing energy instead of (or next to) their agricultural production. This model of solar and wind development has faced opposition from local governance, agricultural bodies, and the civil society organization ASSAUPAMAR. The question here is not just what the land should be

used for (agriculture, food production, energy) but also whether it should be 'used' at all, according to whose terms, and for whose benefit. This has forced energy developers to present new models of wind and solar implementation, which steer clear of the large-scale development of renewables on the land of historic landowners. This is enabled by the land requirements of solar and wind, which opens the possibility for new actors to shape the energy transition as they gain access to official and non-official land-based regulatory tools.

Together, the findings demonstrate that land politics influence the integration of local renewable energy in Martinique and Reunion. It does so by bringing in a range of territorial issues within the energy transition debate: what should the land be used for, who should benefit from it, and who should decide over it. While land politics delays and complicates the integration of local renewable capacities, it also presents an opportunity to discuss existing territorial arrangements that extend beyond the electricity sector. This includes legacies from the plantations such as the unequal distribution of resources, the power of the state and external actors or the persistence of sectoral dependencies on export-crops.

8.1.1.3. How are Martinique and Reunion's structural dependencies impacted by the pursuit of energy autonomy?

This question explores the interconnection between the deployment of local renewable capacities on the inter-territorial relations of Martinique and Reunion, characterized by a range of dependencies. The findings show that energy autonomy has the potential to affect the structural dependencies that affect the electricity sector and is envisioned as such (Chapter 5). Indeed, the production of local renewables could not only reduce the material dependency of the electricity sector but could also open electricity generation to more actors (sectoral dependency), enable greater local control over the electricity market (institutional dependency), and decrease the cost of electricity generation (financial dependency). In practice, the development of local renewables challenges or reconfigures some of these

dependencies, but without completely altering them. The development of local renewables still largely depends on the power of state-level actors and on existing industrial and economic players in the electricity and agricultural sectors.

From a sectoral perspective, Chapter 7 has shown that despite the coming of new actors into the electricity market, existing players such as Albioma and EDF remain key actors of a concentrated market. Moreover, the development of local renewables still actively depends on the power of the State and its agencies. The imaginaries of the energy transition are partly generated by state-level actors and national media (Chapter 5). In addition, national legislations, auction calls delivered by the CRE, and EDF's advisory role over the energy transition further cement the power of the State over the direction of the energy transition in Martinique and Reunion (Chapters 6 and 7). Yet, the deployment of local renewable capacities has also opened room for greater local decision-making. Both the implementation of agrivoltaics in Reunion and the experience with intermittent energy in Martinique show that local actors gain local decision-making power through their ability to block or shape land-based projects. Finally, given the complexity of variables involved and the lack of data available, the impact of energy autonomy on the financial dependencies that characterize the electricity sector remains unclear. While it is argued that electricity production would be cheaper when based on local renewables, the extent to which this would affect public spending and other financial variables remains unclear.

The structure of the agricultural sector and its dependencies on a few crops, actors and industries also considerably shape the implementation of renewables in both islands. In Reunion, agrivoltaics may provide an opportunity to reduce the dependencies upon the sugar cane sector (Chapter 6). While in Martinique, the conversion of agricultural plantations into “energy plantations” maintains a system in which a small number of actors continue to control disproportionate shares of land and determine its uses. In both cases, the deployment of land-

based renewables is seen as an additional pressure on food dependency, itself induced by the persistence of the territoriality of the plantation. Therefore, the impact of energy autonomy on the structural dependencies of Martinique and Reunion depends on the interconnections between the electricity and the agricultural sectors and on the model of renewable energy development: where it is implemented, instead of what and to whose benefit.

8.1.1.4. How does the pursuit of energy autonomy ultimately impact the territoriality of Martinique and Reunion?

Given the answer to the previous three research questions, the dissertation argues that whether the energy transition achieves greater levels of energy autonomy, or in contrast, pursues decarbonization without autonomy, has different territorial implications. Energy autonomy, through the development of local renewables such as wind and solar, challenges the territoriality of the plantation. It does so by implying a diminution of the various forms of dependency constraining these islands and by questioning the organization of the land. This is not to say that solar and wind development entirely undermines dependency relationships or unequal land use and access. The State still holds considerable power over the development of solar and wind. In Martinique, these technologies have also recreated wealth accumulation patterns inherited from the plantation. Nonetheless, precisely because they depend on land, local renewables open the electricity market to new actors and provide new avenues to negotiate the legitimacy of existing land use and beneficiaries. As such, energy autonomy *challenges* but does not erase the territoriality of the plantation.

Conversely, the energy transition trajectory based on imported biomass *maintains* dependency structures through the continuation of an import-based electricity system, and with it the territoriality of the plantation. It does so by entrenching Martinique and Reunion in a continued state of dependency, whereby their electricity sector depends on imported resources, financial transfers from France, a duopolistic market structure (EDF-Albioma), and

the State's control over energy affairs. Therefore, a transition largely based on imported biomass replicates the historic structure of the electricity system, based on material, financial, sectoral, and institutional forms of dependency. Moreover, the reliance on imported resources removes land politics from the electricity debate, depoliticizing the energy transition, and preventing territorial debates over the use and beneficiaries of the land and its resources. This, therefore, removes one avenue to discuss the unequal distribution of land or its continuous monopolization for the production of colonial crops, which contributes to food dependency. The figure below summarizes the impact of these different trajectories on the territoriality of Martinique, as characterized by the legacies of the plantation.

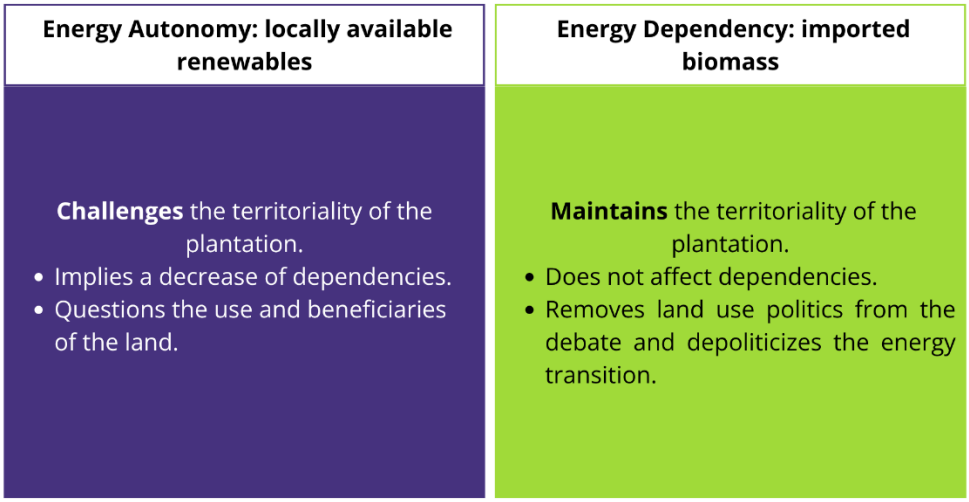


Figure 15 Territorial Implications of Renewable Energy Transition Trajectories, Made by Author (2025)

The land requirements and associated land politics of wind and solar contribute, among other factors, to the slow uptake of these technologies in Martinique and Reunion. Conveniently, they have been presented with another solution to quickly decarbonize their energy mix. This is what I call the 'bio-solution' or the substitution of fossils for biomass *imports* as a way to achieve decarbonization while maintaining the existing power structure. Thanks to the 'bio-solution', the basic structure of the electricity sector remains the same, with EDF, the State, and Albioma at its center, while circumventing the inconvenience and political discussion that

accompany land-based renewables such as solar and wind. Based on this analysis, the dissertation argues that Martinique and Reunion's energy transition is currently moving toward dependency rather than autonomy partly because energy autonomy challenges the existing territoriality of the plantation, making the bio-solution an appealing option.

8.1.2 Facing Reality: What Happened to Energy Autonomy?

8.1.2.1. The Bio-Solution as the Actual Experiment

The bio-solution consists of the parallel actions of two key actors in the electricity sector of overseas regions and ZNIs: EDF and Albioma. These actors are maintaining or even expanding their market position by converting their fossil-based plants to (mainly) imported biomass in Martinique, Reunion, French Guiana, Guadeloupe, and Corsica. Albioma started using biomass in Reunion in 1992 by designing plants attached to sugar refineries, generating electricity by burning bagasse and coal. It later deployed the same solution in Guadeloupe.[85] In 2018, Albioma opened the Galion 2 plant in Martinique, relying on a similar process but operating this time solely on biomass using a bagasse-wood pellet mix. The opening of Galion 2 enabled Albioma to experiment with operating a 100% biomass plant before implementing it in other territories, which are now in the process of converting their coal-bagasse plant to a pellet-bagasse mix. In Reunion, this conversion was successfully achieved in 2024 by relying on the same wood pellet supply chain used for the plant in Martinique.[86] Similarly, the insular branch of EDF, EDF-SEI, has decided to convert all of its oil-based power plants to biofuels by 2033.[87] This process began in Reunion, coinciding with the conversion of Albioma's plants, and will subsequently be rolled out to other territories, including Martinique. As such, Reunion, identified early on as a precursor of the energy transition among overseas regions,

[85] Then Séchilienne-Sidec
[86] Currently from North America. Albioma intends to diversify and regionalize the origin of their pellets.
[87] Mostly based on rapeseed oil, from various origins (France, Germany, Canada, and Australia).

embodies the real laboratory of the energy transition, as the first of them to become a '100% renewable island'.[88]

These conversions contradict the objective of energy autonomy as they substantially rely on imports. While EDF will fully power its plants from imported liquid biomass, Albioma justifies its use of biomass based on its future capacity to harness local sources. Yet, the experience in Martinique shows that finding and processing local biomass for electricity generation is difficult. In interviews and during public consultation workshops, the feasibility of improving the share of local biomass was deemed generally marginal.[89] In the words of an Albioma employee:

> "We told ourselves; there's biomass in Martinique, so we'll aim for 40% local biomass without first conducting proper resource assessments. As I was saying earlier, building a proper supply chain is fieldwork; you need to go on the ground to assess the sites, the suppliers, and so on. Instead, we just said, 'Okay, let's go for 40%, we'll reach it, it should be possible,' and then we realized it was more complicated than expected. (...) By the end of 2022, our supply mix was at a bit less than 10% of local biomass and 90% of pellets…" (IntMA10, Interview, Albioma Galion).

Similarly, current estimates suggest that the biomass potential of Reunion is insufficient to significantly increase the share of local inputs (Région Réunion 2020). This situation denotes the experimental and uncertain nature of developing local biomass production.

At first glance, the bio-solution contrasts with the imagined transition discussed in Chapter 5. Martinique and Reunion have become neither tech-laboratories nor self-reliant islands. Instead, the energy transition is unfolding through the continuation of dependency and the use of established technologies like biomass and, to a lesser extent, wind and solar. More innovative technologies, such as marine energy, have failed to be successfully implemented on the islands. Nonetheless, as EDF and Albioma test and replicate the bio-solution across territories, they use French overseas regions as laboratories for the decarbonization of their

[88] At least in terms of its electricity mix.
[89] Martinique is currently drafting a regional biomass plan, which ought to be released together with the revision of the PPE.

activities. Through the bio-solution, the laboratory project is partially taking place as historic actors test new ways to maintain and reinforce their position. In doing so, Martinique and Reunion are used as experimental grounds, contributing to France's international image and renewable energy target without altering these islands' territoriality.

8.1.2.2. Dependency Forever? Agency for Change

While Reunion and Martinique are heading towards an electricity mix that does not bring them closer to energy autonomy, this switch is not consensual and remains contested at local levels. During the interviews, as well as in local press articles, reports, and social media posts, the bio-solution is criticized. In Martinique, the biomass plant of Albioma was fiercely opposed upon its opening in 2018. In Reunion, where the complete conversion to biomass has just taken place, energy stakeholders that are concerned with this trajectory (energy developers, local energy governance) have stressed that the reliance on biomass should be temporary until local renewable capacities further develop.

In a new report from the French environmental agency in Martinique, scenarios for 2050 integrate the gradual decrease in the use of EDF-Albioma plants, which, in the long run, are expected to cover only peak demand (Ademe Martinique 2025). In Martinique, the next pluriannual energy planning (PPE) is due to be released in 2025 and might include provisions that contradict a complete switch to imported biomass. In Reunion, while the PPE has enacted the bio-solution, the document nonetheless specifies that the plants' conversion to biomass should not be followed by an increase in their capacities and is described as a step before reaching energy autonomy. Moreover, this dissertation has shown that despite formal regulatory power, local actors nonetheless retain some agency over the direction of the energy transition as they negotiate, oppose or protest energy projects through various means. This shows that despite a practical shift away from energy autonomy, the next decade of energy

planning in these territories could still redirect the current trajectory toward reducing dependency and strengthening autonomy in the electricity sector and beyond.

The analysis of the case studies highlights the territorial implications of energy transition trajectories. Through this investigation, I identify the political dimension of energy autonomy ideals and the crucial role that land politics plays in their realization. The following section discusses what can be learned from Martinique and Reunion's energy transition to understand the stakes and implications of energy autonomy in other contexts.

8.2. Energy Autonomy and Territoriality Beyond the Case Studies

Attempts at achieving energy autonomy in Martinique and Reunion reflect territorial struggles taking place across scales. The energy transition of these islands is shaped by their relationship with the State and center-periphery dynamics but not only. At the local scale, energy autonomy is constrained by debates over the optimal use of land and the distribution of benefits that can be derived from it. From the empirical findings, one generalizable statement can be drawn: Energy autonomy is a territorial struggle over 1) the relationship of a periphery with its center and 2) local land politics. Therefore, I argue that beyond the specific case studies analyzed here, energy autonomy generally implies reworking territorial relations within and between places. These occur across several dimensions, as illustrated in the figure below.

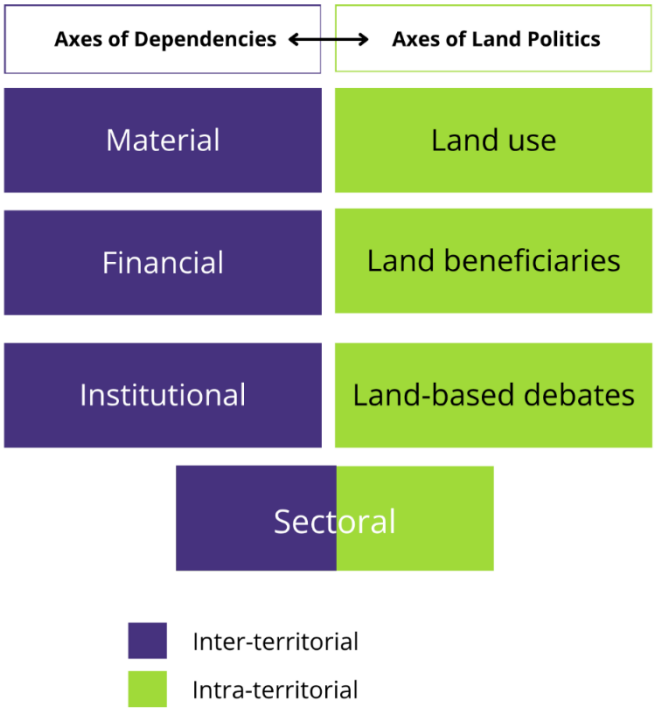


Figure 16 The Territorial Implications of Energy Autonomy, Made by Author (2025)

At the inter-territorial level, energy autonomy affects the relationships of dependency between a periphery and its center. These extend beyond material dependency on material imports and can include financial, institutional, and sectoral forms of dependencies. The table below describes each of these dependency axes.

Table 13 Energy Autonomy: Axes of Dependency

Axes of dependency	Meaning	Examples from the case studies
Material	Reliance on imports for electricity generation, food supply or other material goods.	Fossil and biomass imports. Food dependency.
Financial	Reliance on external funds in the form of subsidies, foreign investments, or debts to finance material supply.	Reliance on the price equalization mechanism and financing from the French energy regulation commission. Subsidized agricultural sector.
Institutional	Lack of decision-making capacities.	Institutional and regulatory power is disproportionately held by the State and its proxies.
Sectoral	Reliance of the sector on a few actors or industries.	Dominance of EDF and Albioma over the electricity market. Over-reliance on export crops.

When energy autonomy relies primarily on land-based renewables, the dependencies of the electricity sector become intertwined with those of the land. At the internal level, the territorial implications of energy autonomy relate to its impacts on existing land use and beneficiaries. Local land politics, including how the land is organized, who owns it, and the debates surrounding its use, are all necessary to assess the implications of energy autonomy.

Table 14 Energy Autonomy: Axes of Land Politics

Axes of land politics	Meaning	Examples from the case studies
Land use	The impact of local energy generation on existing land uses.	Predominance of colonial crops relevant to understanding opposition to PV on agricultural land (protection of a sector, food autonomy concerns).
Land beneficiaries	The losers and winners from the new order of energy generation.	Threatens the dominance of certain industries (Reunion) or reinforces unequal wealth accumulation patterns (Martinique).
Local land-based debates	The legitimacy of different options.	Debates over the right use of the land, food autonomy, and the distribution of resources.

The axes of dependency and land politics described here are not absolute and are open to alterations. In certain situations, some dimensions may not be applicable or have no impact.

In addition, intra-territorial struggles may also take place outside of land-specific issues, over other forms of resource access or decision-making. Nonetheless, these axes highlight the necessity of examining different aspects of energy autonomy beyond the material dimension of energy dependency. The conceptual contribution offered here provides a starting point for determining the political stakes of energy autonomy initiatives in sub-national territories, islands, and other peripheries.

8.3. Continuing the Conversation

8.3.1 Contributions

The dissertation makes several contributions to existing research on the energy transition of the case studies and beyond.

8.3.1.1. Energy Autonomy and the Transformative Power of Energy Transitions

This dissertation contributes to the literature on energy autonomy by conceptualizing it as a fundamentally territorial phenomenon. While existing research often frames energy autonomy primarily in terms of reducing dependency on external powers, my analysis demonstrates that it also reshapes territorial relations within these places. Through the case studies of Martinique and Reunion, I show how energy autonomy intersects not only with questions of sovereignty and state–island relations, but also with the distribution and use of land for renewable energy projects. In doing so, the research shows that energy autonomy entails a reconfiguration of power relations both across territories and within them, rather than merely a technical shift in energy sourcing. The dissertation thus addresses a notable gap in the literature by linking the inter-territorial dimension of energy autonomy (dependency) with its intra-territorial implications (control over land and resources).

By bringing these aspects together, the dissertation offers a new conceptualization of the territorial dimensions of energy autonomy—one that connects land, power, and energy across

scales. This integrated perspective opens avenues to examine the implications of energy autonomy, which may either challenge or reinforce entrenched structures of power, and therefore, its ability to substantially modify the structure of the energy system. These insights align with existing research on the transformative potential of the energy transition: its ability to alter the distribution of power across space (Bridge 2018; Burke and Stephens 2018; Avila-Calero 2025). The investigation of energy autonomy shows that energy transitions are deeply political, and so are the different trajectories that they take. The implementation of local renewable energy capacities in Martinique and Reunion is insufficient to overturn the existing power structure. Rather, it appears that renewables in themselves are not transformative; they are only tools for change.

8.3.1.2. Energy Transitions in French Overseas Regions

Despite their ambitious energy transition objectives and their identification as special places for the energy transition, Martinique and Reunion's transitions have been the focus of limited research. Except for the work of Rivière and Ducastel (2024) and Crézé (2024), respectively on Guadeloupe and French Guiana, the political aspects of the energy transition in overseas regions have not been addressed. I contribute to this literature by critically analyzing the implications of energy autonomy and the integration of renewables upon territorial structures of power. As such, I extend existing research by connecting land use constraints and the inherited structure of the fossil-based sector with the persistence of territorial struggles over who and how these islands are controlled. Energy autonomy in places like Martinique and Reunion, which have struggled to define their relationship with France, cannot be seen in isolation from their history of colonization. The same applies to land-based struggles, which take place over a land still marked by plantations. By linking these elements, the dissertation interrogates the broader role that the energy transition can play in achieving other objectives beyond climate change mitigation and thus provides an explanation for the current energy

trajectory of these islands. In other words, the dissertation identifies what is at stake in the energy transition of Martinique and Reunion.

By examining two case studies, the dissertation reveals common patterns that emerge across overseas territories, including the replication of a common solution for the decarbonization of electricity. This approach highlights the multiple territorial dimensions of the transition across these locations. In Reunion, this meant emphasizing the development of agrivoltaics and focusing on struggles over legitimate land uses. The analysis also revealed Reunion's predominant role in the energy transition discourse as a place where the idea of energy autonomy was first developed and then diffused to other territories, including Martinique. The study of Martinique enabled the focus on the distributional aspect of energy autonomy, of who benefits and has access to resources, key questions in the island's current political landscape. Together, the analysis of these two cases highlights different dimensions of the territorial implications of the energy transition trajectories in sub-national islands and other peripheries.

8.3.1.3. Islands' Energy Transition Research

Existing research drawing from island studies has established that imaginaries linked to islands shape and influence the trajectory of their energy transition (Harrison and Popke 2018a; Mela 2023; Skjølsvold et al. 2020). These authors identify how, through the energy transition discourse, islands tend to be homogenized as one group and tokenized as experimental grounds for innovation. This stream of literature is useful to debunk some of the preconceptions about islands and their energy transition but says little about why these imaginaries are mobilized in the first place, and which ultimate project they serve. It therefore fails to account for the particularities of islands, not as prime places of technology development, but also as global peripheries. I contribute to existing research by showing how island imaginaries serve to argue for different territorial projects in the context of the energy transition.

8.3.1.4. Agrivoltaics and Renewables on Agricultural Land

Previous research has emphasized the challenges of integrating the energy and agricultural sectors as a key driver of local resistance (Carrausse & Arnauld de Sartre, 2023; Moore et al., 2022). I build on these findings to study how local positions are shaped by the type of agricultural production promoted by agrivoltaics and their perceived effects on the local agricultural sector. By highlighting how agrivoltaics may challenge or reinforce existing agricultural practices, relations, and interests, the analysis underscores the importance of situating agrivoltaics deployment within broader struggles over land use and territorial organization.

The findings also confirm and advance existing arguments that agrivoltaics risk becoming a "techno-fix" when energy and agriculture are artificially linked without addressing the norms and priorities embedded in agricultural land use (Moore et al., 2022). Second, they add to research on local opposition to renewables on agricultural land by focusing on the often-overlooked role of local administrations, who can substantially constrain or enable their development. Finally, the dissertation expands current work that studies oppositions to renewables on agricultural land by linking it to broader territorial struggles that extend beyond the agricultural sector.

8.3.2 Limitations

Despite these contributions, the dissertation has several limitations. First, in terms of the perspectives and relations it has investigated. By focusing predominantly on influential stakeholders in each island, the thesis only marginally incorporates the perspectives of marginalized voices or local citizens. This is particularly true in the case of Reunion, which predominantly focused on the integration of renewables as perceived by influential actors. This is partly because, unlike Martinique, local contestations only take place through administrative and political channels, rather than through protests. In Martinique, the

preeminent role of the civil society association ASSAUPAMAR and the local protests around renewables projects made it easier to identify dissident voices and thus to integrate them within the corpus of data. Nonetheless, the analysis in Chapter 5 strongly relies on the imagined transitions of dominant actors, which may not align with the aspirations of the citizens who do not directly interact over energy topics. This is relevant when considering that political autonomy agendas, when brought to public consultations, are often rejected by the local population. Therefore, energy autonomy may only reflect the aspirations of a small, yet influential, elite. Moreover, the impact of energy autonomy on the territoriality of the plantation has primarily focused on its effects on structural dependencies and the organization of agricultural land. This means that its impacts on socio-racial structures and the 'non-human' were only indirectly explored.

Second, this dissertation has examined the political implications of energy autonomy for these islands at the structural level: concerning their relation to France and their internal organization of resource use. It has not looked at the partisan nature of different positions in more detail. Energy transition projects and alternatives can be cross-partisan, yet local political struggles can also influence the direction of the transition and the uptake of some projects over others. In Martinique, this can be seen with the dropping or acclaiming specific projects after changes in political majorities. In Reunion, this has been observed by the long-term project of creating a tramline along the coastline, only to be abandoned and replaced by a highway by the next party in power. All this to say that partisan struggles also matter to explain the direction of infrastructural projects.

Third, the dissertation focused solely on the electricity sector and mostly addressed the implementation of solar and wind energy. This is because electrification remains the central strategy for decarbonization of the electricity sector locally and worldwide. In addition, wind and solar are key technologies for the development of local renewables in these islands, as

they no longer require testing or exploration. Yet, this focus has limited the investigation of other renewables, such as geothermal energy, or the development of local biomass capacities. In particular, while local biomass is proven to be limited on both islands, sugar cane fields currently used for sugar or rum production could be replaced by varieties cultivated primarily for energy generation. This topic remains marginal, but did come up a few times during the field work, not without contention.[90] Nonetheless, the investigation of the whole biomass value chain could have added to understanding the actors that could benefit or lose from an energy transition based on the production of more local biomass. In addition, the dissertation could not quantify the economic costs of different energy trajectories or assess their effects on the electricity sector's financial dependency. The lack of transparency and data availability, combined with the wide range of variables required to estimate such costs, made this analysis unfeasible.[91]

Finally, the territorial dimensions of energy autonomy developed in this dissertation only provide an initial conceptualization. Other axes of dependencies may very well apply in other cases. Similarly, the internal dynamics may encompasses aspects beyond those related to land politics. Nonetheless, this first conceptualization offers to look at energy autonomy through the variety of territorial relations it reshuffles across scales, beyond purely material aspects.

8.3.3 Further Research

The dissertation contributes to a deeper understanding of the stakes of energy transition in the case studies, as well as the broader implications of energy autonomy agendas. Yet, further research is needed to broaden the scope of the analysis. At the level of the case studies, research on the biomass value chain and other renewable technologies would further enrich

[90] In particular, this topic seems to be more pronounced in Reunion, which given the structure of the agricultural sector, would directly contradict the interest of the sugar industry.

[91] The recent report of the Ademe Martinique (2025) presents an overview of the costs of different energy transition scenarios. This report finds that local renewables would be sufficient to eventually achieve high levels of energy autonomy in “competitively economic conditions,” compared to the current situation. Yet, this analysis excludes the impact of these scenarios on the fiscality of energy.

the understanding of the territorial dynamics attached to the energy transition in these islands. Moreover, it is necessary to conduct an economic analysis of the actual costs of alternative renewable resources and their effect on the financial dependency of the islands. While it is generally claimed that solar or wind technologies would lower the economic dependency on the sector on financial transfers from France as opposed to imported resources, the extent to which this would be the case remains to be proven. Along with an investigation of all financial streams that finance electricity production, such as the local tax of the *Octroi de Mer*, this type of analysis could be conducted across all ZNIs. In addition, further research could broaden the scope of the analysis by investigating local perception of energy autonomy or by focusing on key actors involved in the transition at the national level.

Finally, it would be relevant to replicate such territorial analysis in other sub-national islands or former plantation islands. A comparison between the energy transition of independent island-states and another Ultra-Peripheral Region of the EU could be helpful to refine the territorial implications of energy autonomy developed in this dissertation. In particular, further research could focus on identifying internal territorial dynamics that are not related to land but more broadly to resources. This could be particularly relevant for places where the energy transition would rely on less land-intensive technologies, such as geothermal energy.

9. Conclusion

9.1. In Pursuit of Energy Autonomy: A Summary

The energy transition can be more than a substitution of fossil fuels for renewable resources. It also offers an opportunity to question the very basis of the energy system; who controls it, who benefits from it, and which structures of power it supports. The structure of the new energy system is thus a politically relevant question. Calls for energy democracy or energy community projects point to the deficiencies of the current regime and propose alternatives that rely on its profound reorganization. Along with these agendas, energy autonomy presents an alternative to a global energy system by proposing that certain entities function in relative isolation, producing the energy they consume. While energy autonomy can be conceived in purely technical terms, its pursuit has territorial implications. The relocation of energy production requires finding the available space to produce electricity, by whom, and potentially, instead of what. This affects relations of power embedded in local land use and resource extraction. Moreover, energy autonomy implies a reconfiguration of the political and economic ties linking sub-national entities, islands, and other global peripheries to the central power upon which they are dependent.

Reaching energy autonomy is one of the official objectives of the energy transition of the French islands of Martinique and Reunion. Set to be achieved approximately by 2030, recent decisions to rely on imported biomass potentially hinder this objective. In this dissertation, I have investigated the shift away from energy autonomy as a territorial struggle: a dispute over the control of these islands, their land, and their resources. The dissertation explored how the pursuit of energy autonomy affects Martinique and Reunion's territoriality. In particular, I examined the impact of energy autonomy on territorial characteristics inherited from the plantations, namely structural dependencies and the mobilization of the land to the benefit of a

few actors or industries. I find that energy autonomy challenges the existing territoriality of the plantation, while alternatives based on imported resources serve to maintain it. Nonetheless, the deployment of energy technologies using local resources has so far only *challenged* the existing power structure *without fundamentally transforming it.* The dissertation shows that energy autonomy holds the potential to drive territorial change, but only if it does not replicate the logics of the existing system. How energy projects are implemented, the resources they mobilize, and who they ultimately benefit, eventually determine the transformative power of the energy transition. At the heart of this process is land politics, which influences the impact of renewable energy development and the capacity of local actors to assert control over the terms of the transition.

To analyze these dynamics, I relied on a conceptual framework bringing together territorial theory and concepts from the literature on imaginaries. The territorial lens served to identify the processes through which energy transition trajectories may challenge old structures of control, land uses and beneficiaries of these islands and attempts to establish new ones. Socio-technical and spatial imaginaries complement this framework by identifying the broader ambitions, or territorial projects, attached to the energy transition in these territories and the realities they make possible or prevent.

This theoretical framework was applied to the two case studies, Martinique and Reunion. These islands embody different contemporary expressions of 'plantation islands'. As former French colonies built around a plantation model, they have evolved within the French administrative system, following at times the same path, while at others diverging both in terms of their relationship with France and their internal organization. This extends both to the energy and agricultural systems, characterized by a range of dependencies of material, financial, sectoral or institutional nature.

The research focused on the transition of their respective electricity systems and on the development of infrastructures using available local renewable resources, namely solar and wind. The empirical research was structured around two periods of field research, respectively taking place in Martinique and Reunion throughout 2023. In each location, I conducted interviews with key stakeholders, participated in energy-related events, and visited several energy infrastructures as well as potential sites for future renewable energy development. I also systematically collected policy documents, reports, and news articles related to the energy transition in Martinique and Reunion. This corpus of data was analyzed using thematic analysis, with a particular emphasis on discursive practices used to frame the energy transition and the integration of renewables.

Building on insights from existing research and the theoretical and methodological foundations presented in Part I, the subsequent parts of the dissertation were dedicated to the findings from the empirical research. Part II examined the territorial relationship between the islands and France, and how the energy transition is envisioned to alter that relationship. I identified two main territorial projects advocated through the energy transition discourse. The first one positions the islands as laboratories for French energy innovation, reinforcing their integration and contributing to national prestige and to their image within France. The other emphasizes energy autonomy as a means to reduce dependency, ensure self-reliance, and promote endogenous development independent of the French State. These two territorial projects reflect historical debates over the role and place of these islands with France and have different consequences for the pursuit of energy autonomy: a peripheral ambition to the laboratory project, it is a crucial objective for the materialization of a self-reliant island, severed from dependency relationships.

In Part III, I focused on the implications of the pursuit of energy autonomy at the level of each island and examined how the implementation of land-based local renewables impacts existing

land uses and beneficiaries. I find that local land politics over the right use and distribution of the land plays a fundamental role in determining the uptake of solar and wind in these islands, and with it, the success of energy autonomy. It does so by incorporating a range of territorial questions within the energy transition debate: what should the land be used for, who should benefit from and decide over it? While land politics delays and complicates the integration of local renewable capacities, it is also an opportunity to re-negotiate existing territorial arrangements that extend beyond the electricity sector, including legacies from the territoriality of the plantation.

In Part IV, the dissertation discussed what these findings mean for the territoriality of Martinique and Reunion. Together, the empirical chapters show that the autonomous island imaginary enables the reconfiguration of Martinique and Reunion's territoriality by proposing a vision bent on reducing the structural dependencies of these islands. In practice, the pursuit of energy autonomy challenges the electricity sector's dependencies but fails to completely overcome them as institutional and sectoral power remains centralized. Moreover, energy autonomy also interacts with land-based dependencies, such as food dependency and sectoral dependencies on export crops, and can either reinforce or confront them. While in Martinique, renewable technologies tend to maintain existing power structures and dependencies, in Reunion, they serve to question them. Yet in both cases, as renewable technologies are deployed, they also offer the opportunity for local actors to renegotiate how the land is used and who benefits from it. As such, while the pursuit of energy is not sufficient to overcome the territoriality of the plantation, it effectively challenges it.

From this analysis, two main conclusions can be drawn. First, the dissertation provides an explanation to understand why these islands gradually rely on imported biomass despite energy autonomy objectives: energy autonomy challenges the territoriality of the plantation, and with it, the current organization of the energy system. As such, the conversion to imported

biomass offers a solution to decarbonize Martinique and Reunion's energy mix while maintaining the basic structure of the electricity sector around EDF, the State, and Albioma, and avoiding the land politics that accompany solar and wind development. This is what I call the 'bio-solution', which maintains the territoriality of the plantation by entrenching these islands in a relationship of dependencies and preventing crucial discussions over the use and distribution of the land. By following this path, Martinique and Reunion are actually transformed into laboratories, not of technological development, but of the new strategies through which historic actors are able to maintain their position. The territorial aspects of the energy transition, therefore, provide one explanation for Martinique and Reunion's current shift away from energy autonomy.

Second, the findings show that energy trajectories are the outcome of territorial struggles. In particular, energy autonomy is a territorial process that can impact the control over specific areas and their resources at the external and internal levels. As such, energy autonomy should be studied not only as a technical subject, but as a political proposition reshaping the relation of the periphery with its center and the internal organization of land use and resource extraction. Therefore, in Part IV, I suggest considering energy autonomy along a set of intra- and inter-territorial dimensions. At the inter-territorial level, I identify four axes of dependency challenged by energy autonomy, including but extending beyond the supply of energy. These are material, financial, institutional, and sectoral dependencies. At the internal level, energy autonomy re-locates the production of energy at home, and as such disturbs internal patterns of land use, beneficiaries and the particular dependencies they might generate (e.g. food dependency). I identify three axes of land politics affecting the implementation of land-based renewables: existing land use, land access, and local land-based debates. This conceptual contribution provides a starting point to decipher the territorial and, therefore,

political stakes of energy autonomy initiatives of sub-national territories, islands, and other peripheries.

These findings should be interpreted against the scope of the dissertation, which despite providing an in-depth analysis is limited in a few aspects. The analysis focused on the perspective of a limited number of actors active at the local level able to exert influence over the energy transition process. It also did not directly analyze the impact of energy autonomy on socio-racial structures or on the 'non-human'. Moreover, other sectors and technologies relevant for energy autonomy were not investigated such as the decarbonization of the transport sector or potentially available resources or technologies in the future. Finally, due to a lack of available data, the dissertation was unable to quantify the economic costs of different energy transition alternatives on public spending or local taxation schemes. As such, further research on the topic should consider broadening the scope of analysis by examining different aspects affected by energy autonomy in other contexts and from various perspectives.

Despite these limitations, the dissertation makes several significant contributions to existing research. Two main contributions are particularly important to highlight here. First, the dissertation demonstrates the political stakes of energy transitions in French overseas territories and other sub-national islands as they continue to grapple with the legacies of their colonial histories. Second, it presents a first conceptualization of energy autonomy as a territorial process taking place across scales. In doing so, it bridges a key gap in the literature by conceptually linking inter-territorial (dependency) and intra-territorial (land use and resource control) dimensions of energy autonomy. This conceptualization helps map the impact and transformative power of alternatives to the energy system, such as energy autonomy. In line with this contribution, this dissertation concludes with a reflection on how Martinique, Reunion, and other territories could continue to strive for a truly transformative energy transition.

9.2. Towards a Transformative Energy Transition

This dissertation aligns with existing research that questions the ability of the energy transition to be truly transformative: will it help reinforce existing power structures, contribute to more equal and democratic societies or be a tool for emancipation and decolonization? In Martinique and Reunion, achieving energy autonomy means more than curbing energy dependency. It is a question of political power, inscribed within broader aspirations to regain control over the provision of basic necessities, and, with it, to alter the colonial legacies that continue to shape these islands. As such, energy autonomy becomes a question of sovereignty. It is about being in a position to choose whether or not to gain greater autonomy from France, impossible in a context of dependency. Given the highly political implications of the energy transition and to ensure its transformative potential, this dissertation argues for its re-politicization.

To politicize means to make more visible the stakes of different energy transition trajectories and to debate what the energy transition should serve to accomplish. While visions of what the energy transition should achieve exist (Chapter 5), they have yet to be translated into an official strategy or supported by broad, open debates on the political meaning of the energy transition. Interviewees involved in energy governance often stressed the absence of a collective framework capable of uniting political actors. The regional energy plan (PPE) remains a largely technocratic exercise, co-written with the State and insufficiently forward-looking. An alternative would be to develop a broad regional strategy that defines the objectives of the energy transition in explicitly political terms, clarifying the role it should play in shaping the islands' future. The objectives of such a strategy should also be articulated in relation to other key sectors and their priorities. This includes a broader and more open reflection on the future of the agricultural sector, questioning the persistence of specific industries and the material and financial dependencies they generate (i.e., food dependency,

subsidies). Moreover, while energy efficiency efforts and demand management are part of the existing transition efforts on the islands, these initiatives do not challenge the consumption-based economy that drives energy demand. Therefore, an energy strategy would question the structural reasons for energy dependency and could sketch the premise of a renewed territorial organization.

The development of an integrated strategy at the island level relies on a broader democratization of the debate. Energy transition decisions should encompass various scales of governance, including municipal levels. During fieldwork, local municipalities and inter-municipal authorities complained about their lack of integration regarding energy decisions, even when energy projects are implemented within their jurisdiction. Similarly, residents are only peripherally involved in the energy decisions that concern them. Public consultations on energy projects often have poor attendance, and workshops on the elaboration of the PPE tend to attract mostly technocrats and industry actors. As a result, local authorities and residents are left with only reactive tools to oppose energy projects, instead of being active participants in shaping the transition. Meaningful public engagement is notoriously difficult to achieve in energy projects, not only in Martinique and Reunion. Nonetheless, the stagnating development of local renewables highlights the need for greater reflection on public engagement, one that could support the development of local renewable energy rather than hinder it. Rather than just promoting more public consultation and workshops, providing alternatives at the scale of citizens could provide a way forward.

Building on the success of solar thermal systems, which have been supported by public investment and widely adopted by residents, regional actors could further support residential and community-based solar initiatives, reducing dependency on a few dominant players. Where national frameworks (such as calls for tenders) are poorly adapted to local realities and foster large-scale installations, alternative mechanisms could be developed at the island level

to strengthen local renewable capacities. Support for bottom-up initiatives could favor both the democratization of the energy system and the redistribution of resources.

More broadly, overseas regions could further capitalize on their shared experience to strengthen their bargaining power. Historically, powerful coalitions between these territories have been able to produce significant policy outcomes, as seen during the departmentalization process driven by collective action from political elites across the 'four old colonies'. Similarly, common grievances or dissatisfaction with the current trajectory of the energy transition could be mobilized to exert greater pressure on the State, its agencies, and EDF.

These recommendations are ambitious and would require necessary institutional and infrastructural changes (e.g., grid reinforcement, storage capacities…). Admittedly, the scope for action within the institutional confines of Martinique and Reunion is narrow. The current structures of energy governance offer few possibilities to challenge decisions such as EDF's shift toward imported biomass. Yet, as this dissertation has shown, local actors often find ways to assert their agency and influence local developments. The recommendations provided here were drawn from the insights shared with me during field research, showing that these questions are being reflected upon by actors involved with the energy transition. This critical stance could be further harnessed to foster a deeper, more inclusive reflection on the future of the islands' electricity systems and the political significance of the transition. Only through such reflection can efforts to decarbonize electricity also promote greater self-reliance amid a changing global context and climate.

The call for re-politization of energy transitions extends beyond French overseas regions. The cases of Martinique and Reunion demonstrate that while energy transition presents opportunities for deeper societal change, renewable energy technologies are not inherently transformative. Rather, their potential for change depends on how they are deployed. As such, harnessing the transformative potential of the energy transition requires sustained, open

debate over the kind of societies these new energy systems should serve. Ultimately, energy transitions are political and territorial processes and acknowledging them as such is essential to understanding their broader implications.

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Appendix A: List of Interviews

ID	Sector	Type	Institution/organization	Interviewees (n)
Martinique				
IntMA1	energy	governance	State services for the environment, spatial planning and housing (DEAL), unit for risk, energy and climate	2
IntMA2	other	governance	Anonymous	4
IntMA3	energy	energy developers	Waste to energy project, Valecom	2
IntMA4	energy	energy developers	Anonymous	1
IntMA5	energy	supporting institutions	French development bank	3
IntMA6	agriculture	research	National Research Institute for Agriculture, Food and Environment (INRAE)	1
IntMA7	energy	governance	Intermunicipal authority for electricity (SMEM)	1
IntMA8	energy	grid operation and distribution	Transmission and Distribution operator, EDF Insular System	1
IntMA9	energy	governance	Intermunicipal authority of South Martinique	1
IntMA10	energy	energy developers	Albioma Biomass plant (Galion)	1
IntMA11	other	governance	Municipality of Le Vauclin	1
IntMA12	energy	supporting institutions	French agency for the ecological transition in Martinique (Ademe)	1
IntMA13	energy	energy developers	Anonymous	1
IntMA14	other	governance	Municipality of Macouba	1
IntMA15	other	civil society	Residents'association of Grand' Rivière	1
IntMA16	energy	energy developers	Anonymous	1
IntMA17	agriculture	farmers representation or cooperatives	Union of young farmers	1
IntMA18	energy	grid operation and distribution	Transmission and Distribution operator, EDF Insular System	1
IntMA19	energy	supporting institutions	Local public company supporting renewable energy development, Martinique Energies Nouvelles	1
IntMA20	energy	governance	Intermunicipal authority of Central Martinique	2
IntMA21	energy	governance	Regional authority (CTM), Energy and Ecological Transition Unit	2
IntMA22	energy	governance	Intermunicipal authority of Central Martinique	1
IntMA23	energy	energy developers	Anonymous	2
IntMA24	agriculture	farmers' representation or cooperatives	Agricultural Chamber of Martinique	1

IntMA25	energy	energy developers	Anonymous	1
IntMA26	energy	energy developers	Anonymous	1
IntMA27	agriculture	farmers' representation or cooperatives	Union of young farmers	1
IntMA28	agriculture	farmer	Not applicable	1
IntMA29	other	governance	State services for the environment, spatial planning and housing (DEAL), permitting unit	1
IntMA30	energy	governance	Regional authority (CTM), observatory for the enegry transition	1
IntMA31	agriculture	farmer	Not applicable	1
IntMA32	agriculture	farmer	Not applicable	1
IntMA33	energy	supporting institutions	Local public company supporting renewable energy development, Martinique Energies Nouvelles	1
IntMA34	other	governance	Muncipality of Le Francois	1
IntMA35	other	resident/civil society	Not applicable	1
IntMA36	other	civil society	Association for heritage and environmental protection, ASSAUPAMAR	2
IntMA37	agriculture	farmer	Not applicable	1
IntMA38	other	resident/civil society	Resident of Grand' Rivière	1
IntMA39	agriculture	farmer	Not applicable	1
IntMA40	agriculture	landowner	Landowner wind park GRESS	1
IntMA41	other	resident/civil society	Resident of Grand' Rivière	1
IntMA42	agriculture	governance	State services for Food, Agriculture, and Forestry (DAAF)	2
IntMA43	energy	energy developers	Anonymous	1
IntMA44	other	resident/civil society	Not applicable	1
IntMA45	agriculture	agro-industry	Anonymous	1
IntMA46	other	governance	Not applicable	1
IntMA47	agriculture	agro-industry	Anonymous	1
IntMA48	energy	energy developers	Anonymous	1
IntMA49	energy	energy developers	Anonymous	1

Reunion				
IntRUN1	energy	energy developers	Renewable energy company, Akuo Energy	1
IntRUN2	energy	supporting institutions	French agency for the ecological transition in Martinique (Ademe)	2
IntRUN3	energy	governance	Anonymous	1
IntRUN4	energy	supporting institutions	Regional agency for Energy and Climate, Energies Réunion	3
IntRUN5	agriculture	farmer	Not applicable	1
IntRUN6	energy	energy developers	Renewable energy company, Albioma Solaire	2
IntRUN7	energy	energy developers	Renewable energy company, Corsica Sole	1
IntRUN8	energy	energy developers	Albioma Biomass	1
IntRUN9	agriculture	farmers' representation or cooperatives	Association for the Modernization of Fruit, Vegetable, and Horticultural Production (ARMEFLHOR)	1
IntRUN10	energy	governance	Departmental Council	1
IntRUN11	agriculture	farmers' representation or cooperatives	Anonymous	1
IntRUN12	agriculture	governance	Anonymous	1
IntRUN13	energy	energy developers	Anonymous	1
IntRUN14	agriculture	farmer	Not applicable	1
IntRUN15	agriculture	farmers' representation or cooperatives	Reunion's interprofessional association for meat and milk	1
IntRUN16	energy	governance	Regional Council	1
IntRUN17	agriculture	farmer	Not applicable	1
IntRUN18	energy	supporting institutions	Anonymous	1
IntRUN19	agriculture	farmers' representation or cooperatives	Association for the Modernization of Fruit, Vegetable, and Horticultural Production (ARMEFLHOR)	1
IntRUN20	energy	governance	Intermunicipal authority of North Reunion	1
IntRUN21	other	supporting institutions	Urbanistic Agency of Reunion (AGORAH)	1
IntRUN22	other	civil society	Association for the protection of agricultural land and the environment, Ecologie Réunion	1
IntRUN23	other	civil society	Association promoting energy autonomy and an alternative agriculture in Reunion, Oasis	1
IntRUN24	other	supporting	Regional Agency for	1

		institutions	Development and Internationalization (Nexa)	
IntRUN25	agriculture	farmer	Not applicable	1
IntRUN26	energy	grid operation and distribution	Transmission and Distribution operator, EDF Insular System	1
IntRUN27	energy	energy developers	Union of Solar Energy Professionals in Reunion (Sorun)	1
IntRUN28	other	governance	Municipality of Sainte-Suzanne	
IntRUN29	agriculture	governance	Departmental Council	1
IntRUN30	agriculture	farmers' representation or cooperatives	Agricultural Chamber of Reunion	1
IntRUN31	energy	governance	Anonymous	1
IntRUN32	other	civil society	Reunion Ornithological Society (SEOR)	1
IntRUN33	energy	governance	Municipality of Sainte-Rose	2

Appendix B: Example Interview Guide

Questions	Purpose
• Please introduce yourself and your organization: What is your role within your institution? What is your institution's overall objective and scope of action here in Martinique/Reunion?	• General introduction.
• Is it important (and why) for the island to achieve energy autonomy and/or to integrate renewable energy sources? • How would you assess the progress and direction of the energy transition in recent years? • How do you assess the objective of the 2015 law and its adaptability to the local context? • What do you think should be the region's energy policy?	• Address how the participant frames the energy transition. • Assess the general perception of energy transition objectives and participants' position on the energy transition trajectory. • Identify potential critiques.
• What do you think about the energy autonomy ambition? Does it conflict with other objectives for the region? • Are there synergies and/or trade-offs between food sovereignty and energy autonomy objectives? How has this taken shape in Reunion?	• Further identify perceptions of autonomy. • Relate energy autonomy to other local processes.
• Is Reunion/Martinique a particularly interesting or challenging territory for the development of renewable energy sources?	• Identify framing in relation to the specific context. • Identify points of contention.
• What types of projects/energy sources would be/are best suited to local needs and conditions? Which types are not, and why?	• Assess perceptions of different energy resources.
• Are there certain areas/types of land that should be preserved from renewable energy development? Why?	• Establish potential land use conflicts and arguments for or against energy development.
• How do you assess the development of photovoltaic energy in agricultural areas? What are the advantages and disadvantages?	• Assess the general perception of PV in agricultural land.
• What direction should it take? • Could we imagine more PV in agricultural areas? Under what conditions?	• Assess the available space for the development of this technology and its conditions.
• How do you perceive the development of agrivoltaics on the island?	• Establish the general perception of agrivoltaics.
• What type of infrastructure can be classified as agrivoltaics—what are the criteria? • Can agrivoltaism contribute to food self-sufficiency? • What types of production should be prioritized?	• Identify conditions for implementation • Identify points of contention in the implementation of agrivoltaics.
• How do you perceive the position of other actors on these issues?	• Identify supportive or constraining actors. • Establish the process through which these installations are negotiated.
• What is your position on onshore wind power? How do you assess its development so far?	• Assess the perception of wind technology.

• How do you perceive the conversion of power plants to biomass? • What should be the role of these power plants in the medium to long term?	• Identify perceptions of recent changes in trajectory and arguments used to support those perceptions.
• What is your perception of the role of EDF in the energy transition process? • What about other energy producers on the island?	• Establish relationships between actors. • Identify the role of EDF in energy policy on the island. • Identify other relevant energy developers or stakeholders.
• How do you perceive state actors and their role in the energy governance of the island? • What about the regional and local authorities? • What is your perception of the current Pluriannual Energy Planning (PPE) and its revision process?	• Address the perception of energy governance on the island at multiple levels (state, region, etc.) • Understand the PPE process and perceptions among participants of its general direction.
• Is there anything else you would like to add that you consider important and that we have not covered so far?	• Address other topics that the questions did not foresee.
• Would you recommend that I speak to anyone else or any other organization in the context of this research?	• Find new interview participants.

Disclaimer: This is a sample interview guide. Each guide was slightly adjusted for each interview. For example, when discussing the implementation of a wind farm for local residents, I focused on their specific experiences with the wind farm. Similarly, when interviewing farmers who hosted agrivoltaics setups, I included questions to better understand their motivations and methods. In these interviews, I paid less attention to questions about energy governance.

Appendix C: Consent Forms

Before each interview, I explained to the interviewees the aim of the research, how I would use the data collected during the interview, and their rights as participants. I then asked them to sign a consent form. Participants were given three options regarding anonymity: they could remain fully anonymous, have only the name of their organization mentioned, or be identified by name. The following consent form was used for participants who chose the latter option.

CEU CENTRAL EUROPEAN UNIVERSITY

Information sheet and consent form

Research project title: Energy transition in island environments: Reunion Island

Researcher: Laure-Anne Plumhans, PhD student at Central European University (CEU), Vienna, Austria.

Name of participant:

Participant's organization:

Research objective:

The research project is part of a PhD thesis being conducted at the Central European University in Vienna, Austria. The project focuses on energy transition processes in islands, particularly in Martinique and Réunion. The objective of the research project is to understand how renewable energy transition projects are integrated into the island. To do this, I am conducting a series of interviews with local stakeholders.

General information:

- The interview lasts approximately 1 hour.
- The interview **will be recorded** but will only be used for analysis and **will not be made public.**
- You have the right to **stop the interview** at any time and withdraw from the research, or request access to or modification of your data.
- The content of the interview (transcribed) may be used in academic documents and conferences. Any further use will only take place with your consent.

- The interview **is not anonymous**, which means that the content of the interview may be used with your name and/or **reference to your organization**.

By signing this form, I declare that:

1. I am participating in this project **voluntarily**. I do not expect to receive any benefits or payment for my participation. I understand **that I can withdraw from the** research **project** at any time.
2. I understand that excerpts from the interview may be used as described above;
3. I have read the information sheet and feel sufficiently informed about this research project and my participation in the research.

_____ _____

Signature of participant and date

_____ _____

Signature of researcher and date

Contact

Laure-Anne Plumhansplumhans_laure-anne@phd.ceu.edu

If you have any concerns about this research, you can contact the chair of the CEU Ethics Committee, Simon Rippon (RipponS@ceu.edu).

Appendix D: Site Visits and Events Participation

Martinique		**Reunion**	
Events	**Date**	**Events**	**Date**
Observation, information night, "Developing PV in Martiniquan collectivities", Ademe	16.01.23	Presentation and Q&A, Committee on the Regional Biomass Scheme	26.10.2023
Observation and participation, public workshop, Revision of the pluriannual plan, DEAL & CTM	07.02.23-09.02.23	Observation, visit of agrivoltaics by prospective client	26.09.2023
Observation, presentation and Q&A, "The E-car in Martinique, a false good idea?", ASSAUPAMAR	11.03.23	Observation, meeting between the municipality of Sainte-Suzanne and Sidelec	23.11.2023
Participation, meeting local opposition group to GRESS 2-3	25.03.23		
Participation, public consultation on the PV project of *Pointe Courchet*	27.03.23		
Participation, meeting with students in energy transition technologies	31.03.23		

Site visits		**Site visits**	
Energy production sites		***Energy production sites***	
Guided visit, Galion 2 Biomass power plant	16.03.23/ 13.02.23	Guided visit, Albioma *Bois-Rouge* biomass plant	25.10.2023
Visit, wind park GRESS 1	15.03.23/ 23.02.23	Visit, *Rivière des Galets* PV plant	27.11.2023
Visit, PV park of Ducos	18.03.23	Visit, wind power plant of Sainte-Suzanne	29.11.2023
Visit, site of the planned PV park in Le François	27.03.23	Visit, *La Roseraye* PV plant	1.11.2023
Visit, towns in the vicinity of the wind parks (Grand'Rivière and Macouba)	7 dates	Visit, *Mangassaye* PV plant	1.11.2023
Guided visit, PV park Potiche	28.03.23	Visit, former and prospective wind farm site of Sainte-Rose	1.11.2023
Visit, site of prospective wind farms GRESS 2 and 3	28.03.23	Visit, Takamaka hydroelectric power plant	11.10.2023
Visit, Bellefontaine power plant (outside)	03.04.23		
Visit, site of the prospective PV park in Bellefontaine	03.04.23		
Farms		***Farms***	
Guided visit, farm 1	27.02.23	Guided visit, agrivoltaics 1	14.11.2023
Guided visit, farm 2	10.03.23	Guided visit, agrivoltaics 2	19.09.2023
Guided visit, solar warehouse 1	13.03.23	Guided visit, agrivoltaics 3	18.10.2023
Guided visit, solar warehouse 2	18.03.23	Guided visit, agrivoltaics 4	26.09.2023
Guided visit, agrivoltaics 1	21.03.23	Guided visit, prospective site for agrivoltaics	13.10.2023
Guided visit, agrivoltaics 2	24.03.23		
Guided visit, agrivoltaics 3	29.03.23		

Appendix E: List of Documents Analyzed for Chapter 5

1. Newspaper Article, Reports, Support material, etc

ID	resource type	title	author	author_type	year
cNat1	report	Panorama de l'électricité renouvelable EN ZNI-MER 2022	French Renewable Energy Association (SER)	industry	2022
cNat2	newspaper article	L'île de La Réunion, laboratoire grandeur nature pour la décarbonation de l'électricité	Le Figaro	journalism	2024
cNat3	newspaper article	Centrales converties à la biomasse : l'île de La Réunion, laboratoire de la transition énergétique française ?	Geo	journalism	2024
cNat4	newspaper article	"Des fumées totalement transparentes" : à La Réunion, les centrales électriques passent des énergies fossiles à la matière végétale	France Info	journalism	2024
cNat5	newspaper article	La Réunion, laboratoire des énergies renouvelables	L'usine Nouvelle	journalism	2010
cRUN6	Interview in newspaper	Paul Vergès en marche contre le réchauffement climatique	Linfo.re	journalism	2009
cRUN7	newspaper article	La Réunion laboratoire des énergies nouvelles	Témoignages	journalism	2010
cRUN8	newspaper article	La Réunion, laboratoire d'EDF	Linfo.re	journalism	2010
cRUN9	newspaper article	La Réunion, laboratoire pour les objectifs du Grenelle	France24	journalism	2008
cRUN10	newspaper article	La Réunion s'en remet au vent…	Parallelesud	journalism	2024
cNat11	radio segment	La Réunion, laboratoire des énergies naturelles	France culture	journalism	2008
cNat12	report	Vers l'autonomie énergétique des Zones non Interconnectées (ZNI): Synthèse et analyse comparative globale Edition 2020, élargie aux 6 territoires	French Environment and Energy Management Agency (ADEME)	governance	2021
cNat13	report	Vers l'autonomie énergétique en zone non interconnectée (ZNI) en	French Environment and	governance	2018

		Martinique à l'horizon 2030	Energy Management Agency (ADEME)		
cNat14	blog article	Ile de la Réunion : une vraie autonomie énergétique en question	Techniques de l'ingénieur	journalism	2019
cNat15	newspaper article	La Réunion en quête d'autonomie énergétique	Les Echos	journalism	2011
cNat16	newspaper article	La Réunion vise l'autonomie énergétique	La Croix	journalism	2008
cNat17	newspaper article	La Martinique se dote enfin d'une programmation de l'énergie	Actu environment	journalism	2018
cMA18	debate	Assemblée CTM sur la révision de la PPE (et autres dossiers)	Regional and departmental authority of Martinique (CTM)	governance	2024
cMA19	newspaper article	Quelle autonomie énergétique pour la Martinique à l'orée de 2023 ?	Martinique 1er	journalism	2018
cZNI20	TV show	Transition énergétique, l'horizon 2030 est-il réaliste ? [ZNI-mer et si on bougeait les lignes ?]	La premiere outre-mers	journalism	2024
cZNI21	blog article	Le chemin vers l'autonomie énergétique	Ewag	journalism	2023
cMA22	blog article	ÉNERGIE : QUAND ALBIOMA S'INVITE DANS LES DÉBATS DU CONSEIL NATIONAL DE LA TRANSITION ÉCOLOGIQUE !	Martinique écologie	politics	2018
cNat23	blog article	[Série DOM-TOM] En Martinique, l'accès difficile au foncier freine le développement du solaire	Pv magazine	industry	2021
cMA24	newspaper article	EDF : Bilan et projets…	Antilla Martinique	journalism	2021
cNat25	blog article	La Martinique doit décider de son avenir énergétique	L'energgeek	industry	2018
cMA26	TV show	On En Parle - Autonomie énergétique de la Martinique : les politiques manquent-ils de volonté?	vià ATV	journalism	2022
cMA27	interview	Énergie	France Antilles Martinique	journalism	2016
cMA28	newspaper article	Les premières lois Martinique sur l'énergie	France Antilles Martinique	journalism	2013
cNat29	blog article	La Martinique fait sa loi	Environment magazine	journalism	2014
cMA30	blog article	Une visite ministérielle : pour quoi faire ?	Regional Councilor Daniel Marie-Sainte	politics	2014
cNat31	newspaper article	Martinique : une déclaration d'intention pour une "île durable" signée par Ségolène Royal	RTL	politics	2014
cRUN32	newspaper article	L'aveu sur GERRI	Témoignages	journalism	2011

cRUN33	blog article	SPL Energies : La Réunion, « une vitrine écologique »	Info reunion net	journalism	2014
cNat34	magazine	Le point sur: Le projet Réunion 2030 - GERRI	General Commission for Sustainable Development	governance	2009
cNat35	blog article	Autosuffisance énergétique: Des experts se penchent sur la Réunion 2030	Zinfos974	journalism	2012
cRUN36	presentation	GERRI: Green Energy Revolution Reunion Island	Gerri	governance	2008
cRUN37	brochure	GERRI: Grenelle de l'Environnent à la Réunion-Réussir l'innovation	Gerri	governance	2008
cNat38	newspaper article	La Réunion, île modèle en 2030	Journal du Dimanche	journalism	2009
cNat39	speech	Déclaration de M. Nicolas Sarkozy, Président de la République, sur les efforts en faveur du développement économique de La Réunion, à Saint-Pierre le 19 janvier 2010	Nicolas Sarkozy, French President	governance	2010
cNAT40	report	Les énergies renouvelables ZNI-mer : laboratoire pour notre avenir	Economic, Social and Environmental Council	governance	2011
cRUN41	newspaper article	GERRI, vers une révolution énergétique pour La Réunion et par les Réunionnais ?	Témoignages	journalism	2008
cRUN42	interview	Trois questions à … Paul Vergès, président du Conseil régional de La Réunion	Federation of Elected Officials of Local Public Companies	politics	2008
cRUN43	newspaper article	Il est né, Gerri, le premier enfant du Grenelle de l'Environnement	Témoignages	journalism	2008
cRUN44	report	plan de relance régional (associated to c46)	Regional authority of Reunion	governance	2021
cRUN45	debate	séance plénière de la région 2020	Regional authority of Reunion	governance	2020
cRUN46	blog article	Développement durable - La Réunion signe le premier accord d'application ZNI-mer du Grenelle de l'environnement	Banques des territoires	financing institution	2008
cMA47	newspaper article	Grenelle de l'environnement : nos députés montent au créneau	France Antilles Martinique	journalism	2007
cMA48	newspaper article		La Tribune des Antilles	journalism	2008
cMA49	newspaper article	Grenelle de l'Environnement	La Tribune des Antilles	journalism	2007
cMA50	newspaper article	Solaire : Appel d'offres de la CRE	France Antilles Martinique	journalism	2009

cMA51	newspaper article	MARTINIQUE - PHOTOVOLTAÏQUE : LE PALIMA S'OPPOSE A LA SPECULATION SUR LES TERRES AGRICOLES	La Tribune des Antilles	journalism	2010
cMA52	blog article	Transition énergétique : La Région Martinique au coeur de l'action	Ewag	journalism	2013
cMA53	newspaper article	Energies renouvelables : la Martinique en retard	France antilles martinique	journalism	2011
cZNI54	speech	Déclaration de M. Victorin Lurel, ministre des ZNI-mer, sur les orientations stratégiques du gouvernement pour la politique de l'énergie dans les ZNI-mer dans le cadre du futur projet de loi de programmation de la transition énergétique, à Paris le 10 juillet 2013.	Victorin Lurel, Overseas minister	governance	2013
cNat55	report	Quelles transitions énergétiques pour les ZNI-mer ?	Economic, Social and Environmental Council	governance	2024
cZNI56	report	Rapport d'information sur l'autonomie énergétique des ZNI-mer	Overseas Territories Delegation, National Assembly	governance	2023
cMA57	newspaper article	La Martinique, laboratoire du nouveau modèle énergétique	France Antilles Martinique	journalism	2014
cNat58	presentation	NEMO, un projet innovant basé sur la technologie d'Energie Thermique des Mers	International Union for Conservation of Nature	industry	2015
cInt59	dossier de presse	Éolien en mer au large de l'île de la Réunion enjeux et opportunités	akuo/bluefloat	industry	2024
cRUN60	video	2040 scenario gris/ scenario vert	temergie	industry	2020
cMA61	report	Synthèse des ateliers thématiques (février 2023) Révision de la Programmation Pluriannuelle de l'Énergie (PPE) 2024-2028 et 2029-2033 de Martinique	Directorate for the Environment, Planning, and Housing (DEAL)	governance	2023
cNat62	report	Les soutiens publics aux zones non interconnectées (ZNI)	Court of Auditors	governance	2023
cRUN63	report	Programmation pluriannuelle de l'énergie Réunion 2016-2018/2019-2023 (rapport)	Regional authority of Reunion, prefecture	governance	2017
cRUN62	report	Assemblée plénière du Conseil Régional – 9 février 2022 (Rapport n°111875)	Regional Council	governance	2022
cMA63	report	Programmation pluriannuelle de l'énergie de la Martinique 2015-2018/2019-2023 (rapport)	CTM, prefecture	governance	2017
cMA64	slides	Contexte général des ENR (PV/éolien) en Martinique et bilan de la PPE 2016-2023	DEAL, CTM, consulting group	governance	2023
cMA65	slides	ATELIER ENR FILIÈRES GÉOTHERMIE, ENERGIES MARINES, HYDROÉLECTRICITE	DEAL, CTM, consulting group	governance	2023
cMA66	slides	Atelier filière agricoles	DEAL, CTM, consulting group	governance	2023

cMA67	slides	Atelier filière déchets	DEAL, CTM, consulting group	governance	2023
cMA68	slides	Atelier filière Bois/ Forêt /Plantes invasives	DEAL, CTM, consulting group	governance	2023
cMA69	mental maps	carte mentale-houlomoteur	DEAL, CTM, consulting group	governance	2023
cMA70	mental maps	carte mentale-biomasse	DEAL, CTM, consulting group	governance	2023
cMA71	mental maps	carte mentale-éolien	DEAL, CTM, consulting group	governance	2023
cMA72	mental maps	carte mentale-géothermie	DEAL, CTM, consulting group	governance	2023
cMA73	mental maps	carte mentale-hydro	DEAL, CTM, consulting group	governance	2023
cMA74	mental maps	carte mentale-PV	DEAL, CTM, consulting group	governance	2023
cMA75	slides	Production-EolienPVHoulomoteur - plénière	DEAL, CTM, consulting group	governance	2023
cMA76	slides	Production-autres EnR	DEAL, CTM, consulting group	governance	2023
cZNI77	newspaper article	En troquant le fioul pour le colza, EDF pratique le greenwashing	Mediapart	journalism	2023
cZNI78	speech	Déclaration de Mme Ségolène Royal, ministre de l'écologie, du développement durable et de l'énergie, sur les enjeux et les grandes orientations du projet de loi sur la transition énergétique, à l'Assemblée nationale le 1er octobre 2014.	Ségolène Royal, Minister for Ecology and Energy	governance	2014
cMA79	newspaper article	La transition énergétique en Martinique, c'est maintenant	Frances Antilles	journalism	2014

2. Legal Texts and Debates

ID	resource type	title	author	year
l1	legal act	Grenelle 1	National government	2009
l1-0	draft law	Projet de loi de programme relatif à la mise en œuvre du Grenelle de l'environnement,	National government	2008
l1a	debate	Grenelle 1: rapport de travaux de commission (Assemblée)/	National assembly	2008
l1b	debate	Grenelle 1: compte rendu intégral des débats première lecture Sénat (27.01-10.02) / débats relatifs outre mers	Senate	2009
l1c	debate	Grenelle 1: rapport de travaux de commission 2 (Assemblée)	National assembly	2009
l1d	debate	Grenelle 1: compte rendu intégral des débats deuxième lecture Sénat	Senate	2009
l1e	debate	Grenelle 1: commission paritaire	Joint Parliamentary Committee (Commission mixte paritaire)	2009
l2	legal act	Grenelle 2	National government	2010
l2a	debate	Grenelle 2: compte rendu intégral des débats première lecture Senat	Senate	2009
l2b	debate	Grenelle 2: première lecture assemblée, rapport	National assembly	2010
l2c	debate	Grenelle 2: compte rendu intégral des débats commission mixte paritaire	Joint Parliamentary Committee	2010
l3	legal act	Loi sur la croissance verte 2015	National government	2015
l3a	debate	Texte introductif du projet de loi	Minister of ecology, sustainable development, and energy	2014
l3b	debate	Loi 2015: première lecture assemblée, rapport	National assembly	2014
l3c	debate	Loi 2015: compte rendu intégral des débats première lecture Sénat	Senate	2015
l3d	debate	Loi 2015: rapport de la Commission mixte paritaire	National assembly	2015
l3e	debate	Loi 2015: nouvelle lecture assemblée, rapport	National assembly	2015
l3f	debate	Loi 2015: nouvelle lecture Sénat, débat	Senate	2015
l3g	debate	Loi 2015: lecture définitive rapport assemblée	National assembly	2015
l4	legal act	Loi accélération des énergies renouvelables	National government	2023
l4a	debate	Texte introductif du projet de loi	Minister for the Energy Transition	2022
l4b	debate	Loi APR première lecture Senat, débats	Senate	2022
l4c	debate	Loi APR première lecture assemblée rapport	National assembly	2022
l4d	debate	Commission mixte paritaire	Joint Parliamentary Committee	2023