Probing the role that Third-party Collective Self-Consumption plays for reaching the goals of the Clean Energy for all Europeans Package

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Abstract/Executive Summary

The 2019 Clean Energy for all Europeans Package (CEP) is a landmark piece of legislation in Europe to harmonise the rules for the decentralisation of the European energy system. Until only recently, large energy companies have started to advertise 'energy communities' that adopt the Third-party Collective Self-Consumption (TCSC) business model. Some analysts claim that companies who use this business model attempt to capture renewable energy projects that are owned and controlled by local communities. This research contributes to the debate by probing the business model from the perspective of the energy justice implied by the CEP. The theoretical framework mainly builds on Heldeweg, and Saintier (2020)'s conceptualisation of the CEP and employs Pel (2016)'s definition of corporate capture. The research narrows into the case of the Bicesse Kindergarten project developed by Greenvolt Comunidades. A coding analysis was applied to data collected using semi-structured interviews complemented by secondary source material. The findings of this research suggest that large energy companies using the TCSC business model provide tangible benefits to their clients, moving the process of decentralisation forward. However, their role should not be overestimated, TCSCs addresses the decentralisation that is implied in the CEP only in part. Member States (MSs) should refrain from overly relying on, or substituting, this market-

provided solution to decentralisation with processes of community ownership and control in local energy projects. Large energy companies should also avoid convoluting the CEP's language on Renewable Energy Communities (REC) with their business model.

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List of Abbreviations

CEC: Citizen Energy Community

EU: European Union

MS: Member State

PPA: Power Purchase Agreement

REC: Renewable Energy Community

SME: Small and Medium sized Enterprise

TCSC: Third-party Collective Self-Consumption

1. Introduction

1.1   Broader context

Since the 1990s, the EU has attempted to form a single energy market by opening domestic markets, privatising energy companies, breaking up state monopolies and unbundling services. The result has been more competitive energy markets in a more centralised energy system, owned by a handful of multinational corporations. This process has reinforced the role of the citizen as a consumer in the energy system (Berka, and Dreyfus 2021).

This is starting to change, involving citizens in local energy projects has gained a lot of traction in EU policy circles. The 2015 Energy Union Strategy recognised the need to move beyond traditional governance structures to address the multiple crises the European energy system faces. It places the citizen "at the centre" of the energy transition (Roberts 2020, 236). Decentralising energy systems by engaging with citizens incentivises multi-scalar energy efficiency improvements, it generates private investments from consumers, it bolsters competitivity, energy security, and it circumvents issues relating to the local acceptance of energy projects (Van de Graaf, and Colgan 2016; Berka, and Dreyfus 2021; Laes, and Bombearts 2022).

The resulting Clean Energy for all Europeans Package (CEP) marks a departure from the EU's energy policy status quo (Roberts 2020). It acknowledges that citizens face unique challenges when attempting to participate in the energy transition but play a valuable role in the EU's decarbonisation strategy. It obliges Member States (MSs) to design enabling frameworks which eliminate unfair barriers and create markets with level playing fields for communities who wish to kickstart or gain ownership in a local energy project (Lowitzsch, Hoicka, and van Tulder 2020). The 2018 revision of the renewable energy directive included in the package is coated in energy justice. It states that MSs "should ensure

that those measures are accessible to all consumers, in particular those living in low-income or vulnerable households" (European Union 2018, Article 22(4f)).

1.2   Relevance

An important point of contention in the interinstitutional negotiation of the CEP centred around the involvement of large energy companies who stand to lose market share from citizens gaining ownership over the means of energy production. During the process, large energy companies expressed interest in fitting within legal definitions of 'energy communities' in order to gain new regulatory benefits, and package new products to consumers. The resulting framework is meant to prevent large energy companies from ownership and control in community-led energy projects (Fina, and Fechner 2021; Krug et al. 2023; Roberts 2020).

Until only recently, large energy companies such as Repsol or EDP have begun marketing 'energy communities' to consumers (Repsol, n.d.; EDP 2023). The affordability and modularity of solar PV is currently creating business cases for rolling out installations on rooftops (SolarPower Europe 2023). Using existing artificial surfaces generates energy at the point of consumption, reducing the environmental impact of projects and effectively increasing efficiency while reducing reliance on the grid. At the same time, large energy companies often face local opposition when deploying large scale energy projects (Kirch Kirkergaard et al. 2021). Recognising this, companies are exploring a utility-scale business model which harnesses the economies of scale of PV, while engaging with, and gaining the support of local communities.

The business model is based on signing a Power Purchase Agreement (PPA) with a main client. This is a long-term contract with a client who agrees to buy or self-consume energy from an installation for a set number of years, at a fixed price (Cuervo, Arredondo-Orozco, and Marenco-Maldonado 2021). In return, the energy company comes up with the upfront capital investment, it

takes care of the permitting, the installation and the management of the project. At the end of the contract, the anchor member gains ownership of the installation (Pereira 2023; SolarPower Europe 2023). In this paper, this business model is referred to as a Third-party Collective Self-Consumption (TCSC).

In Muñoz-Padrós, and Marcos (2024)'s investigative piece on Spanish energy companies, they claim that this business model is a "perversion of the spirit in which energy communities were born, and in the worst cases, a capture of public funds".[1] Scharnigg, and Sareen (2023) conclude that "whether all actors will benefit sufficiently to make the model desirable to replicate remains uncertain" (7). There remains a lack of academic attention probing the business model in greater detail due to its only recent emergence.

Some scholars further argue that community ownership in local energy projects enhances the benefits that local communities can accumulate (e.g. Seyfang, Park, and Smith 2013; Hicks, and Ison 2018). Ownership guarantees that democratic control and participation is exercised by the citizens located in the vicinity of the decentralised renewable energy generation project (Szulecki 2018). In turn, this serves to increase their transformative potential (Vrettos, Hinton, and Pereira 2024), by fairly dispersing the costs and benefits of common pool resources within communities (Seyfang, Park, and Smith 2013; Szulecki, and Overland 2020), and by fostering collectively designed and locally specific, demand-side solutions (Barnes et al. 2022).

Community ownership and control of energy projects is sometimes referred to as 'energy communities' which overlaps with energy justice. The former evokes locality, ownership and scale whereas the latter is a framework for critically reflecting on the injustices that our energy system generates (Jenkins et al. 2016). Policies that support equitable access to local renewable energy

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[1] Translated by the researcher from "perversión del espíritu con el que nacieron las comunidades de energía y, en el peor de los casos, acaparamiento de fondos públicos."

generation have the potential to mitigate the injustices usually associated with centralised energy systems (e,g. energy poverty), however their deployment occurs in a power-laden context that may reproduce existing injustices (Hanke, Guyet, and Feenstra 2021).

1.3   Research aims and objectives

Companies selling TCSCs can be considered to propose a new starting point for decentralised renewable energy projects involving local communities. It is still unclear whether and the extent to which companies selling TCSCs promote energy justice, particularly in light of the landmark ambitions set in the CEP. This gap in the literature is growing in relevance as the use of TCSC grows across Europe. By looking at a case in greater detail, this research aims to cast nuance on this emergent business model. For this reason, it asks: to what extent do energy companies selling TCSCs deliver decentralised renewable energy generation projects that reflect the energy justice implied by the directives included in the CEP? This question probes:

1. The distribution of costs and benefits the business model entails when decentralising energy consumption at the point of consumption in light of the CEP

2. It also seeks to uncover the extent to which the kind of energy justice implied by companies selling TCSC co-opts the CEP.

To provide answers to the research question, the research narrows into the Bicesse kindergarten project advertised as an "inclusive energy community" by Greenvolt Comunidades, a wholly owned subsidiary of the Greenvolt group (Greenvolt, n.d., A.). This project, located in Portugal, has been advertised to EU policymakers as a success story needing replication across Europe (e.g. Pereira 2023). Kadri Simson, the commissioner for energy, and Ana Mendes Godinho, the Portuguese Minister of Labour, Solidarity and Social Security, gave their formal public support by visiting the project (Greenvolt, n.d., A). This case was selected to provide most nuance to the research

question. First, it bears broader European relevance for the growth of TCSC in Europe. Second, it is most representative of the way in which large energy companies deliver decentralisation in an energy just way.

1.4 Thesis outline

The literature review is divided into six subsections which are permeated by energy justice. The following chapter introduces the theoretical framework for the analysis. It builds on the work of Heldeweg, and Saintier (2020) to develop an energy justice framework based on the legal requirements included in the CEP. It also articulates Pel (2016)'s understanding of corporate capture. The third chapter of this paper explains the reasoning behind the choice of methodology. It is based on a coding analysis of interview data, complemented by secondary source data. The results chapter presents the findings structured into six codes trees. The paper then gives way to the discussion chapter where the results are framed in light of the theoretical framework. The final chapter provides addresses the research question directly.

2. Literature review

2.1 Chapter overview

The first subsection discusses academic contributions which argue that involving citizens in local energy projects enhances the transformative potential of decentralisation. The review then moves on to the barriers that prevent, particularly low-income communities, from participating in energy decentralisation. The third subsection discusses research on those actors that lower barriers to decentralised renewable energy projects i.e. niche development intermediaries. The fourth subsection clarifies the relevance of the debate on transition pathways and corporate capture. Fifth, TCSCs are placed in the context of the scholarship on market-based delivery of transitions. Finally, the research

on the TCSC business model in Portugal is reviewed, particularly considering the existence of consumer stock ownership plans.

2.2   *Community ownership and control in local energy projects*

Policy makers and researchers use 'energy community', 'community energy', 'citizen-led energy project' interchangeably. The consensus in the field seems to be that a unique definition is too reductive for the amount of possible configurations energy projects involving citizens can have (Bauwens et al. 2022). Despite the lack of a common term, it can be said that the field is interested in the benefits of, the way in which, and the extent to which, citizens are involved in local energy projects (Busch, Ruggiero, Isakovic, and Hansen 2021).

Purely from a technical perspective, there are important benefits to decentralising renewable energy generation at the point of consumption. Decentralised renewable energy generation reduces reliance on fossil fuels, transmission losses and grid-use. It provides broader opportunities for renewable energy uptake, and it is more efficient than fully relying on centralised electricity generation and distribution. It increases energy security, system resilience and generates private capital for the energy transition (Busch, Ruggiero, Isakovic, and Hansen 2021; Wu, Xu, and Yang 2021).

Beyond the benefits resulting from technical efficiencies, academic contributions to the field have highlighted how decentralising renewable energy generation by transferring ownership to communities creates other tangible and intangible benefits. From the perspective of transformation theory, when a socio-technical system can no longer be sustained due to the erosion of human or natural systems. There is a need to reconfigure key system conditions and bring back social or ecological variables within desired trajectories. This strand of literature therefore posits that rigid social structures, particularly concentrated decision-making, can prevent system dynamics from being brought back under control. Reconfiguring the governance of energy projects enhances the

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transformative potential of energy decentralisation. In other words, distributing the ownership and control of energy projects to local communities can provide better conditions for fairly using common pool resources and sharing the costs and benefits, within planetary boundaries (Vrettos, Hinton, and Pereira 2024).

Moreover, scholarship indicates that processes of collective decision-making and participation tend to enhance demand-side solutions (Busch, Ruggiero, Isakovic, and Hansen 2021; Wu, Xu, and Yang 2021). Existing evidence suggests that community-based action is uniquely positioned to foster demand-side solutions. Collective action tends to activate consumers, improve their knowledge of energy and enhance the impact of individual initiatives. Collective action also allows sociotechnical solutions that cannot be achieved individually (Barnes et al. 2022). Seyfang, Park, and Smith (2013) argue that community-led energy projects maximise benefits for members because they are better equipped to identify locally acceptable solutions to complex problems. Hicks, and Ison (2018) argue that energy projects with self-consuming single households controlled by corporate actors result in fewer benefits stemming from community-building and collective action. Barnes et al. (2022) conclude that local collective action on energy "has a distinct capacity to develop demand-side solutions, rooted in the creation of innovative sociotechnical configurations" (1). Therefore, community ownership and control of local energy projects generates community benefits that go beyond those solely stemming from decentralised renewable energy production at the point of consumption.

These findings echo from an extensive academic tradition arguing that weaker forms of citizen involvement in energy projects generate fewer community benefits. Lovins' "hard" and "soft" energy paths articulated an early understanding of the politics which condition energy decentralisation and community benefits. It pits the "hard path": high voltage grids, large-scale generation, centralised bureaucracies, system expansion. With the "soft path" characterised by decentralising the energy system based on locally defined needs, energy efficiency, risk dispersion, citizen participation,

renewable energy and flexibility (Lovins 1977 in Strachan et al. 2015, 98, 99). It is however Walker and Devine-Wright (2008) who first develop a consistent theoretical approach to discuss what energy projects involving citizens can entail in practice. They posit that energy projects can demonstrate varying degrees of community involvement. The process can range from "distant and private" to "open and participatory" on the Y axis. The outcome or resulting benefits range from "closed and institutional" to "local and collective" on the X axis (498). Strachan et al. (2015) offer an insightful abstraction here, the higher megawatt/hour capacity of an energy project, the lower the community engagement, ownership and beneficiation. Conversely, the higher the likelihood that the project garners local opposition (Kirch Kirkegaard et al. 2021). Therefore, the more communities are involved in energy projects the higher the likelihood that the project generates local benefits. However, community participation remains conditioned by the power structures which constitute the centralised energy system.

Nevertheless, democratic control and community ownership in local energy projects is not shared by the entirety of the field. Bauwens et al. (2022)'s systematic review of 183 definitions finds "a weakening of scholars' attention to 'transformative notions' of community emphasizing collective and grassroots processes of participation in energy transitions, to the benefit of 'instrumental' notions. This trend runs the risk of placing the sole emphasis on the market value of communities, thereby diluting their distinctiveness from more commercial actors" (1). This case study lies at the intersection of this conceptual difficulty. There is a need to both recognise that the field lacks a common definition of what an 'energy community' might be, which is positive for broad inclusion. While at the same time, convoluting genuine community-led energy projects with commercial schemes benefitting distant shareholders, can contribute to the marginalisation of transformative sociotechnical innovations.

The CEP provides some clarity on what constitutes an 'energy community'. The Citizen Energy Communities (CEC) and Renewable Energy Communities (REC) definitions both refer to collectively owned, non-commercial energy projects. A REC is a subset of a CEC, it is stricter in terms of eligibility, electricity generation technology and control. Although energy companies can facilitate the creation of RECs or CECs, they are barred from exercising ownership or control in these legal entities, underpinning the importance of citizen participation (Roberts 2020).

The CEP brings neoliberalism (devolving and pushing out responsibilities to the individual) in friction with communitarianism (bottom-up association and collective sharing). This friction creates unresolved issues which MSs must address in the transposition and implementation process of the CEP (Laes, and Bombaerts 2022). This process has differed widely across the EU, leaving important regulatory loopholes (Frieden et al. 2021). Not least in Portugal where the definition of CEC is not yet transposed, RECs are underused and most projects are being channelled through collective self-consumption or TCSC (European Commission 2021). It still remains unclear how MSs resolve competing visions of democratic control in practice. And to whom and how, costs and benefits are geographically distributed (Laes, and Bombaerts 2022). TCSC offers a valuable case to study, it provides an iteration of a viable model which addresses those frictions. It is however unclear from the literature the extent to which TCSC is a desirable business model to address the implementation of the CEP.

2.3 Barriers and fairness

The barriers preventing the participation of citizens in local energy projects have been studied extensively. Communities usually lack the expert knowledge, the financial resources or/and face unfair administrative burdens. These barriers are conditioned by a variety of cultural, economic, social and political circumstance (Coenen, and Hoppe 2022; Bauwens, Gotchev, and Holstenkamp 2016).

Therefore, the extent to which communities evenly benefit from decentralising energy is also constrained by the regulatory or enabling frameworks within which citizen-led energy projects are allowed to burgeon.

For instance, wealthier or educated communities tend to face fewer barriers in setting-up citizen-led energy projects (Berka, and Dreyfus 2021). In fact, the lower the socioeconomic background of the community, the lower the likelihood of developing a project from the ground-up (Hanke, Guyet, and Feenstra 2021). Advocates of community ownership and control have been criticised for failing to consider the height of barriers preventing lower-income groups from participating, particularly in regions with lower GDP per capita (Szulecki, and Overland 2020). Barriers remain higher in financially constrained contexts, this limits the uptake of transformative business models in all regions of Europe (Seyfang, Parks, and Smith 2013). For this reason, the diffusion of a business model cannot be understood outside of its regulatory context. An analysis of TCSC is incomplete without properly incorporating the barriers preventing, and the measures enabling the adoption of this business model.

At the same time, the ambition of the CEP's enabling frameworks is to lower national barriers to citizen ownership and control in local energy projects (Busch, Ruggiero, Isakovic, and Hansen 2021). MSs must facilitate procedures and provided the resources needed for citizens, including vulnerable groups, to kickstart or gain ownership in local renewable project (Frieden et al. 2021). The implementation of the CEP's enabling framework or the lack thereof, has important implications for reaching lower income communities with the same costs and benefits when decentralising the energy system i.e. important implications for energy justice.

2.4   *Large energy companies acting as intermediaries*

Large energy companies selling TCSCs or national energy cooperatives facilitating RECs are effectively bridging the demand for decentralised renewable energy generation at local level with the financial capital and expertise needed. Niche development intermediaries has now emerged as a field to explain those public, private or not-for-profit actors that emerge to facilitate the deployment of decentralised renewable energy projects involving citizens (Kivimaa, Boon, Hyysalo, and Klerkx 2019). Van Lente, Hekkert, Smits, and Van Waveren (2003)'s seminal contribution introduces intermediating as a process where connecting actors brings transitions forwards. Intermediaries perform bridging or relational roles to overcome pervasive barriers, diffuse necessary expertise and capital.

Mohammadi (2023) argues that intermediaries have been particularly useful in contexts where barriers such as free time, knowledge of business models or upfront capital expenditure are too high. Lacey-Barnacle, and Bird (2018) find that not-for-profit and public sector intermediaries for citizen-led energy projects positively influence the delivery of energy justice in times of austerity. However, there remains a lack of knowledge on how for-profit intermediaries decentralise energy in lower-income contexts (Scharnigg, and Sareen 2023). Kivimaa, Boon, Hyysalo, and Klerkx (2019) explain that intermediaries have varying levels of normative support for transformative change. The literature has been split over whether intermediaries limit their role to facilitating connections between actors or substantially shape the connections that occur. It is becoming increasingly relevant to understand the role that energy companies, acting as intermediaries play for decentralising the energy system in just and fair way, particularly in low-income contexts. This gap in the literature grows as the use of TCSC continues to grow.

Understanding the role that large energy companies can play in decentralising the energy system is all the more relevant after considering the scholarship arguing that these companies use

power to thwart or hold back transformative change from taking place. Authors argue that large energy companies use collusive power i.e. their tight relationship with governments, to shape sociotechnical transitions at the expense of community-led energy projects (Laes, and Bombaerts 2022; Cherp et al. 2018). In Spain, energy companies actively colluded to benefit most from the system of subsidies and promoted barriers to community-led energy initiatives (Capellán-Pérez, Campos-Celador, and Terés-Zubiaga 2018). In the UK, energy market incumbents have successively exploited renewable energy subsidies more efficiently than citizen-led energy projects (Strachan et al. 2015). In Denmark, large energy companies have pushed community-owned wind out of the market (Kirch Kirkegaard et al. 2021). According to Berka, and Dreyfus (2021), large energy companies, or market incumbents, use their privileged positions within the existing sociotechnical regime to actively shape who can benefit and participate in the decentralisation of the European energy system. These findings suggest that the involvement of for-profit energy companies in decentralising the energy system may unevenly distribute or divert the benefits of local energy projects.

It is also worth mentioning scholarship arguing that energy companies reproduce energy injustices. An extant amount of case studies document how large energy companies participating in the energy transition exhibit rapacious behaviour towards lower-income or marginalised communities (Sareen, and Kale 2018; Yenneti, Day, and Golubchikov 2016; Stock, and Sovacool, 2023; Allan, Lemaadel, and Lakhal 2022; Rignall 2016). Large-scale renewable energy projects led by energy companies tend to reproduce the same industrial relations observed under fossil fuels i.e. privatising the commons and dispossessing vulnerable communities for the benefit of distant consumers and shareholders. This underscores the importance of probing their increasing involvement in intermediating decentralised renewable energy generation, particularly with lower-income, energy poor or vulnerable groups.

2.5   Corporate capture of 'energy communities'

Corporate capture has been used in many policy domains including energy to conceptualise incumbent behaviour engaging in strategies which subvert technological transitions or absorb demands of power redistribution (Pel 2016; Späth, Rohracher, and von Radecki 2016; Matschoss, and Heiskanen 2018). In Europe, energy companies increasingly recognise that narrative realignments are necessary to continue capturing EU public support and funding in a decarbonising energy market (e.g. Stern 2019).

Although some companies may have been incentivised to involve citizens in energy projects before the CEP, most energy companies were not interested in participatory energy projects at first (Lowitzsch, Hoicka, and van Tulder 2020; Barnes 2019). The CEP has undoubtedly incentivised energy companies to adopt new roles (Lowitzsch, Hoicka, and van Tulder 2020; Fina, and Fechner 2021; Krug et al. 2023). They now perceive new incentives to participate in energy decentralisation which calls for paying attention to the risks of appropriation brought about by their involvement.

The regime position of energy companies maintains their interest in reproducing system conditions i.e. maintaining ownership and control over the means to produce energy (Kivimaa et al. 2019; Strachan et al. 2015). Gramsci's 'trasformismo' has inspired many scholars to look into the strategies that powerful actors use to subvert transformative change. These strategies revolve around maintaining hegemony by co-opting alternative policy solutions and realigning these demands with incumbent interests (Tilsted et al. 2022). Energy companies have used rhetorical devices to undermine disruptive solutions and absorb resentment for the status-quo without fundamentally altering their industrial relations (e.g. Selam 2006; Wright, Irwin, Nyberg, and Bowden 2022). Furthermore, Stirling (2014) argues that technical or technological transitions can occur without fundamentally reconfiguring the power distribution needed for system transformation. Scholarship seems to suggest

that narratives of transformation espoused by large energy companies acting as intermediaries may aim to conceal practices which prevent energy regime transformations.

Corporate capture has been used to describe attempts that alter the direction that transition pathways take. According to Stirling (2014), dominant regime actors can lock radical sociotechnical solutions out of broader diffusion and lead to marginal change. This suggests that, following a capture, transition pathways can be thwarted and have differing end results. However, van Lente, Hekkert, Smits, and Van Waveren (2003) suggests that sociotechnical transition pathways constitute several (competing) pathways leading to the same end result. Pel (2016) supports this idea. He argues that the use of deceiving tactics is part of a contentious innovation process. In this sense, 'capture' forces actors to evolve their meanings, leading to productive outcomes. The findings of this research incorporate Pel's insights in order to contribute to this debate.

2.6 Market provided decentralisation

The emergence of companies selling TCSC must be understood in the broader context of European energy market reforms. The CEP forms part of the first harmonised rules for energy decentralisation, falling within the EU's wider integration of the European energy system. EU energy market reforms centre on the political philosophy that transitions occur through marketisation (Kirch Kirkegaard et al. 2021). Laes, and Bombaerts (2022) explain that some of the CEP's focus on an enabling framework aims to reduce the barriers to citizen-led energy projects which serves to increase access to, and competition in, the energy market. This can also risk bringing community-led energy projects into more direct competition with large energy companies over the cost-efficient provision of services, the availability of subsidies and space for installations.

Berka, and Dreyfus (2021) explain that it is unrealistic to assume that communities and large energy companies compete on a level playing field. Citizens are not rational actors, they do not possess

the same amount of information and resources. Whereas energy market incumbents possess large bureaucracies, professionalised workforces and are characterised by economies of scale. Increasing competition without adequate support mechanisms for weaker, yet valuable, market participants benefits powerful actors (Silvast 2017).

Kirch Kirkegaard et al. (2022) offer valuable insights into the trade-offs that marketisation can entail for energy decentralisation. In their case study of Danish community-owned wind pioneers, they explain that although favourable investment conditions early-on made pooling resources and affording small-scale wind feasible. The introduction of new legislation centring on marketisation forced communities to compete with economies of scale. Returns sank which increased the uncertainty of returns on investments. This contributed to lowering the levelized cost of energy, conversely the costs of initiating a viable energy project dramatically rose. Marketisation fosters a pathway that privileges larger energy projects, concentrating megawatt/hours into increasingly fewer hands. Large energy companies and their consumers benefit at the expense of community-owned projects being bought-up. This correlates with lower social acceptance of renewable energy projects in Denmark. Similar trends have been observed in Germany, Belgium and the UK (Bauwens, Gotchev, and Holstenkamp 2016).

Lennon et al. (2020) furthermore notes that in the CEP "there is a clear emphasis on encouraging consumers (rather than citizens) to participate in the energy system" (10). The critical school of participatory theory argues that participatory processes channelled through markets limits the role of the citizen to that of consumer i.e. participation reduced to sporadic consultations of individual preferences (Aylett 2013). Whereas some authors (e.g. Walker, and Devine-Wright 2008; Seyfang, Park and Smith, 2013; Hicks, and Ison 2018) argue that communities face multifaceted issues which require activating complex processes of collective participation in the energy system.

The academic scholarship reviewed in this subsection indicates that solely relying on the market-based provision of energy services could alter the transformative potential of decentralised renewable energy projects, to the benefit of market incumbents. There is however a lack of conclusive research on market provided decentralisation. Probing TCSCs could generate novel insights, particularly as the business model contends between economies of scale and community participation and benefits.

2.7   TCSC in Portugal

Scharnigg, and Sareen (2023) produced a piece of research directly relevant to this case study. They surveyed public, private and non-profit intermediaries that help to overcome knowledge and financial barriers to setting-up decentralised renewable energy projects involving citizens in Portugal. Not-for-profit and private sector intermediaries have stepped in to roll-out decentralised renewable energy projects while a systemic lack of government involvement persists. Among other, they observe that companies selling TCSCs successfully facilitate bureaucratic processes, overcome information barriers, reduce investment uncertainty and accelerate the deployment of solar power technology.

On the one hand, the authors warn that energy companies selling TCSC have "little incentive to help reduce energy expenditure and relinquish control over the means of energy production" (7). TCSCs may decrease community benefits by limiting community control and participation. On the other hand, they note that energy companies selling TCSCs can overcome pervasive barriers by improving the cost-efficient deployment of services relating to setting-up renewable energy projects, enhancing access to decentralised renewable energy, particularly in low-income or vulnerable contexts. Scharnigg, and Sareen (2023)'s research forms a valuable starting point to understand the emergence of TCSC. There however remains a gap in the field's understanding of the distribution of costs and benefits that TCSCs generate, and whether those are desirable in the context of the CEP.

At the centre of issues regarding the community ownership and control of local energy projects, is the viability of business models (Reis, Gonçalves, Lopes, and Henggeler-Antunes 2021). There is incredible heterogeneity between business models, leading to unique constellations of ownership and effective control (Rohracher, and Späth 2014; Busch, Ruggiero, Isakovic, and Hansen 2021). Third-party financing exposes projects to the loss of autonomy or the dilution of community benefits (Roberts 2020; Lowitzsch 2019). Therefore, citizen-led energy projects, particularly in lower-income scenarios may feel compelled to resort to third-party financing schemes, however RECs and CECs prevent third-party ownership by energy companies.

Consumer stock ownership plans for RECs is an existing business model which addresses many of these issues. It is is a financing scheme which allows third-party financing while guaranteeing that participating consumers maintain effective control. In this model, savings from self-consumption or revenue from selling excess production to the grid repays the energy company. It never exercises any control over the project and the profit margin is regulated. This business model allows any community, in particular low-income households, to collect the benefits of participating in an REC. It taps into the economies of scale of energy companies while benefits and voting rights are evenly distributed to all members, reflecting the goals of the CEP on third-party ownership rules (by energy companies) (Lowitzsch 2019). The existence of this approach raises concerns over the need for TCSC in the first place.

2.8 The research gaps

Due to the size of the energy field and the breadth of this chapter, it is worth articulating the relevance of this research in short. The first subsection of the literature review discusses the transformative potential of decentralised renewable energy projects involving citizens. However, the extent to which communities own and control local energy projects is conditioned by the power

structures of the centralised energy system. In the implementation of the CEP, it is still unclear how companies selling TCSCs address the contradictions that arise when decentralising renewable energy generation at the point of consumption. Namely, with democratic control, and with the geographical distribution of costs and benefits.

The second subsection explains how barriers prevent citizens, particularly lower-income communities, from taking part in energy projects. This creates an uneven distribution of the costs and benefits stemming from decentralisation. Therefore, energy justice research must probe TCSCs in conjuncture with their enabling framework. This spills into the next subsection which introduces the field of niche development intermediaries as actors that play an important role for delivering on energy justice because they can overcome pervasive barriers to decentralised renewable energy projects. However, there is a lack of research on the exact role that for-profit intermediaries play. Particularly large energy companies who exhibit regime interests that may come at the expense of communities.

The fourth subsection brings attention to scholarship which scrutinises how powerful actors take part in transitions. The academic debate over how attempts at capture affect the direction of transition pathways remains open.

In the fifth subsection, transition scholars argue that marketisation engenders important energy transitions trade-offs between economies of scale and community participation. However, TCSCs are a really interesting case to study because they are meant to be 'decentralised' or smaller scale meanwhile pursuing economies of scale. For this reason, research on TCSCs could generate novel insights on the benefits that marketisation can generate for decentralising renewable energy.

The final subsection discusses existing findings on TCSCs in Portugal. It highlights the need for research which brings more conclusive insights into the role that TCSCs can play in rolling-out the CEP in an energy just way. Particularly considering the existence of consumer stock ownership plans for RECs.

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3. Theoretical framework

3.1 Chapter overview

Designing the theoretical framework took into account two conceptual difficulties identified in the literature review. Namely, the lack of a common definition of 'energy community'. And, the need for energy justice research interested in decentralisation to pay attention to the enabling framework. The first subsection explains the theoretical choices made in terms of defining an 'energy community'. For the purpose of clarity, a subsection then explains the difference between an activity and a legal entity in the CEP. The third subsection defines the 'enabling framework'. The chapter then moves on to the central concepts guiding the analysis: the energy justice framework and corporate capture, complemented by some concepts from the field of niche development intermediaries.

3.2 Energy community

Before introducing the central concepts that will guide the analysis. There is a pragmatic need to define 'energy decentralisation'. Although it has many definitions, in this paper, it is defined as the shift to localised systems of energy generation and consumption (Judson et al. 2020). This broad definition is particularly useful because it encapsulates all the governance models mentioned in this paper (e.g. REC, TCSC).

When it comes to defining 'energy community', the literature review reveals that it is difficult to pick a single definition as there is a lack of agreement over what an 'energy community' constitutes. To depart from this difficulty, it could have used the framework ideated by Walker and Devine-Wright (2008) which proposes a fluctuating meaning for 'energy community' along two axes. Nevertheless, because the ambition of the CEP is the central focus of this research, its definitions are at the centre of the analysis. The package introduces the two definitions of REC and CEC.

Article 2(16) of the 2018 recast renewable energy directive defines a REC as a non-commercial legal entity characterised by autonomous, open and voluntary participation. Its members or shareholders are "natural persons, SMEs or local authorities, including municipalities" who must be located in the proximity of the renewable energy project and effectively control it. 'Non-commercial' means that "the primary purpose of which is to provide environmental, economic or social community benefits for its shareholders or members or for the local areas where it operates, rather than financial profits" (European Union 2018). This is why this paper also refers to RECs as bottom-up, citizen-owned or community-led energy projects.

The definition of CEC is not employed in this framework because that would increase the complexity of this analysis beyond the scope of this research. Nevertheless, to provide greater clarity to readers, there is value in explaining the differences between a CEC and a REC. The main differences are that members do not have to be in the vicinity of the project, members are not necessarily limited to one vote, any size entity can be involved and that the electricity generated does not have to be renewable. Still, both REC and CEC are non-commercial legal entities whose members cannot be energy companies (Roberts 2020; Lowitzsch, Hoicka, and van Tulder 2020).

3.3   Activity, legal entity and TCSC

The distinction between a 'legal entity' and an 'activity' in the CEP is not immediately clear but bears importance. RECs and CECs are legal entities that allow its members to collectively engage in a variety of activities such as energy generation, self-consumption, distribution, e-mobility, energy efficiency, heating & cooling systems, etc. Individual activities can however be performed by other entities (European Union 2019; European Union 2018; Frieden et al. 2021).

The CEP allows for "jointly-acting self-consumers" who are "a group of at least two jointly acting renewables self-consumers located in the same building or multi-apartment block" (European

Union 2018, Article 2(15)) to take part in self-consumption without necessarily needing to set-up a legal entity i.e. a REC or a CEC. TCSC falls in this activity, it is defined as consumers who "generate renewable energy, including for their own consumption, store and sell their excess production of renewable electricity, including through renewables power purchase agreements, electricity suppliers and peer-to-peer trading arrangements" (European Union 2018, Article 21 (2a)). In this research, TCSC refers to collective self-consumption facilitated by a third-party (energy company), although collective self-consumption can also occur without third-parties.

3.4 The enabling framework

The CEP mandates MSs to provide an enabling framework for citizen-led energy projects. It must lower barriers while allowing conditions for fair competition i.e. a level playing field between all market participants, including new entrants and vulnerable groups (Lowitzsch, Hoicka, and van Tulder 2020). Article 3 of the 2019 recast internal electricity market directive stipulates that MSs shall ensure that national regulatory frameworks promote "competitive, consumer-centered, flexible, and non-discriminatory electricity markets" (European Union 2019). The 2018 recast renewable energy directive prevents citizens from being "subject to unjustified or discriminatory conditions or procedures that would prevent their participation in a renewable energy community". This entails removing "unjustified regulatory and administrative barriers" (European Union 2018, Article 22; Article 22(1)). Such measures can include regulatory, financial, or technical support to overcome barriers and foster a level playing field (Lowitzsch, Hoicka, and van Tulder 2020). It is therefore a matter of EU law that RECs perform activities on an equal footing with other market participants. The enabling framework for REC constitutes all measures that lower barriers in access to, participation in, and integration of community-led business models in the energy market.

3.5 The Energy Justice Framework

3.5.1 Intermediation in competitive markets and civil networks

Heldeweg, and Saintier (2020)'s valuable contribution argues that the CEP marks a sociolegal "shift" (10) in the energy transition which "recasts the relationship between state, market and society along associative governance principles" (2). All kinds of actors are incentivised to combine and mediate the policy objectives set-out by the CEP.

On this basis, the authors develop a framework which integrates the legality of the definitions included in the CEP with energy justice. The intermediary actors involved in the energy project this research chose to study operate at the institutional nexus between a "civil network" and a "competitive market" (4). They are likely to deliver unique characteristics of energy justice found at this intersection. The authors define competitive markets as institutional environments which "combine exchange relationships with the pursuit of private interests. They are environments featuring the market mechanism of consensual exchange in a competitive context, within safeguards for consumer protection and fair competition" (4). A civil network is defined as institutional environments which "combine collaborative and sharing relationships with the pursuit of social or community interests. They are present themselves through voluntary civil society, not-for-profit collaboration, in co-productive or sharing networks, with safeguards for social inclusion and non-discrimination of not-for-profit services" (Heldeweg, and Saintier 2020, 4).

Intermediary actors operate inside of these institutional environments. Kivimaa et al. (2019) provide a definition of intermediaries as actors "that positively influence sustainability transition processes by linking actors and activities, and their related skills and resources" (111). This definition underpins intermediaries as actors mediating decentralised energy systems. The authors make a

distinction with regime-based intermediaries as actors established in the prevailing socio-technical regime but who have identified incentives to pursue a transition pathway (Kivimaa et al. 2019).

3.5.2 Recognitional justice

The field of energy justice understands recognitional justice in energy governance as the identification of groups that are disproportionately or unfairly affected by decisions (Jenkins et al. 2016). In the CEP, this relates to channelling the benefits of participation to the groups identified in the piece of legislation: "natural persons, SMEs and local authorities" and "all consumers, in particular those living in low-income or vulnerable households", receiving equal treatment (European Commission 2018, Article 2 (16b); Article 22 (4f)). Local community participation must be "voluntary" (Heldeweg, and Saintier 2020, 7), which means that participation is open to all potential local members, without discrimination (Roberts 2020). Actors operating in competitive markets tend to recognise clients and company shareholders as the rightful groups to answer to. Whereas in civil networks, actors tend to recognise communities and their participants (Heldeweg, and Saintier 2020).

Recognitional justice serves to legitimise the groups that can lay a rightful claim on the next two justice tenets: procedural and substantive justice.

3.5.3 Procedural justice

Procedural justice or fairness in decision-making requires that the people affected by decisions should be equally involved in the very processes which lead to decisions being taken (Jenkins et al. 2016). In the CEP, Helderweg, and Saintier (2020) argue that this requires that effective control is exercised by members located in the proximity of the renewable energy project. This group should exercise autonomy or the opportunity to resist excessive control by a single member when making decisions irrespective of socioeconomic background (7). To guarantee that communities maintain

effective control, single members or third-parties must either keep to an ownership ceiling of 49% or sign a binding agreement which guarantees fair voting conditions. Control is defined as contracts which guarantee the "right to use all or part of the assets of an undertaking" and confers voting powers to members (European Commission 2019, Article 2(56); Lowitszch 2019, 6). In civil networks, agreements are collective and consensual whereas competitive markets usually consult clients but confer voting powers to shareholders (Heldeweg, and Saintier 2020).

3.5.4 Substantive justice

Distributional or substantive justice is interested in the spatial dispersion of the costs and benefits relating to rolling-out decentralised renewable energy (Jenkins et al. 2016). Heldeweg, and Saintier (2020) argue that the package requires purposeful projects that provide "environmental, economic or social community benefits for its shareholders or members" in the locality of the project, rather than financial profits (European Commission 2018, Article 2(16c)). Benefits must be created "at the lowest cost" to members and be distributed proportionally between members (7). Actors operating in competitive markets deliver substantive justice by providing competitive services to consumers but also through "reciprocity" (6). Reciprocity occurs when competitive market actors address the costs incurred to create benefits, either immediately or in the longer term, by redistributing benefits to those who incur larger costs and are not necessarily directly their clients or shareholders. In civil networks, substantive justice is characterised by collectively sharing the benefits and burdens between members.

The design of support schemes bears relevance for substantive energy justice. RECs must compete on an "equal footing with other participants" by taking "into account [their] specificities" (European Union 2018, Article 22(7)). Therefore, competition for support mechanisms must be fair and transparent to support substantive justice.

3.6   Corporate Capture

This theoretical framework would be incomplete without defining the concept which can guide the discussion on companies selling TCSCs as attempts to capture the more transformative notion of an 'energy community'. Pel (2016) hypothesises that corporate capture occurs when weak actors wage transformative innovation attempts. Powerful actors with ambitions that are not necessarily transformative, twist the attempt at transformation by suggesting solutions that the initiating actors find "perverting" (674). In this process, both sides absorb domesticating and radicalising features, and the meanings of their solutions evolve. In other words, capture moves transitions forwards, the end result may still develop further and lead to the same outcome.

Because Pel argues that capture occurs over time. It is important to place energy decentralisation in Portugal in "pre-development phase" (Scharnigg, and Sareen 2023; Kivimaa et al. 2019, 119). In this phase, intermediaries are learning from connecting new actors and experimenting with business models. Powerful intermediaries can lock-in early changes in regulatory institutions (Kivimaa et al. 2019).

4. Methodology

4.1   Case selection

The Bicesse kindergarten project is developed by a subsidiary of the Greenvolt Group: Greenvolt Comunidades. The project resembles a TCSC, however it benefits from Greenvolt's Share, Talk, Offer, Protect program which aims to support at least 1 social/environmental institution per year with an "inclusive energy community". By 2030, their goal is to support "250,000 vulnerable households" (Greenvolt, n.d., B).

Its relevance to the research topic is motivated by the fact that it has been used as an example, among others, as a best practice for energy by a coalition of European interest groups to shape the

revision of the 2024 internal electricity market directive decentralisation (e.g. during the 15th Citizens Energy Forum: Break-out 2, see: Pereira 2023), soon to be fully published (Widuto 2024). Moreover, because the kindergarten is part of a corporate social and environmental responsibility program, it is representative of how actors operating in competitive markets deliver on energy justice.

4.2   Data Collection Method

4.2.1   Semi-structured interviews complemented by secondary source material

Due to the lack of secondary sources which could provide answers to the research question. The aim of the data collection method was to enhance the information available, provide new details or reach out for views that are not yet publicly available (Alshenqeeti 2014). A statistical approach was therefore not appropriate, whereas interviewing adequately addressed these research aims.

Researchers often times do not know what they do not know before articulating their research design. Interviewing is a highly adaptable data collection method appropriate for research designs where results are also conditioned by unforeseen social factors with the interviewees themselves. Interviewing has unique data collection characteristics which combine deductive and inductive traits. It is therefore not necessarily a linear method but can follow a succession of cycles (Brinkmann 2013). The researcher prepared interview guides ahead of time to confirm hypotheses or generate new insights. The interview guides reflected the academic state of the art and the areas that interviewees had knowledge in. These were semi-structured, allowing necessary topics to be explored in greater depth but giving space for interviewees to provide new ideas, or for unexpected conversations to happen (Alshenqeeti 2014). The interview guides intentionally probed further clarity on existing knowledge or for new insights. For instance, time was systematically given to interviewees before the end of the interview to raise issues of concern, comments or questions.

The interview guides were tailored to interviewees, a distinction was made between 'elite interviewees' who can offer expertise or data on influence and power. And interviewees whose purpose was to share their lived experiences (Beyers, Braun, Marshall, and De Bruycker 2014). They offered insights into their individual agency, the benefits and challenges they face within TCSCs (Schelly 2016).

Interviews shun light on underappreciated pieces of evidence and sometimes elicited further research. The researcher allowed participants to clarify or modify transcripts to guarantee representative results. It also allowed for participants to recommend other interview participants. The results of the interviews created the necessity to consult secondary sources, both to provide clarity on primary sources and to guarantee the integrity of the data. The approach was therefore reiterative, the researcher refined the method as evidence unfolded until reaching a dataset which satisfactorily provides answers to the research question.

4.2.2   Target population and sample

To guarantee that the research measures what it intends to measure, the target population were stakeholders with direct knowledge of, or interest in, the case study, at several levels of governance (community, state and EU level). Because social factors shape the data interviewees are ready to reveal (Alshenqeeti 2014), and because interviewees exhibit different forms of knowledge (Crawley 2021). The sampling strategy needed to involve different kinds of stakeholders to complement the interviewees' areas of knowledge and help the researcher triangulate evidence. Those stakeholder groups were Greenvolt Comunidades employees, civil society and community members.

The sample visible in *table 1* allows the research to reduce the units under observation to a sizeable yet manageable amount. The researcher successfully surveyed participants who could contextualise the case at all three levels of governance. Civil society was successfully sampled

represented by journalists, grassroots environmental justice movements, academia and members of intermediaries operating in civil networks. The sample evenly includes participants representative of all three levels of governance. Nevertheless, the sample is not entirely representative of the target population. It could have included other representatives of the energy company. It could also have surveyed vulnerable groups directly.

Table 1: List of interviewees

A1 – European sphere	Two people videocall (35:00) on 24.04.2024	Investigative journalists working on cases of 'corporate capture' of renewable energy communities in the EU
A2 – European sphere	One-on-one interview (1:07:00) on 26.04.2024	Energy community campaigner with strong ties to Portugal working on energy communities at a European not-for-profit advocacy group
A3 – Portuguese sphere	One-on-one interview (53:00) on 02.05.2024	Lead Portuguese researcher in renewable energy communities. High ranking staff member at a civil

		network intermediary in Portugal.
A4 – Portuguese sphere	1. One-on-one interview (01:10:00) on 07.05.2024 2. Two-follow up questions addressed by email	Renewable energy community researcher and REC pioneer in Portugal
A5 – European, Portuguese and case specific	One-one-one interview (01:36:00) on 06.05.2024	Head of regulatory affairs at the company developing the kindergarten project.
A6 – Case specific	One-on-one interview (52:00) on 11.05.2024	Energy community researcher who has visited the kindergarten project.
A7 – Case specific	1. Three-on-one meeting (56:00) on 09.05.2024. 2. Two follow-up questions by email 3. Release of two documents produced by Greenvolt on	The meeting was held with the director of the kindergarten, the director of the not-for-profit who owns the kindergarten, and their advisor.

	energy consumption and cost savings.	

4.2.3   Interviewing Protocol

Recruiting participants was made on a voluntary basis via email. In some cases, preliminary online meetings or calls were held with potential interviewees to guarantee their full informed consent. All interviewees were presented with release forms before the start of the interview which guarantee the use of the transcripts in this paper. The interviewing protocol differed with A5 who postponed signing the release form until after having retracted parts of their transcript. After reviewing the transcripts of A3, A4, A5, and A7, follow-up questions were addressed by email. Only A4 and A7 answered, their response was integrated into their transcripts. A7 further provided two additional documents produced by Greenvolt on the energy consumption of the project and the financial savings which was also integrated into their transcript. The audio recordings were made using a phone except from the online interview with A1 where audio was recorded via Zoom.

All raw primary data files were kept on a separate hard drive. A first round of transcriptions was performed using the AI integrated into Adobe Premiere Pro on the researcher's own laptop. A second round of transcriptions was performed manually. These measures guarantee the privacy of the data.

4.3 Method of analysis

A coding analysis was then applied to the data that was collected using Microsoft Word. The goal of a coding analysis is to facilitate the analysis by using several techniques which select segments of texts and provide structure to the dataset. It entails making systematic distinctions for fragments of text. Then, making sense of these distinctions by making meaningful categories (Alshenqeeti 2014). These distinctions are also called codes. They can be derived from issues raised by the text itself or from patterns that occur in the data but are deduced from the literature. *In vivo* codes are inductive codes derived directly from the participants' own words (Hennink, Hutter, and Bailey 2011).

The coding process followed Boeije (2009)'s recommendation to first perform several rounds of open coding. This process familiarised the researcher with the data, it entailed temporarily generating labels for segments of texts. This process was mostly inductive, although some codes were deductively generated at this stage. The codes were eventually refined as patterns began to emerge and redundant ones were streamlined. After the open coding, codes that complement each other were grouped into categories. In this step, the researcher started to incorporate the theoretical framework to cluster codes. Eventually, overarching themes were identified in order to give structure to the dataset ahead of the analysis. The process of organising data as such created code trees which give a comprehensive overview of the results. These trees are presented in the results chapter and their codes are marked with '(I)' representing inductive codes, '(D)' for deductive codes and '(*iv*)' are *in vivo* ones.

4.4 Ethical considerations

There were ethical challenges in ensuring that the research does not exploit or harm the vulnerable communities being studied. The researcher was aware of inherent power imbalances between himself, and the vulnerable community. Because it is part of the research design to sample a

variety of stakeholders, it was necessary that participants agree to releasing their job title in the framework of this research. Of course, releasing their job title exposes participants to being identified by other stakeholders in the field. Breaching sensitive information between interviewees could compromise ongoing and future partnerships or opportunities, resulting in social hazards (Lancaster 2016).

This risk was mitigated by fully informing consent, participants were made aware ahead of the interview, in the release form, that their job title would be released. Professionals understand this to imply that they should not speak further than the extent to which their anonymity is guaranteed. At the start of every interview, participants were asked topics may be 'taboo'. They were then encouraged to go 'off-the record' when they did not wish information to appear under their job title. The non-professionals who agreed to participate in this research might not fully have fathomed that the information they release could be tracked by other stakeholders. For this reason, the researcher took into consideration the vulnerability of such participants and kept their material well-being in mind.

Finally, to avoid contributing to the marginalisation of already marginalised voices. It was important that the perspective of weaker groups (in civil networks) was genuinely represented without being overshadowed by the views of powerful actors.

4.5   Limitations

4.5.1   Positionality

The researcher's own positionality may bias how the results are collected and presented. All researchers exhibit biases in the theoretical choices they make. Inquiring about corporate capture or the energy justice potential of the business model is a normative choice in of itself. Researchers making different theoretical choices may garner different results.

The researcher declares that power imbalances inherent to "studying-up" (3) could have provoked biases in the result (Lancaster 2016). First, many interviewees in the sample had more experience and expertise in the field than the researcher. They could have pushed a narrative in the interviews without the researcher being aware. Second, getting into contact, and gaining the trust of participants is dependent on the researcher's own network and prior experiences. This may have created an interviewee selection bias beyond the researcher's control. This reduces the reliability of the results.

4.5.2 Sample

Elite interviewees usually commit to an official line shaped by the institutions they subscribe to. They can disallow engaging with more interviewees from the same institutions as spokespeople are often selected (Lancaster 2016). This was the case with Greenvolt Comunidades, the researcher reached out for several interviewees but the company assigned one spokesperson to represent their views resulting in a small company sample, yet representative of their views.

However, the researcher could have sampled representatives of other companies selling TCSCs to garner results more representative of all companies selling TCSCs. Elite interviewees remain difficult to gain access to (Beyers et al. 2014). This research project was limited in time and network, reducing the external validity of the results.

Regarding the community members, although a request was made to gain access to the vulnerable groups targeted by Greenvolt in the kindergarten project, the researcher only gained access to senior staff members at the kindergarten. This reduces how representative the sample is of the target population. In turn, this reduces the internal validity of the results.

4.5.3 Research design

Unlike quantification where methods are usually systematic and replicable, the downside of interviewing and coding analyses are their malleability. They have been criticised for lacking reliability. In fact, researchers do not systematically replicate steps made by other researchers (Brinkmann 2013). To address this criticism, this chapter clarifies the most important choices made which affect the results. Nevertheless, the researcher made an overwhelming amount of tacit choices throughout this research project that cannot all be fully accounted for, reducing the reliability of the results.

The research design narrows into a case study, it is therefore bound by its context. Companies using the TCSC business model share many similarities but also exhibit many differences. This reduces the ability of this research to generate insights that are externally valid or generalisable. This limitation is addressed to some extent in the results chapter by making it explicit when it is unclear whether other companies share features of the business model.

Access to the energy contracts of members was first authorised by A7 then retracted. This data could have provided a more accurate estimation of the distribution of costs and benefits resulting from TCSCs. The lack thereof increases reliance on qualitative data which reduces the reliability and the internal validity of the results.

5. Results
5.1 Chapter overview

The coding analysis identified codes which were clustered into six interconnected overarching themes which are presented in figures at the start of each subsection. When secondary sources were consulted to triangulate data, these are explicitly cited. The first theme is named 'companies selling TCSCs'. It provides greater detail on the governance and business model of energy projects developed

by competitive market intermediaries i.e. companies selling TCSCs. The second theme is 'the kindergarten project', this theme presents all codes that are of direct relevance to the specificities of the case study. The first two themes converge in the sense that even though the 'the kindergarten project' is a large theme, it should be understood as one application of the business model, and therefore approximates to a sub-categorisation of the first theme.

The next four themes centre around grouping codes that describe the wider issues within which the case can be understood. The third overarching theme builds on the theoretical framework to describe the enabling framework for TCSCs and RECs in Portugal. It clusters mentions of barriers communities face that intermediaries help address. The fourth theme probes in further depth the costs and benefits that TCSCs generate for its members under the current enabling framework, relative to RECs. The fifth theme englobes all codes which describe the dynamics of the market for TCSC. The last theme clusters codes that could be structured based on the theoretical framing of corporate capture.

5.2 Companies selling TCSCs
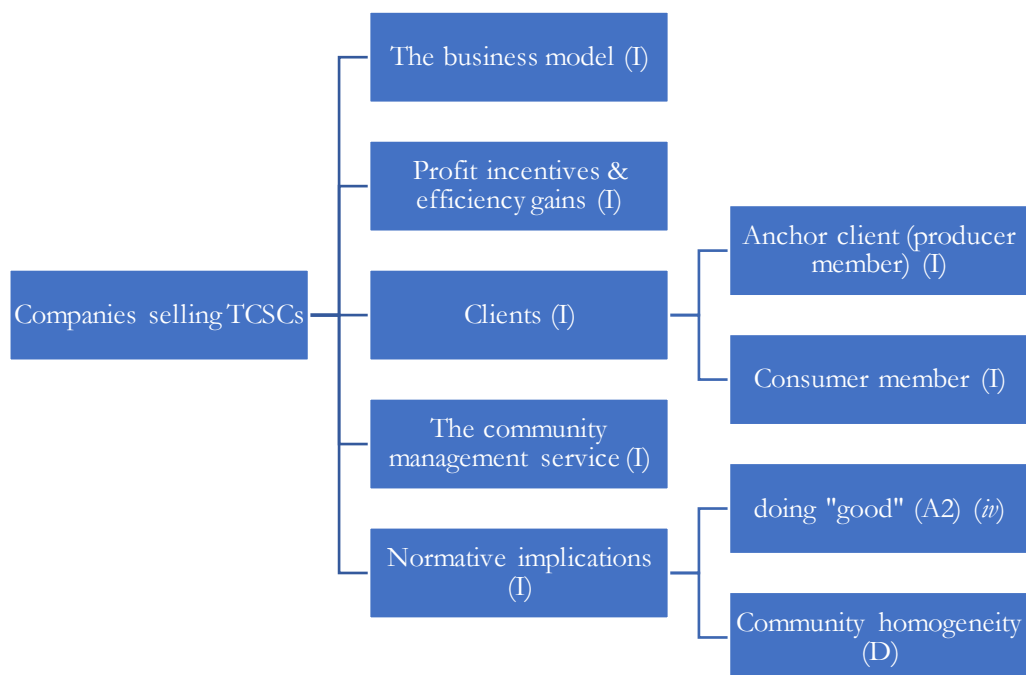
Figure 1: code tree of 'companies selling TCSCs'

Figure 1 creates an overview of the codes representative of all companies selling TCSCs in Portugal. It is mostly coded from the interview with A5, although information was triangulated with other interviewees and secondary source material.

In Portugal, since decree law 162/2019 came into force on January first 2020 (European Commission 2021), there have not been any restrictions regarding the ownership of assets in collective or individual self-consumption projects (Pereira 2023; SolarPower Europe 2023, 25), allowing competitive market intermediaries to experiment with the business model as soon as the first attempt to transpose the CEP was made.

The business model centres around signing a PPA (Power Purchase Agreement) with an anchor client. A5 thinks "it can go 10-15 years, it could be more" whereas A7 reports a contract length of "about 20 years. But I don't know" (A7). There remains a lack of clarity over the length of these

contracts. The price charged by the company reflects the costs of the installation, the grid access tariffs, the VAT, the investment risks and the desired profits (involving "a market analysis of" […] "the rates which are being offered to this consumer" (A5)). Once the contract is signed by the anchor client, the company registers itself as the 'entity that manages the self-consumption project'.[2] This is a "light" legal title which is easily registered and receives a tax number (SolarPower Europe 2023, 27). It grants effective control over the project to the competitive market intermediary. At the end of the PPA, the anchor client gains the ownership and effective control of the project. In the case of Greenvolt Comunidades, the contract includes a 'buy-up' clause: after a few years the anchor client can preclude the contract by buying-up the installation ("with a certain rate of return"(A5)). This provides greater flexibility to anchor clients. It is unclear whether all companies selling TCSCs provide a 'buy-up' clause.

The PPA takes risk out of making an investment in decentralised renewable energy generation by guaranteeing a price even if the levelized cost of generating solar energy goes down. Furthermore, to maximise the profits of a PPA, competitive market intermediaries are incentivised to harness economies of scale and deliver efficient services. A5 explains that companies selling TCSCs maximise profits by scaling rooftop installations to collective rather than self-consumption. The rate of return therefore grows with the size of the flat rooftops. The more energy generated, the more can be sold to the anchor client and surrounding consumers. This approach harnesses the PV installation's economy of scale in urban contexts, particularly when efficiency gains in PV generation market are continuously made by moving towards larger and larger wafer technology (Chunduri, and Schmela 2021). Therefore, companies selling TCSCs reduce risk with PPAs, harness economies of scale and gain most benefits by selling TCSCs to owners of (several) large rooftops.

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[2] Translation from 'Entidade Gestora do AutoConsumo' (commonly referred to as EGAC) by the researcher.

Companies selling TCSCs try to pair two types of clients who exhibit complementary consumption profiles, this avoids feeding excess energy to the grid. They both maintain their contracts with their existing energy supplier and sign onto a second contract with the company selling the TCSC. They are both charged what is metered minus what was consumed from the project, at a fixed rate. They however have different contractual rights and obligations. The anchor client (also called producer member) signs the long-term PPA with the energy company. It owns the large flat rooftop and will self-consume the greatest chunk. This client is charged "a fixed rate, which represents a significant discount at that time compared to what they paid to their supplier" (A5). In consultation with the energy company, the anchor client can decide who to share with, they can also pay a higher rate to offer discounted rates to consumer members.

The consumer member is located in the vicinity of the project, "basically without doing anything, they are just paying a lower fee for the electricity that they are consuming compared to the supplier" (A5) but never gain ownership of the installation. As opposed to the anchor client, they are offered short-term contracts (usually 1 year to start with). Hence, anchor clients gain more benefits (e.g. ownership and greater control) from a TCSC project than consumer members but consumer members face similar (or higher) costs per kilowatt-hour (kwh).

As a result of exercising effective control of the project at least for the duration of the contract, the competitive market intermediary provides a community management service to the anchor client, it makes itself responsible for "building the consumers" (A5): signing on and maintaining the sharing contracts with the consumer members. The competitive market intermediary also makes itself responsible for communicating consumption coefficients to the distribution side operator. Part of the community management service includes providing an energy sharing app to members where they can track the rate at which energy is self-consumed or shared and with whom. This app can inform individual decisions on energy, which can be considered to offer a form of participation to members.

Once the PPA ends, the company continues to offer the community management service although the anchor member who now has effective control of the project can choose otherwise: "they could pay us a management fee to continue to do that" […] "But what I can tell you is that according to our models, this should be possible and should make sense" (A5).

Selling TCSCs rests on two ideas, the first being that fostering decentralised renewable energy projects top-down creates benefits from improved efficiency. The community management service reduces the social complexities of community-led initiatives. Here, interviewees refer to the sale of decentralised energy generation, assuming some level of intra and inter community homogeneity. In fact, interviewees often refer to TCSCs in opposition to bottom-up approaches: "a company representative once said in a conference that they are 'selling energy communities' and I answered that 'energy communities are not for sale, they have to be built'" (A3).

The second being that businesses can make money out of 'doing good' things. Here, interviewees recognise that companies have the knowledge and financial resources to decentralise the energy system while pursuing profit: "Again, I do feel that they have a role to play" […] "'businesses are starting to wake up and see that there's actually a good impact that you could make and also make some money out of it'" (A2).

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5.3   The kindergarten project
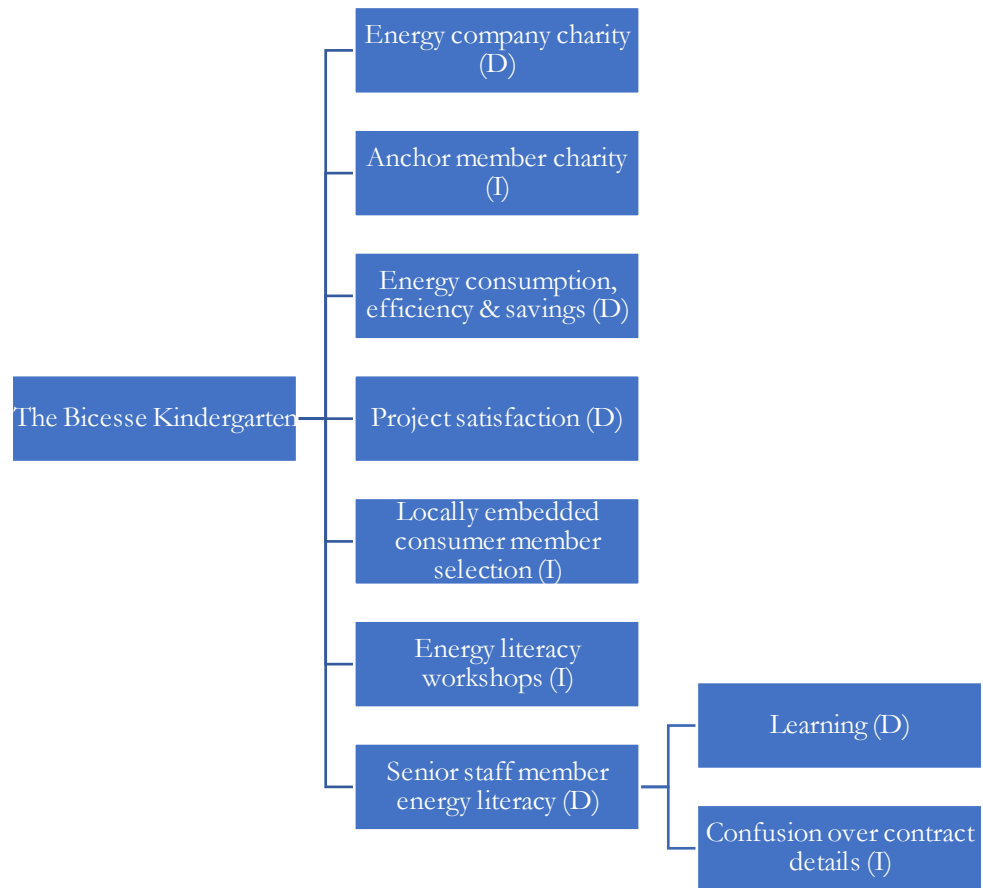
Figure 2: code tree of 'the kindergarten project'

Figure 2 shows a comprehensive overview of the codes discussed in this subsection. The kindergarten project is based on a TCSC but it exhibits specific features to do with the charity program it is part of (i.e. the 'inclusive energy communities' program within the 'Stop, Talk, Offer, Protect' program). A7 reveals that the kindergarten project was initiated top-down, Greenvolt looked for an institution of social purpose in a social housing neighbourhood and got into contact with the owner of the kindergarten: Santa Casa da Misericordia da Cascais (SCMC). SCMC, is a non-profit institution which receives public and private funding to provide kindergartens to lower-income groups.

In the inclusive communities program, the company reduces its profit margin and it does not

charge the inhouse expertise necessary to develop and manage the project amounting to a total of 10,000 euros: "the inclusive communities program is supposed to be a social and environmental responsibility program. Which means that the company is diminishing its profit margin and offering special and more beneficial conditions to, for instance, social welfare entities" (A6). The exact amount of the Greenvolt voucher in the case of the kindergarten remains unclear. A5 explains that Greenvolt has "almost 100 energy sharing projects [(TCSC)] and three inclusive energy communities". There is therefore an important difference between the space that the 'inclusive energy communities' program takes as opposed to the core of their business.

SCMC, as the anchor member, chose to offer a greater discount to consumer members by paying a higher PPA price to the energy company: A5 "even though it is a much lower price than what [SCMC] pays before the project, nevertheless, [SCMC] could even pay for a much lower price if [SCMC] was not providing other families". Therefore, SCMC provides additional charity which enhances benefits for the vulnerable groups involve. However, anchor member charity i.e. providing greater discounts to consumer members, is not a systematic part of the inclusive community offer.

Documents produced by Greenvolt but retrieved from A7, reveal that the project has an installed capacity of 71,94 kilowatt power[3]. SCMC pays a fixed rate per kwh it self-consumes. The kindergarten consumes approximately 55% of electricity from Greenvolt's installation and 45% from the main energy provider in Portugal: EDP, saving approximately 1.300 euros per year. The project creates savings that SCMC can reinvest in the kindergarten offer, to the benefit of the vulnerable families: "our service institutions are always looking for money for food, toys, some things. If you don't spend electricity, we can spend on other things" (A7).

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[3] This is the kilowatt power at peak efficiency.

The consumer members were selected by the anchor member using criteria of economic and social vulnerability in consultation with the energy company: "[Greenvolt] installed everything, and [SCMC] had full ownership of deciding where to donate or where to provide the energy with very low prices" (A5). SCMC chose to share with 7 households of parents from the kindergarten and 3 households of workers at the kindergarten. Because the kindergarten is embedded in the community, it is trusted and easily identified consumer members. A7 claimed that the anchor/consumer member relationship increases a sense of solidarity in the community.

Of the energy that is generated on the roof, between 69 and 83% is shared virtually with the families or fed back to the grid. Virtual sharing is a real-time energy accounting technique which allocates energy using the public grid (Directorate-General for Energy 2024, 5). The kindergarten consumes energy on weekdays, especially between six in the morning and four in the afternoon, leaving excess for late afternoons and weekends. This exhibits complementary consumption profiles which enhances energy efficiency. Greenvolt estimates that this project helps the 10 consumer member families, save 78 euros per year per household on their energy bill compared to the original supplier.

After inaugurating the project, Greenvolt offered workshops on two different days to increase renewable energy literacy among kids and their parents: "they were here and explained to the children how it works. And even today, when they go with parents, they are always looking for PV on other rooftop buildings. Because they understand. This is important for the planet" (A7). Videos of the workshops feature on the company's website (see: Greenvolt, n.d., A). So far, it is not planned to repeat the workshop. Overall, this translates to A7's strong sense of satisfaction with the project: "I am happy with this project because I think children and families win a lot with this". Generally speaking it can be said that Greenvolt successfully reaches out to a group that would not otherwise have access to decentralised renewable energy. A7 reflects this notion: "You know, we have a lot of

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work. We cannot..."[…] "It's Greenvolt that does everything. Yeah. Which is nice"[…]" Our work is not electricity. It's families".

During the interview, senior management reported on their low level of energy literacy at the start of the project: "Greenvolt contacted us and they said to me, 'we want to have panels inside of this house.' And I said, 'I know nothing about energy, about what you are telling me. I know nothing'" (A7). Beyond the workshops given to parents and children of the kindergarten. A7 reported no learning outcomes. In terms of fostering collective changes, the anchor client does not report making any changes in the community: "We work as usual. We don't make nothing different" (A7).

Moreover, the staff at the kindergarten did not make use of the energy sharing app i.e. they had no knowledge of the generation and sharing data which limits their knowledge of solutions that could enhance the complementarity of the consumption profiles. In the A7 interview transcript, the code 'confusion over contract details' is quite dominant. The senior staff members were unaware of most contract details and could not explain specific features of the offer. For example, they were unaware that they maintained a second energy contract with EDP.

This overarching theme makes it clear that the kindergarten project does not form part of Greenvolt's core business. It is part of a targeted charity program, it provides social, environmental and economic benefits to its members. The selection of members was open to vulnerable groups in the vicinity of the project. There are no collective learning outcomes which reduces the benefits that the project makes available.

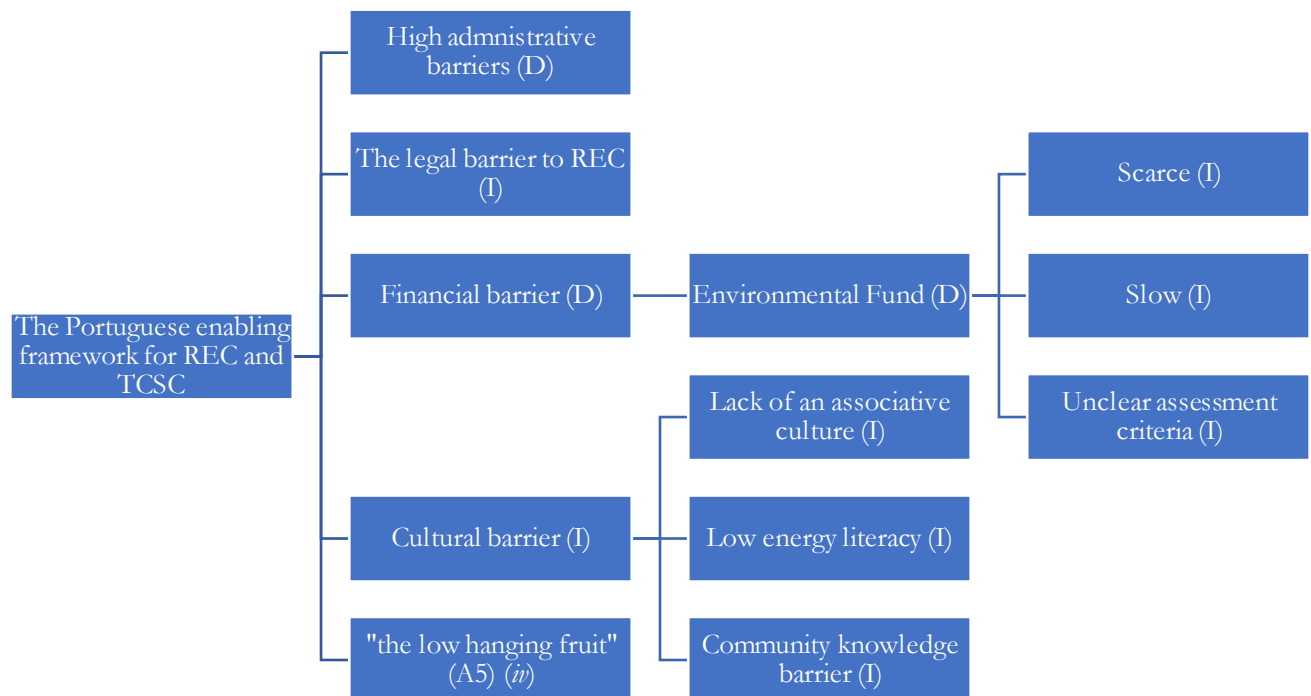## 5.4 The Portuguese enabling framework for REC and TCSC in Portugal

Figure 3: code tree of 'the Portuguese enabling framework for REC and TCSC'

The interview guide inquired about the transposition of the CEP's enabling framework for RECs and how it compares to TCSC. The resulting codes are presented following the structure of Figure 3.

Interviewees described a systemic lack of government involvement which resonates with the findings from Scharnigg, and Sareen (2023). Important administrative barriers remain: government agencies lack dedicated personnel to facilitate the process and redundant bureaucratic steps result in a complex process higher than in other European countries: "the framework, it was so impossible to navigate" (A3).

A topic of central importance was the 'legal barrier' to forming a REC compared to setting-up a collective self-consumption project. Because a REC requires the creation of a legal entity (e.g. association or cooperative) to make invoices between members, this requires more administrative processing time and money for applicants. As a result, this barrier disincentivises citizens from setting-up an REC.

The 'financial barrier' was brought-up multiple times. The low-income context of Portugal heightens barriers for citizens who want to invest in their own installation. In the enabling framework, public subsidies are meant to lower the financial barrier, especially for lower income groups. The Environmental Fund[4] allows collective self-consumption projects (incl. TCSCs) and RECs to apply for funding. It is described by interviewees as slow: 145 applications were submitted in February 2023, applications started being processed in April 2024, the results should be published between June and July. The funding is scarce: 19 out of the 30 million available will be allocated. It did not provide details over the assessment criteria. At this stage, it is still unclear whether it will be given out indiscriminately or on the basis of need.

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[4] Translated by the researcher from 'Fondo Ambiental'

The 'cultural barrier' was an unanticipated issue raised by interviewees, it describes fragments of interviews arguing that there are unique barriers to bottom-up civic participation in Portugal. The 'lack of an associative history' refers to the historical scarcity of bottom-up civic participation. The low union density or the small amount of community associations were brought up as examples to support the claim. Interviewees also brought-up how low-income levels intersects with weak energy literacy in civil networks to form a barrier to bottom-up energy initiatives: "[Policymakers] think it's the better way because we are a poor country. We the citizens are not very educated or don't have so much information about energy" (A3). A3 further argues that in many cases, communities do not lack the funds that can be pooled, but communities lack the awareness of business models which can pool financial resources. It is therefore more of a cultural or community knowledge barrier than a financial barrier *per se*.

Several interviewees explain that energy companies find the definitions of REC/CEC too restrictive to work with. They prevent large companies from making a profit from asset ownership which restricts the rate at which decentralised renewable energy is rolled out in the absence of an enabling framework for community-led initiatives. TCSCs allow energy companies to activate space that would stay inactive: "the low hanging fruit" (A5) or "the comfortable solution" (A6). As a result, competitive market actors are successfully intermediating decentralisation while pervasive administrative, financial or cultural barriers remain due to government inaction.

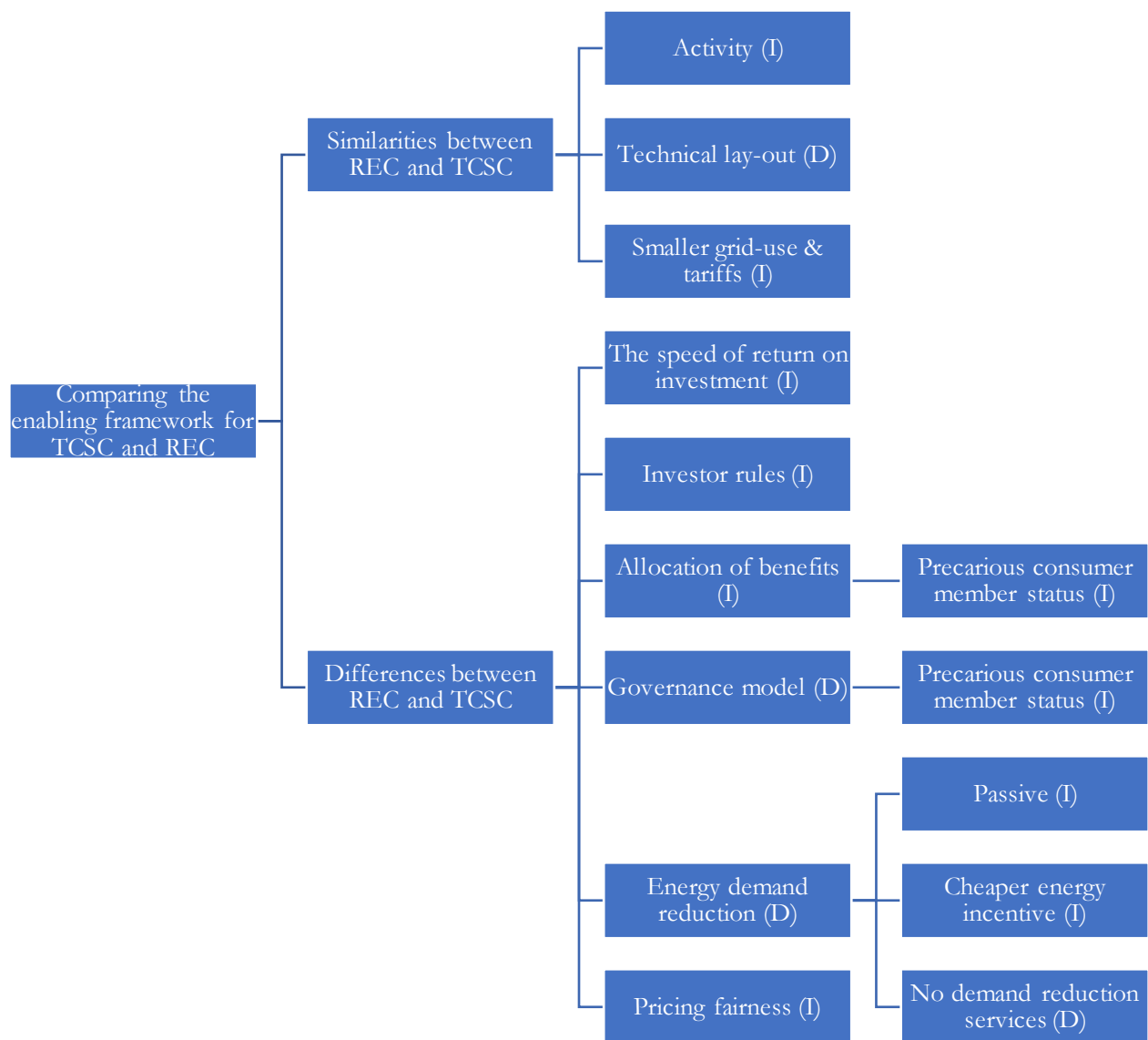## 5.5 Comparing the enabling framework for TCSC and REC

Figure 4: code tree of 'comparing the enabling framework for TCSC and REC'

Figure 4 clusters all the data which discusses how the regulatory framework enables TCSC or REC differently, fostering a different distribution of costs and benefits for potential members. In the first code 'similarities between REC and TCSC'. Interviewees explain that these two models share the same activity: generating decentralised renewable energy and sharing with the neighbourhood using virtual accounting techniques. When they perform this activity, they share the same technical lay-out and result in smaller grid use.

Interviewees claimed that both RECs and TCSCs receive the same regulatory benefits. Secondary sources were consulted for the purpose of clarification: the final energy price components for regular consumers in Portugal are estimated at 18.2% for VAT and 20.4% for the grid access tariffs (including the 'costs of general economic interests'[5]) (European Commission 2021, 19). Members of collective self-consumption schemes (both for a TCSC or a REC) are exempted from paying the 'costs of general economic interests' on the energy they consume from the project (European Commission 2021, 9). In a TCSC, anchor members generate a full exemption of the grid access tariffs on the energy they self-consume, however consumer members generate less of a discount on the grid access tariff because they continue to consume through the public grid. Their fees correspond to the voltage component where the consumption takes place, as opposed to a normal consumer who pays for all grid components (e.g. very high voltage, high voltage, medium voltage, low voltage) (European Commission 2021, 9; SolarPower Europe 2023, 15; REScoop.eu 2022). This incentive is estimated to reduce prices for members of collective self-consumption projects by 33% (11), however, European Commission (2021) does not make a distinction between anchor members and consumer members. Furthermore, the Decree Law 85/2022 published at the end of 2022 exempts members of TCSCs and RECs "from the payment of VAT associated with the sale of surplus electricity from self-consumption

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[5] Translated by the researcher from 'Custos de Interesse Económico Geral'

electricity production units with an installed capacity equal to or less than 1 MW" (SolarPower Europe 2023, 14). All in all, it can be said that TCSCs and RECs benefit from the same incentives although consumer members generate fewer regulatory benefits (based on the grid component(s) which allows for their participation).

However, in TCSCs, the energy company collects the benefits members create (the grid exemption tariffs, the VAT discount) and then decides to apply a price per member which reflects a profit margin. As a result, the speed of return on investment is slower for members of TCSCs as opposed to members of RECs, reflecting higher costs incurred by members of the former than the latter. A4 explains that "for someone installing their own PV systems and investing their own money, you always have a return. Because you do not pay the grid access tariffs. You do not pay VAT tax if you are consuming your own energy. You do not pay the retailer's profit margin. You do not pay for the losses of the grids. So if you are installing your own, you always get a return on investment. It depends a bit on these factors. But in 5-6 years in the best-case scenario, in 10-12 in the worst-case scenario, you get your return back." It can therefore be said that members of TCSCs incur higher costs than if they were part of RECs.

Because competitive market intermediaries control the price members pay in TCSCs, many interviewees brought-up the issue that allowing energy companies to decide on the price of energy members pays, contributes to commodifying energy which can create issues with pricing fairness. They raise the possibility that PPAs may become disadvantageous in the medium to long term. A2 claims that "companies will never offer you the fairest and cheapest price of energy" […] "you saw that clearly in the energy crisis." A4 explains that "one main concern is getting people locked in long contracts that they do not understand well" […] "because they do not know the evolution of the prices" (A4). To provide further clarity, the researcher attempted to gain access to contracts, but this was blocked. The issue of pricing fairness needs further research.

The allocation of energy occurs quite differently between both models, RECs usually share proportionally to investment and members usually invest equally among each other. All members gain ownership of the installation, and the costs and benefits of incentives are distributed equally (e.g. grid exemption tariffs). In a TCSC, the anchor client will consume the majority of the energy and therefore receive most of the discounted energy from the installation. Ownership is first limited to the energy company then to the anchor member. Therefore, most benefits concentrate with the anchor members whereas the consumer members never gain ownership and consume less discounted energy. It is also likelier that they collect a lower discount per kwh. A6 explains that this "contributes to reproduce a paradigm of private and concentrated property. And that's the opposite of energy democracy". In fact, the lack of ownership with consumer members does not address their substantive access to energy, they remain exposed to energy poverty, even after the contract comes to an end.

The ownership of a project shapes the governance model. RECs usually convene in general assemblies, every member gets one vote. All members, including vulnerable members have voting rights. The governance structure therefore more easily allows members to collectively decide to socialise risks vulnerable members face. Whereas in a TCSC, decision-making is concentrated in the hands of the energy company until contract end. The company makes decisions in consultation with the anchor client. The anchor client can consult the consumer members. Nevertheless, consumer members maintain a precarious status, they never gain voting rights (e.g. over the excess energy they use), even after the contract comes to an end. Consumer members remain exposed to the decisions of the owner of the project. For instance, if the energy company wants to optimise a process or if the anchor client changes industrial processes and consumes more energy. In the case that a consumer member fails to make a payment, A5 explains that: "we will have to terminate the contract and try to find another consumer in the neighbourhood which would receive that surplus energy". Therefore,

consumer members are not procedurally involved in TCSCs which exposes them to fewer benefits for the same or higher costs from TCSCs compared to anchor members.

The kind of participation TCSCs foster do not necessarily contribute to collectively designing demand side solutions. Participation equates to signing a contract, this is limited to making a cost-benefit analysis of a service that is being offered. Cheaper energy does not necessarily incentivise energy demand reduction (it may even be the opposite). The service does little for enhancing people's energy literacy. It also does not incentivise behaviour that empowers citizens to be active in their community and think of other long-term measures to collectively reduce energy consumption. Moreover, competitive market intermediaries selling TCSCs do not sell services which reduce energy consumption: "I don't believe that we have deployed any type of energy efficiency measures" […] "this is something that we have to evolve. And of course, if we are not reducing demand, that is fair [criticism]" (A5).

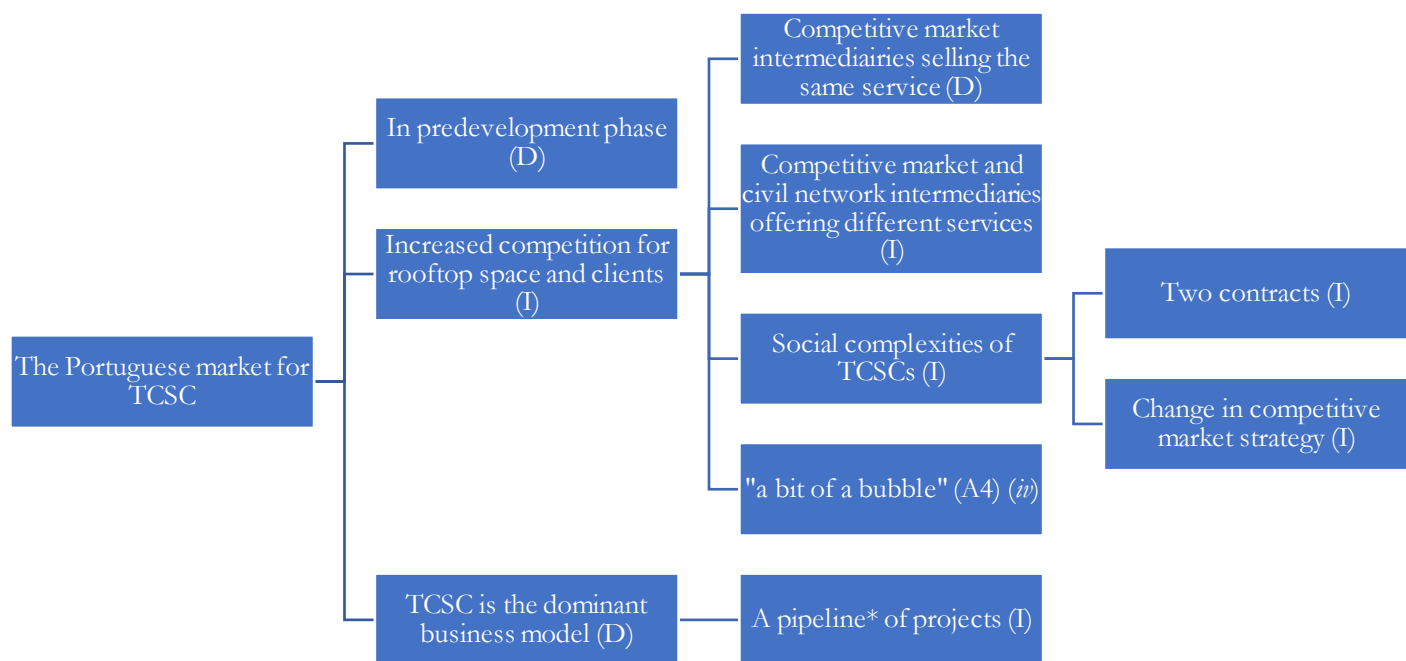## 5.6   The Portuguese market for TCSC

Figure 5: code tree of 'the Portuguese market for TCSC'

Figure 5 encapsulates all the codes which describe the market dynamics for TCSCs. The first code of the theme was coded deductively, it describes how business models to decentralise energy generation are in a pre-development phase. Civil network and competitive market intermediaries are both testing their business models and learning from experiences: "It's not yet generating net profit. I mean, it's still in the phase where we are investing and so on" (A5); "We are still waiting to see if it works as we expected or not" (A4).

The popularity of the TCSC business model has increased the competition for rooftop space and clients in Portugal. A4 explains that "this is about reaching the rooftops first. So, the companies when they are able to get the project working, they secure it for the coming years. So, it's also a long-term perspective of having this portfolio of projects". This competition occurs between competitive market intermediaries offering the same service. This competition also occurs between models where the offer is different. Civil network intermediaries offer a participatory service where after a one-time investment, members no longer pay the electricity they self-consume. Whereas to join a TCSC, there are no upfront costs but immediate savings on the energy bill.

Interviewees describe a situation where there has been a rapid escalation in interest for securing projects early-on, energy companies sign on to more TCSC projects than they can physically (human and financial resources) manage in order to have an early grip on the market. This creates a rise in speculation over the value of rooftop space and clients, to levels higher than their current value: "And because of the licensing taking so long, of all these complexities, and then of the social complexities of getting people to join, it might be, let's say, too fast growth and then explode" (A4). In Spain for instance, this has resulted in significant delays and cancellations: "they are taking on too much" (A1). It is beyond the scope of this research to assess whether this will result in a sectoral downturn, however, this code exemplifies the rapid rise in competition that is occurring, mostly driven by private market intermediaries.

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The 'social complexities' that were just referred to in the previous paragraph have to do with how competitive market intermediaries underestimate how difficult it is to find consumer members in the locality to sell the excess supply to: "you need to be on the ground, talking to people and convincing them to join the energy community. And if you are someone unknown from a company, you are going to have a very hard time doing it. We have an example of a project in Almada, which is municipally driven. And it's in social housing. And they are going to offer the electricity for free for the families, so they do not have to pay anything. And they are looking for 130 members. And I think they have completed 60 over a few years already. And the people, they just have to sign the paper and they are going to get free electricity. And still, it is hard. And this is the municipality, this is public housing" (A4).

Moreover, there is a recurring issue of trust which makes it difficult for intermediaries to find members for their projects. Low-income or energy poor people distrust signing onto a second energy contract due to their socialisation with energy: "that is going to be perceived as extra costs, even if it's not" (A4). There are therefore important social complexities which might be easier to overcome by intermediaries adopting socially embedded approach to project development, rather than top-down. For competitive market intermediaries, this means that it takes more effort to reach out to all the consumer members as opposed to finding a large anchor client.

A4 notes a change of strategy in competitive markets. In the first phase, companies attempted to license their project with the full list of consumer members. To do so, they adopted more locally embedded strategies (e.g. community workshops). In the second phase, companies realised that permitting with the full list of members takes too much time while market entry increased: "OK, let's just do as many projects as we can. And to do as many projects as we can fast, we cannot talk with everybody, so we are just going to get these anchor clients and two or three people around it to submit the licensing and then we'll see for the rest part" (A4). The increase in competition has reduced the

extent to which competitive market intermediaries address reach out to consumer members before starting a project.

A4 explains that the latest update from the Portuguese Directorate of Energy and Geology[6] states that, of the 609 projects submitted for licensing, 22 are RECs and 587 are collective self-consumption. Of those with full permitting, 34 projects are collective self-consumption, and only one is an REC. Therefore approximately 95% of projects in Portugal are collective self-consumption. Many of these projects are stuck in licensing or are installed but do not have enough clients to share with. Therefore, some projects begin to generate and the anchor client self-consumes without the necessary licensing for sharing or without enough clients from the vicinity: "Yeah, it's impossible. Just based on the experience and also on conversations with some of these people. And also, from the media. They say this project is going to have a thousand members. But then later on you see this news by the company saying we are looking for members for this project" (A4).

Interviewees made it clear that the dominant business model for decentralisation in Portugal is TCSC. The overwhelming majority of collective self-consumption projects are in agglomerations or in industrial areas with large companies as anchor members sharing with households or with other companies in the vicinity (e.g. football stadiums, AstraZeneca). I requested to double-check the extent to which most of the collective self-consumption projects are in fact TCSCs with the Portuguese Directorate for Energy and Geology but I never received an answer. Nevertheless, all interviewees with knowledge of the market agree that most of these are managed by energy companies with large commercial actors as their anchor clients: "And I guess that all of them, if not most of them, if not all, are controlled by third parties, by companies" (A4); "most of the collective self-consumption

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[6] Translated by the researcher from 'Direção-Geral de Energia e Geologia'

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projects, or communities, or whatever you want to call it, they are only happening within the private sector" (A5).

In short, there has been a sharp rise in competition at the expense of locally embedded strategies, competitive market intermediaries selling TCSCs currently make up most of the initiatives to decentralise energy generation in Portugal. Large companies are likelier to become the anchor clients and vulnerable consumers, natural persons, SMEs or municipalities are likelier to become the consumer members.
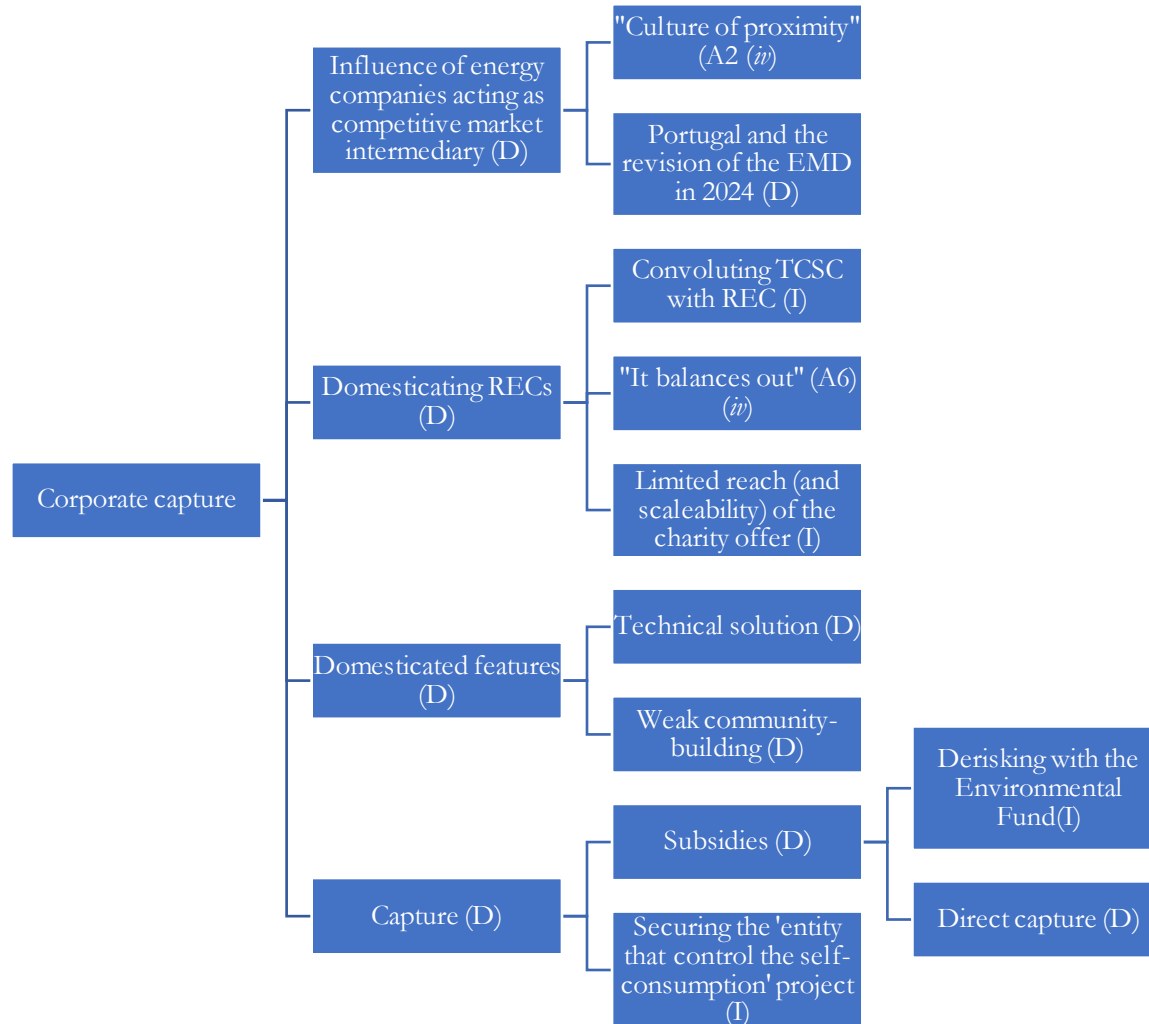
5.7 Corporate capture

Figure 6: code tree of 'corporate capture'

Figure 6 provides a comprehensive overview of the sixth overarching theme. The code tree includes deductive, inductive and *in vivo* codes. The four main categories used to structure the codes are derived from the theoretical framework and therefore labelled with (D).

5.7.1 Influence of energy companies acting as competitive market intermediaries

When inquiring on the influence regime incumbents exercised on the transposition of the CEP in Portugal. Interviewees reported on a "culture of proximity" (A2). A1 mentioned the presence of EDP, "an enterprise that acts as a monopoly" which plays an important role in the regulation of the Portuguese energy market. The example of the government falling because of an energy corruption scandal was brought up once. Interviewees could not provide any further evidence of influence than what is considered soft power i.e. influence channelled via meetings and conferences. Interviewees contrasted the overwhelming number of channels through which actors operating in competitive markets can represent their interests with those available to networks of civil interest. Several interviewees alluded to the idea that incumbent involvement in an initiative determines whether barriers stay up, and explains why the framework for TCSC is so well-developed in Portugal. A2 explains how TCSC as a policy solution to reach the goals of the CEP is compatible with the culturally dominant "pro-business" approach of Portuguese regulators. Overall, the interviewees suggest that the enabling framework for TCSC can, at least in part, be explained by the proximity between government agencies and competitive market interests.

A1 mentioned that Greenvolt belongs to this culture of proximity and privileged access. Secondary sources reveal that the current Greenvolt CEO was chairman of the Board of Directors at EDP for over a decade. He was suspended from his position by the Portuguese Prosecutor's Office on grounds of corruption and leveraging his position to gain undue advantages or profits. The case is ongoing (Agência Lusa 2024; Clbrief 2020). In 2021, he refused a "non-compete agreement" worth 1.68 million euros over three years (2021-2023) to join the Altri Group (rebranded as Greenvolt) to enter into competition with EDP in the Portuguese market for renewable energy (ECO news 2021).

The interview guide also probed the influence exerted on the 2024 revision of the internal electricity market directive. A1 does not find evidence that suggests companies lobbied against definitions of REC or CEC. Instead, they find large energy companies lobbying for widening TCSC throughout the EU. The revision of the directive is almost identical to Portugal except that "in the end, what it says is that member states can also allow for large companies to participate" […] "at least in my opinion, it should not be up to the member states" (A5). It also confirmed that experiences from Portugal, including the kindergarten project, were used to advocate for widening TCSC: "I believe we did have some influence also with other stakeholders like SolarPower Europe, of course. But at least what I can say is that we did our best efforts to bring what we find are good examples" (A5).

5.7.2 Capture

There are cases in Europe where companies, as a result of weak transpositions of the CEP, "are taking money and public subsidies" (A1) for communities, to set-up energy projects. For this reason, the destination of public financing was an important topic of inquiry. The Environmental Fund is financed through the EU's Recovery and Resilience plan. A4 claims that "if there is one that is community driven, I'll be surprised" whereas A3 thinks that the agency responsible for the fund "tried to block when they understood that the submission came from a big, large energy company. But I'm not sure of this. You know. It's what you hear in the corridors". Nevertheless, A5 guaranteed that Greenvolt does "not need subsidies, we are able to do this bringing benefits to everyone - lower prices and without subsidies."

Because the application process to the fund was so complex, competitive market and civil networks intermediaries facilitated applications. A4 raises the possibility that energy companies who provided consultancy services for applications could hope to secure the effective control of projects

with lower risks thanks to public funding, as has been observed in Spain by A1: "Maybe in the perspective of: 'Then we see how the investment is done'" (A4). Once again, the researcher made a request to gain access to the list of beneficiaries to the fund, to no avail. It is therefore beyond the scope of this research to assess which actors will be benefitting most from the allocation of the fund.

Interviewees mention other forms of corporate capture unrelated to public subsidies: "corporate capture goes, in our research, goes beyond that" (A1). They argue that the barriers which prevent bottom-up participation in decentralisation, create the demand for professional services to navigate these barriers. In doing so, energy companies become the 'entity that manages the self-consumption project'. In other words, the lack of an enabling framework provides fertile grounds for companies to capture effective control of decentralised renewable energy projects. A2 explains that: "they know what they're doing and they're not doing anything illegal".

5.7.3   Domesticating RECs

Interviewees argued that competitive market intermediaries are "community-washing" (A6) their TCSCs with large commercial clients by making use of language that serves to domesticate RECs.

TCSCs branded as 'energy communities' "stirs confusion in people" (A2). Competitive market intermediaries convolute TCSC with citizen-owned and controlled energy projects. This legitimises the former while taking space away from the latter. A6 explains that this creates "a perverse effect, which is if these private companies take all the space in collective and decentralised initiatives, where is the room for actual local renewable energy communities". A3 makes explicit reference to the CEP: "this new model occupies lots of space, and everyone forgets the primary spirit of the directive". For example, the Directorate for Geology and Energy reports progress on citizen-led projects and TCSCs by merging figures together although they differ significantly in principle and in the space they are taking. Greenvolt itself convolutes the charity offered in its 'inclusive energy communities' with their

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core business model, by claiming to support 250,000 vulnerable households by 2030. It is hard to imagine this can be achieved with 1 inclusive energy community per year.

Competitive market intermediaries use the term 'community' and the language of energy poverty, inclusivity, low income and vulnerable households to brand TCSCs in a positive light: "it's for marketing" (A3). On the on hand, it can overcome distrust or enhance the inclination to sign on to two energy contracts. On the other hand, it creates a convincing signal to policymakers that the CEP is being met. Nevertheless, A5 explains that they "do not want that Greenvolt's business model is confused with saying that it's the same as a renewable energy community [(REC)]. We offer other types of services, which can also include services to REC. Nevertheless, I think we are doing a lot for the community at a local level".

Interviewees raised the issue that in the 'inclusive energy communities' program, the anchor member charity towards consumer members is not systematically replicable, it is a unique feature of the kindergarten project. More importantly, the charity offered by Greenvolt is not systematically replicable either, it is limited by the ambition of the program. A4 explains that "Greenvolt is not going to put millions of euros in projects for social purposes. They can do one, two, three maybe" […] "They want to show that it works and they want to use it as a banner. But they cannot do all projects like that." […] "But in that project, I do not think that they are making a sustainable business case, because it's not the goal to do it". Although A5 claims the contrary: "This model, I think it's super noble in the sense that it can help a lot, and at the same time, it's profitable. And when it's profitable, you can replicate many". For instance, SCMC was studying two more projects with Greenvolt but A7 shares that: "what I think every moment about this is. Why not more projects? Why not?" […] "But they cannot do projects like this at this moment". A6 concludes that it is "also one of the problems of those very targeted programs. They don't have the reach we would like them to".

"It balances out" (A6) refers to the criticism that although Greenvolt may not be making any profits in the kindergarten project. The project helps marketing the company as 'community-friendly' to policy makers and potential clients: "I think this is where we can ask if this is community-washing, if the word energy community is here" […] "they get their money from the deals they are making with other private companies, and they get to have this good image by doing projects like inclusive communities" (A6).

5.7.4   Domesticated features

TCSCs are qualified by interviewees as a technical or technological solution. The business model focusses on meeting the technical requirements to efficiently decentralise energy generation at the point consumption. By optimising the social complexities of setting-up an energy project: "They see it as a more efficient way of producing and sharing renewable electricity. For them it is not a question of transferring property" (A6).

As a result, TCSCs do not foster community-building attributes: "you don't have to worry about dealing with your neighbours" (A3); "Why would citizens even want to bother? If a private company can offer them beneficial conditions. Without any disturbance. The convenient solution, precisely. […] And citizens do not have this so-called burden. Which can also be democracy. Democracy is a burden" (A6).

6. Discussion

6.1   Chapter overview

This chapter first uses the three tenets of energy justice developed in the theoretical framework to discuss the case study in the greater context of companies selling TCSCs. The discussion then

moves on to the enabling framework for REC and TCSC in Portugal. The last point of discussion centres around Pel (2016)'s thesis on corporate capture.

6.2 Recognitional justice

The CEP identifies "natural persons, SMEs and local authorities" and "low-income or vulnerable households" as the group which should benefit from an enabling framework for energy decentralisation (European Union 2018, Article 2 (16b); Article 22 (4f)). In the kindergarten project, the results reveal that vulnerable groups in the locality are allowed to join and gain benefits. Therefore, Greenvolt identifies vulnerable groups as the rightful beneficiaries of this project.

The kindergarten project is part of a corporate social and environmental responsibility program which amounts to charity. This offer is not consistent, it cannot be considered to reach out equally to all vulnerable groups identified in Portugal. Although this may diverge from the rhetoric of companies selling TCSCs, they do not identify vulnerable groups as the main group entitled to the benefits of decentralisation via TCSCs.

Competitive market intermediaries ultimately recognise clients and their shareholders as the beneficiaries of their services. The dominance of TCSCs in industrial clusters is evidence to support the claim that the most important group for competitive market intermediaries selling TCSCs are predominantly industrial or commercial actors with (several) large rooftops. Some projects even start without having any contracts or the permits to sell the excess to consumer members. Vulnerable groups, "natural persons, SMEs or local authorities" in so far as they are living in the vicinity of a rooftop worth investing in, are usually relegated to the consumer member status. And consumer members gain fewer benefits for the same or higher costs per kwh (in the absence of an enabling framework for REC).

Even though the kindergarten project reflects the recognitional justice implied by the CEP, this offer is limited. The core of the business recognises private sector actors with large rooftops.

6.3 Procedural justice

In the kindergarten project, ownership is fully held by the energy company for the duration of the contract. All members exercise limited participation via the energy sharing app provided by the company. It allows members to monitor their consumption in relation to the installation's generation. Members can take decisions on their individual consumption accordingly. However, the community management service the company offers, mediates all other decisions. It precludes any collective procedures for deciding on issues that concern the energy project and its members. Decision-making powers ultimately lie with the energy company who consults the anchor member and may allow the consumer member to voice preferences. The consumer members i.e. the vulnerable group plays a limited role in making decisions on the project, having no voting rights. Although the current relationship of trust between SCMC and the consumer members guarantees fair decisions, this is unique to consensual and collective decision-making in civil networks. At the end of the contract, although a fair deliberative process will certainly prevail, it will be SCMC's decision whether to involve more the vulnerable group in decision-making procedures.

Competitive market intermediaries selling TCSCs concentrate voting rights in the hands of the energy company. Effective control is not exercised by members located in the proximity of these renewable energy projects, at least during the length of the contract. The anchor client has the strongest procedural rights in the locality of the project, they may voice preferences and consult the consumer members. Consumer members have the weakest procedural involvement in the project, they possess no voting rights (e.g. over their use of excess energy). They are exposed to the company's decisions or the anchor member's preferences. This can lead to situations where decisions taken in

the interest of the anchor client, or company shareholders, arbitrarily reduce benefits for consumer members. Because of this, members of TCSCs do not have the opportunity to resist excessive control by competitive market intermediaries acting in a different geography i.e. members do not exercise autonomy. This changes at the end of the contract, the anchor member gains full control over decision-making procedures. Nevertheless, consumer members maintain their precarious decision-making status.

In terms of the inclusive community offer, it does not perform well for procedural justice, the vulnerable groups it aims to address are not involved in decision-making. Nevertheless, the nature of the kindergarten project mostly guarantees fair decisions. In terms of the standard TCSC business model, it performs worse for procedural justice.

6.4 *Substantive justice*

The spatial dispersion of the costs and benefits in the kindergarten project are clear from the purpose of the project. Greenvolt provides tangible environmental, economic or social community benefits to a vulnerable group in a social housing neighbourhood located in the vicinity of the renewable energy project. This group consumes energy that is environmentally friendlier. Members receive economic benefits whether directly on their energy bill or with the kindergarten reinjecting savings into its community offer. In terms of social benefits, the project increases a sense of solidarity and the group benefitted from two energy literacy workshops. In this case, SCMC chose to enhance the direct economic beneficiation of the vulnerable group by being charged a higher PPA price. This a characteristic of substantive justice in civil networks where actors tend to share benefits collectively with community participants. Nevertheless, the lack of participation limits opportunities for learning and collectively designing measures to reduce energy demand. This reduces the available benefits.

In its inclusive community program, Greenvolt does not charge a profit margin. It successfully provides benefits of decentralised renewable energy to a vulnerable group, at the lowest possible cost. This form of substantive justice constitutes 'reciprocity'. When companies redistribute benefits to people they do not directly recognise as their clients. Companies selling TCSCs target large businesses whereas reaching out to vulnerable communities remains secondary.

Beyond the reciprocity of the inclusive community program, companies deliver substantive justice to their clients by providing competitive services. To maximise profits, companies develop TCSCs "at the lowest possible cost", they harness economies of scale and pursue efficiency gains which successfully contributes to bringing about some of the economic and environmental benefits of decentralising energy generation. These benefits are open to anchor clients and equally open to all consumer members in the vicinity. The geographical distribution of these benefits is conditioned by the company's profit incentives. To maximise profits, companies target anchor clients that can provide large spaces. This leaves out localities where there are no viable business cases to invest in (e.g. smaller or less industrialised communities). It can therefore be said that TCSCs address substantive justice unevenly across Portugal.

Another issue of importance identified in the results relates to consumer members who gain fewer benefits from the project for the same or higher costs per kwh. Anchor members consume most of the energy, generate more grid access tariff exemptions, have stronger decision-making powers, and eventually gain ownership of the installation. In TCSCs, benefits are unevenly distributed between anchor members and consumer members although consumer members are incurring similar or higher costs compared to the anchor member. For the vulnerable households involved in such schemes, they never gain ownership which does not address their underlying exposure to energy poverty.

A TCSC constrains the ability of members to participate in the project, participation is limited to a cost-benefit decision of whether to take up a contract. This comes at the expense of participatory

approaches which enhance people's understanding of how to save on their energy bill. It also does not encourage collective solutions to energy demand reduction, drawn out bottom-up by people active in their community. For this reason, TCSCs do not tap into some of the potential benefits with decentralised renewable energy projects involving citizens i.e. create fewer benefits stemming from community-building.

Because the company is the entity that controls the self-consumption project, it decides on the extent to which the costs and benefits that are created, are shared, and with whom. It collects the grid access tariff exemptions and the lower VAT that members generate on the energy they self-consume, and then applies a price reflecting a profit margin. In other words, members do not collect these benefits directly and they are not collectively shared (e.g. the grid access tariff exemptions). The disproportionate control competitive market intermediaries have over a TCSC project alters the distribution of costs and benefits, mostly to the profit of the competitive market intermediary and the anchor client.

6.5   The enabling framework

The results reveal that both TCSCs and RECs face barriers, however RECs face markedly higher barriers than TCSCs. The legal barrier particularly makes it harder for RECs to take shape under their legal title, which explains their marginal presence. The financial, administrative and cultural barriers prevent the formation of bottom-up initiatives. Although civil network and competitive market intermediaries are actively mediating, the enabling framework for genuine bottom-up initiatives is mostly inexistent. For this reason, citizen-led energy projects do not operate on a level playing field with companies selling TCSCs in Portugal.

In the absence of an enabling framework for RECs, companies selling TCSCs offer an avenue down which decentralisation does occur. The business model does reach people who wouldn't be

reached otherwise. But TCSCs cannot be understood to deliver the same costs and benefits for the groups identified in the CEP.

The previous subsection argued that vulnerable groups, natural persons, municipalities or SMEs usually participate in TCSCs as consumer members, collecting fewer benefits for the same or higher costs than anchor members. This subsection argues that they also collect fewer benefits for the same costs than if an enabling framework facilitated their participation in RECs. The lack of an enabling framework for REC provides a situation where the groups targeted by the CEP do not have any decision-making powers and gain fewer benefits for the same costs in local energy projects than if measures would facilitate their participation in RECs. This currently results in a structural injustice where the benefits of energy decentralisation predominantly reach large businesses whereas the groups identified in the CEP are not properly being addressed.

The weak presence of the government in decentralisation has left space for competitive market and civil networks intermediaries to step in. Competitive market intermediaries have successfully identified a profit driven business model which explains their involvement in decentralisation. Civil network intermediaries have provided services for the groups identified in the CEP, but their presence remains marginal. The disproportionate size and the privileged access to the government of competitive market intermediaries explains the dominance of TCSCs.

In terms of the allocation of public money, the Portuguese enabling framework allocates EU subsidies to facilitate decentralisation. The rules for state-aid in the CEP prescribe that citizen-led initiatives must compete on an "equal footing with other participants" by taking into account their specificities (European Union 2018, Article 22(7)). Support mechanisms must therefore be fair and transparent. In Portugal, the complexity of the application process heightened the barriers for citizen-led initiatives, creating the need to resort to competitive market intermediaries, and civil network intermediaries to a smaller degree. The lack of transparency over the criteria does not guarantee that

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vulnerable groups, natural, persons, municipalities or SMEs are the main beneficiaries of the financing. Nevertheless, it remains to be seen how these benefits will be distributed and the extent to which companies will capture some of the funding.

6.6 Corporate capture

Portugal is currently at the stage of niche diffusion where new connections are being tested and actors may lock-in early institutional privileges. When delivering on the CEP in Portugal, governance has been pushed out to civil network and competitive market actors. The former exhibiting a much weaker regime position than the latter. The close relationship between energy companies acting as intermediaries and the government, explains why TCSC faces fewer barriers in Portugal. The advocacy efforts of competitive market actors did not aim to weaken RECs or CECs, they aim to bolster TCSCs which reinforces their regime interests. In the latest revision of the internal electricity market directive, those same actors successfully pushed for widening TCSC across the EU, using the examples from Portugal. It remains to be seen how this affects the level-playing fields in other MSs.

Competitive market intermediaries or energy companies, have intermediated the decentralisation of renewable energy at the point of consumption, this is a radicalisation of their initial position. However, they foster a model that reduces the benefits that would be available for the groups identified in the CEP but concentrates benefits with actors that are not identified in the CEP. Furthermore, their model involves no or weak community-building characteristics, which is less transformative than what RECs could provide. Therefore competitive market intermediaries for TCSCs exhibit domesticated features of RECs.

The use of the language of RECs helps companies selling TCSCs to gain legitimacy in the eyes of the media, policymakers and consumers. Community-washing convolutes RECs with TCSCs which

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domesticates the radical demands made in the CEP. This is creating a situation where policymakers i.e. those responsible for implementing the CEP, interpret TCSCs as a substitute for RECs when the results reveal that the distribution of costs and benefits to target groups differs widely. From this perspective, the appropriation of the concept of an 'energy community' and the language of inclusivity domesticates the decentralisation implied by the CEP and brings it back within hegemonic frameworks.

The situation is exacerbated by the height of barriers to citizen-led energy projects. The lack of an enabling framework for REC creates fertile ground for companies to step in and offer mediation. Those are favourable conditions for capturing bottom-up interest in a local renewable energy project. By doing so, companies domesticate community-led projects into TCSCs i.e. they capture the effective control and iterate a distribution of costs and benefits which favours their interests.

It is however necessary to look at capture from a longitudinal perspective. TCSCs lock-in rooftops into 15-year contracts approximately, this is occurring fast, in a context of accelerated competition. For this period, the benefits of decentralising energy will be dispersed unevenly and with higher costs for vulnerable groups than in the presence of an enabling framework. Once the anchor client gains ownership of the energy project, they may decide to adopt radicalising features by renewing the project along more associative lines (e.g. allowing consumer members to buy shares). Hence, TCSCs do not prevent the later creation of an REC. TCSCs can be considered an incremental step towards a more democratic and decentralised energy system. This claim however will require further, and timelier, research.

The lack of transparency around the Environmental Fund makes it unclear at this stage whether and to what extent competitive market intermediaries will capture public money meant for the groups identified in the CEP.

7. Conclusion

This paper first introduced TCSCs as an emerging business model that large energy companies are increasingly adopting to participate in the decentralisation of the European energy system. The issue was framed in the context of the provisions included in the CEP which implicitly require that MSs decentralise their energy system in a way that fosters community ownership and control of local energy projects, particularly for vulnerable groups.

The literature review introduced community ownership and control as a factor which can enhance the transformative potential of decentralised renewable energy projects. The TCSC business model lies at an intersection between neoliberalism and communitarianism making it unclear how it aims to resolve competing visions of decision-making, and the dispersion of benefits. On the one hand, scholarship indicates important advantages to involving the resources of large energy companies in transformative change. On the other hand, scholarship highlights the risk with powerful vested interest in transformative change bringing back radical sociotechnical innovations back within hegemonic frameworks. Namely, transforming the citizen into a consumer. And, the market-based provision of essential services rarely benefiting disadvantaged communities most. The literature review concluded on consumer stock ownership plan for RECs, an existing business model which meets the CEP while tapping into the advantages that energy companies can offer.

The following chapter developed a theoretical framing of energy justice based on the goals of the CEP and articulated a definition of corporate capture. Living-up to the gaps identified in the literature required a methodology characterised by depth rather than width. To answer the research question with the most amount of nuance, a case was selected which reflects the unique way in which competitive market actors deliver on energy justice.

The research reveals that the kindergarten project delivers on recognitional and substantive justice best. Nevertheless, the charity offer is not consistent enough to reach out to all vulnerable or

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energy poor households in Portugal. In the greater context of its use, it can be observed that the business case for TCSC predominantly privileges a decentralisation of the energy system where benefits concentrate with the anchor client and the interests of energy companies. Whereas the main group identified in the CEP are either not addressed or relegated to consumer member status, collecting fewer benefits for the same or higher costs both in comparison to the anchor clients, and if an enabling framework for REC were fully developed.

The situation is exacerbated by the absence of government which has pushed responsibilities outwards, creating a sustained demand for professional services to navigate barriers to decentralisation. It is worth emphasising clearly that TCSCs do provide economic and environmental benefits to its clients. So far, they have proven to be a particularly valuable business model for large commercial actors looking to decarbonise their activities. While creating residual benefits for the groups or other businesses living in the vicinity. Nevertheless, competitive market intermediaries selling TCSCs do not decentralise the energy system in the way implied by the CEP. For this reason, this research supports the claim that competitive market intermediaries for decentralised renewable energy projects transform the resources they transfer and alter who the beneficiating groups are.

The current enabling framework does not foster a level playing field between competitive market actors selling TCSCs and genuine citizen-led initiatives. It provides the same incentives for RECs and TCSCs while RECs face pervasive barriers. This is reproduced by the advocacy efforts of competitive market intermediaries who benefit from privileged access. In fact, the kindergarten project is used as a rhetorical device to brand their services along the lines of RECs. The use of this language serves the interest of competitive market actors. When this is deceiving from the point of view that their offer provides the group identified in the CEP with fewer benefits for similar or higher costs.

As such, there remains the possibility that after the duration of the contract, the anchor member decides to formulate a participation model which is more transformative of the energy

system. It remains to be seen whether TCSCs are in fact a step towards a more democratic energy system.

As a concluding remark, this paper essentially argues that relying on the market-based provision of decentralisation only addresses the CEP in part. Now that the revision of the internal electricity market directive has widened the use of TCSC at European level. There is a risk that, particularly in lower income countries, national policymakers repeat the choices made in Portugal. The market-based provision of decentralised energy services is insufficient to meet the goals of the CEP. National policymakers should refrain from perceiving TCSCs as substitutes for RECs since both business models exhibit different attributes. Even though large energy companies may stand to gain more benefits from selling TCSCs. TCSC is yet to prove itself as a superior business model to consumer stock ownership plans for RECs.

For this reason, it is a matter of justice that MSs also provide measures that support the groups identified in the CEP to form RECs. It is also a matter of justice that those companies refrain from convoluting RECs with TCSCs. This serves to reproduce their regime interests at the expense of designing measures that target citizen-led initiatives and evenly benefit vulnerable households.

This research has faced several shortcomings which could be addressed in further research. Access to the allocation of public subsidies or to the list of entities that manage the self-consumption projects could have provided more definitive results to the research question. Gaining access to this data could provide valuable insights. Second, it is becoming increasingly relevant to research the relative fairness of pricing for anchor and consumer clients in TCSCs. This issue surfaced multiple times in the interviews but the data collection was inconclusive on this issue. This research recommends that further research runs predictive modelling techniques using the contract terms of members against a market baseline. Third, the sample used in this research failed to include consumer members. Their lived experiences could generate insights that are not currently publicly available.

Engaging directly with these groups could provide unconsidered answers to the research question of this paper.

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