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The Politicisation of Powering Change

Unravelling the Effect of Politicisation on Policy Responsiveness in European Renewable Energy Policy

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Abstract

Renewable energy is increasingly subject to politicisation in the European Union. This politicisation primarily stems from its potential in achieving climate targets, and concerns over economic and energy security. As this renders European society generally in favour of renewable expansion, public policy should be responsive to this and deliver adequate policy outcomes. This study thus explores the intricate dynamics between politicisation and policy responsiveness in European renewable energy policy. Leveraging a synthesis of post-functionalism, responsiveness theory and differentiated policy implementation, I claim that politicisation enables rather than restrains stronger policy outcomes. Employing Fixed Effects panel linear regression models, my analysis is based on a novel database containing extensive data on all 27 EU Member States over the period of 2009 until 2022. In contrast to most prior research, the results demonstrate that politicisation does enable an uptake in renewable energy as policy outcome. This is particularly the case when the outcome in question has already gained momentum. However, the enabling role of politicisation is contingent upon various economic and political-institutional variables. The findings present valuable practical and theoretical contributions for a comprehensive understanding of how politicisation can drive the trajectory to a sustainable future.

KEY WORDS Renewable Energy Policy • Politicisation • Policy Responsiveness • European Union

Samenvatting

Hernieuwbare energie is in toenemende mate onderhevig aan politisering in de Europese Unie. Deze politisering komt voornamelijk voort uit het potentieel van hernieuwbare energie voor het behalen van klimaatdoelstellingen en bezorgdheid over economische en energiezekerheid. Aangezien de Europese samenleving hierdoor over het algemeen voorstander is van uitbreiding van hernieuwbare energie, moet het overheidsbeleid hierop inspelen en adequate beleidsresultaten opleveren. Deze studie onderzoekt daarom de complexe dynamiek tussen politisering en beleidsresponsiviteit in het Europese beleid voor hernieuwbare energie. Door gebruik te maken van een synthese van post-functionalisme, responsiviteitstheorie en gedifferentieerde beleidsimplementatie, claim ik dat politisering sterkere beleidsresultaten mogelijk maakt in plaats van tegenhoudt. Mijn analyse maakt gebruik van lineaire regressiemodellen met vaste effecten en is gebaseerd op een nieuwe database met uitgebreide gegevens over alle 27 EU-lidstaten in de periode van 2009 tot 2022. In tegenstelling tot het meeste eerdere onderzoek tonen de resultaten aan dat politisering een toename van hernieuwbare energie als beleidsresultaat mogelijk maakt. Dit is met name het geval wanneer het resultaat in kwestie al in een stroomversnelling is geraakt. De faciliterende rol van politisering is echter afhankelijk van verschillende economische en politiek-institutionele variabelen. De bevindingen leveren waardevolle praktische en theoretische bijdragen voor een beter begrip van hoe politisering het traject naar een duurzame toekomst kan sturen.

KERNWOORDEN Hernieuwbaar Energiebeleid • Politisering • Beleidsresponsiviteit • Europese Unie

Preface

Yet another thesis?

The file name of this document has been "*nog een thesis*" for as long as I have been working on this project. While it is in fact my second thesis after my first Master's degree in Ghent, this is not just another thesis. It effectively ends my time as a student, and what a wonderful time it has been! Throughout the last six years, I found a passion for climate and energy policy which I emphasised academically whenever I had the opportunity to. As a matter of fact, I did this second Master's degree so I could learn more about this newfound passion. Therefore, I am proud that this second thesis lies at the intersection of comparative politics, public administration, and the energy transition.

I am proud of the quality of this work, and of the fact that it took so long to get here. Indeed, it took six years of working towards this moment, but this thesis itself contains weeks upon weeks of diligent effort. The people who know me know that I tend to challenge myself – or "make it too hard for myself" in their words. I do believe, however, that this thesis would not mean as much to me as it does if I "just kept it simple." Challenging myself is something I want to continue for the rest of my life, especially now a new chapter of my life kicks in. It has been an absolute privilege to study for this long, and an even bigger privilege to do it in great company. That's why I have a couple of acknowledgements to make. First, I want to thank Prof. Dr. Katja Biedenkopf for the advice and the support to guide me through the complex conceptual links of this thesis.

I want to thank Fadel for co-writing my first thesis and always challenging me, which ultimately led me to be certain I want to work on climate and energy policy. I also want to thank my other friends I met during the first Master's in Ghent. Thank you, Brian, Lorenz, Daan, Andreas, Bert, and Michaël, for both fun times and support. I would not be as driven as I am today without you guys to always challenge and support me. I also want to thank Thomas, Mathijs and Jakob, for always believing in me and the good times we have had along the way. Last but not least, I want to thank Kato. For the last four years, she has always had to put up with me and my work, and she has always supported and believed in me. Equally important, she was always there to make sure I also enjoyed life together.

I hope this thesis will be as insightful to the readers as it was to me. Have a good read.

Jonas Meuleman

Zedelgem, 16 August 2023

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List of Abbreviations

DPI	Differentiated Policy Implementation
EB	Eurobarometer
ECSC	European Coal and Steel Community
EEA	European Environment Agency
EGD	European Green Deal
ESS	European Social Survey
EU	European Union
EU27	27 European Union Member States
FDI	Foreign Direct Investments
FE	Fixed Effects
GDP	Gross Domestic Product
GHG	Greenhouse gas(es)
IEA	International Energy Agency
IRENA	International Renewable Energy Agency
M#	Model #
MLG	Multilevel governance
MS	Member State(s)
OECD	Organisation for Economic Cooperation and Development
OLS	Ordinary Least Squares
PAA	Policy as adapted
PAI	Policy as implemented
PCSE	Panel-corrected standard errors
PLM	Panel linear model
RE	Renewable energy
RED	Renewable Energy Directive
RES-E	Renewable electricity
SD	Standard deviation
TSCS	Time Series and Cross Sectional
US	United States
VIF	Variance Inflation Factor
WB	World Bank
WGI	Worldwide Governance Indicators

INTRODUCTION

In the midst of a changing political climate, the European energy scene is slowly changing towards a cleaner and more sustainable future. Renewable energy [RE] has become a cornerstone of contemporary energy policy, resonating not only with environmental concerns but also with the geopolitical intricacies of our time. As hydrocarbon resources are increasingly scarce and belonging to geopolitical adversaries, the European Union [EU] is set on a quest towards energy independence and climate neutrality. Enter the notion of politicisation. Through this array of concerns, renewable energy gained ground as a key political issue after having previously been a rather technical matter. The energy transition toward renewables is more than a policy shift, however, as it reflects an opportunity to enhance the responsiveness of governments across the EU, aligning with a society which is now strongly in favour of an uptake in renewables. Indeed, as renewables have a more multifaceted impact, its deployment has become a societal issue stretching further than just public policy. Through politicisation, renewable energy has towered over policy discussions on the energy transition, industrial competitiveness, and strategic autonomy. This study explores the power of politicisation to enable, rather than constrain the energy transition and as such enhance policy responsiveness.

The renewable shift is thus playing a major role in Europe's broader sustainability transition, as it is vital to achieving climate targets, improving energy and economic security, and boosting prosperity within both social and planetary boundaries (see Raworth, 2017; EEA, 2022; IEA, 2023). While the International Energy Agency [IEA] (2022) forecasted renewables to make up the largest source of electricity by 2027, Ember already reported that 12 per cent of the EU's energy mix consisted of just solar power over the summer of 2022, saving €29 billion in fossil gas (Czyżak et al., 2022). There are plenty of reasons for ramping up renewable energy capacity, and clear indications have shown that renewables are taking over globally, yet the EU27 is not quite close to achieving the newly proposed 42.5 per cent RE target by 2030 (European Commission, 2023c). This ultimately brings up the question of how politicisation affects European governments to be responsive to these indications. In other words, this is the central research question for this study: "To what extent does politicisation condition policy responsiveness in European renewable energy policy?"

There is a vast body of literature dedicated to politicisation as a concept (e.g., De Wilde et al., 2015; Palonen et al., 2019), its measurement (e.g., Hutter & Grande, 2014), and its application on European integration (e.g., Hutter & Kriesi, 2019; Schimmelfennig, 2020; Risse, 2014; Zeitlin et al., 2019). However, the literature has rarely touched upon the politicisation of European energy policy *per se* (see Keypour & Ahmadzada, 2021 for an exception). However, an issue as transformational as the decarbonisation of the power sector is bound to be a source of political contestation, and indeed, "few issues are as politicised as energy" (Druckman, 2013, p. 617). By addressing this study's research question, we venture to contribute to the understanding of how politicisation shapes actual policy outcomes and thus policy responsiveness. Politicisation is mostly linked to the policy formulation stage (e.g., De Wilde et al., 2015), but I follow Biedenkopf et al. (2021) by claiming that politicisation as a behavioural outcome can occur in varying stages in the policy cycle. Hence, politicisation can also occur in the policy implementation stage, a link that is developed through incorporating the concept of customisation (see, e.g., Zhelyazkova & Thomann, 2022) in the equation. In short, politicisation and policy implementation overlap through national discretion while transposing EU Directives through new rounds of decision-making (Bondarouk & Mastenbroek, 2017; Gollata & Newig, 2017). Hence, by leveraging a synthesis of literature branches on politicisation, responsiveness and policy implementation, this thesis contributes to a new understanding of how politicisation and policy outcomes interact.

Based on the literature, four hypotheses on this relationship were set up to facilitate an iterative, yet comprehensive analysis of this relationship. To address these hypotheses and the central research question, a Fixed Effects Panel Regression was employed. The strength of this methodology is in the fact that it allows to analyse all EU Member States [MS] over an extensive period of time without sacrificing heterogeneity across those research units. Here, a range of relevant variables were analysed alongside politicisation and responsiveness across the period of 2009 until 2022. For this, this study contributes to the literature by constructing a composite index of politicisation – a novelty in the field – to capture a broad range of politicising variables. The results have shown that politicisation does enable rather than constrain policy outcomes, particularly when the issue at hand has already gained some momentum.

This finding is the culmination of a rigorous conceptual and theoretical foundation, which is elaborated in Chapter 2. This framework will then be operationalised in Chapter 3, which delves into the quantitative architecture of this study, along with methodological considerations pertaining to data collection and analysis. The concluding stretch of this thesis (Chapters 4, 5 and 6) finally unveils the empirical results and navigates their practical and theoretical significance.

1 THE EUROPEANISATION OF RENEWABLE ENERGY

Energy has been a core component behind European integration since the early Treaties establishing the ECSC and Euratom in 1952 and 1957 respectively (Benson & Russel, 2015). Ever since, energy has not left the eye of the EU – as seen in Figure 1. The Lisbon Treaty Europeanised energy by marking it a shared competence, which effectively mandated the European Commission [hereafter: the Commission] to consolidate a fragmented EU energy market (Keypour & Ahmadzada, 2021). As part of the Commission's 2008 Climate and Energy Package,[1] the first iteration of the Renewable Energy Directive [RED] was launched. This was the first legislation on renewable energy to provide a common framework for all MS across industries, after a series of largely failed and incomplete pieces of individual legislation (see Howes, 2010; Dekanozishvili, 2023; EEA, 2013). Energy became a pressing policy issue as part of the broader discussion on climate change, where the EU was allowed to play a leading role in shaping the European energy transition. The RED, as well as the Energy Union Strategy, enabled the EU to meet its climate commitments by 2020 through binding targets and national discretion (EEA, 2021).

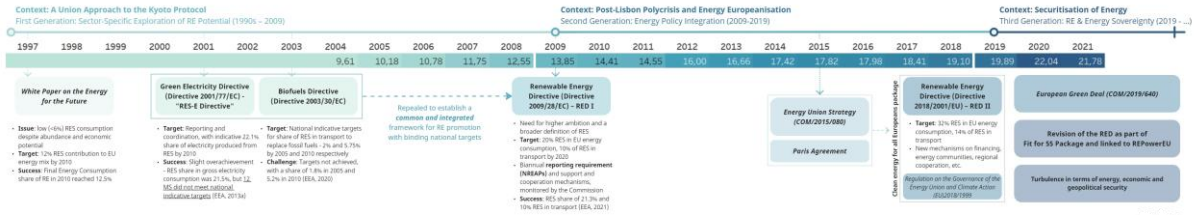

Figure 1 **Evolution of European renewable energy policy and RE shares.**
Note. Policy generations are indicative of broader EU environmental policy evolution (see EEA, 2019, p. 14). Data on the share of renewable energy in the EU27 is collected from Eurostat (2023e).

Previous literature has characterised energy policy change as incremental (Dupont et al., 2020; Benson & Russel, 2015). Recently, the energy transition has accelerated with the presentation of the European Green Deal [EGD] and following legislation to legally bind Europe to climate neutrality by 2050 (European Commission, n.d.-a, b). Dupont et al. (2020) perceived the EGD as a critical juncture in aligning the EU to the Paris Agreement – granted effective implementation. Especially through REPowerEU, the EU is doubling down on the energy transition, sparking a surge in European investments (Hollinger, 2022; Cornago, 2022). Here, renewables are boasted as the cornerstone of the EU's strategy to support energy independence (European Commission, 2022a-b) and maintain industrial leadership in an increasingly competitive global climate.[2] Effectively, as wind and solar were the top electricity sources in the EU for the first time in 2022 (Jones, 2023). 2022 also marked the year where a third iteration of the RED was being negotiated within the context of the EGD and energy security issues. A provisional agreement of the RED III trilogues in March 2023 presented a binding target of at least 42.5% share of renewables by 2030, aiming for 45% which was what the Commission and the Parliament pushed for originally (European Commission, 2023b; von Homeyer et al., 2022). While hydrogen and nuclear energy are still a point of discussion (see e.g., Jack, 2023), the provisional agreement pushed political salience of renewable energy to a high point. Rising climate ambition levels and the securitisation of energy has transformed RE from a box to tick off to a salient high-politics issue.

[1] This package included the renowned 20-20-20 targets, proposing a 20% reduction in GHG compared to 1990, a 20% increase in energy efficiency, and a 20% share of RE in European energy consumption. The EU ended up achieving these targets (EEA, 2021).
[2] Hørman et al. (2022) showcase European leadership in the RE industry, yet other major powers such as the US and China have been challenging European industrial leadership (see Birol, 2022; IEA, 2022). Moreover, the 2022 energy crisis turned into a systemic crisis characterised by concerns over a less attractive European (industrial) economy (Simon et al., 2022; Tamma, 2023).

2 CONCEPTUAL AND THEORETICAL FRAMEWORK

Europe has faced a series of sequential and often overlapping crises, referred to as the polycrisis or even permacrisis (Zeitlin et al., 2019; Zuleeg et. al, 2021). The newest link in this chain is the energy crisis aggravated by Russia's war on Ukraine. Especially under the von der Leyen Commission, which was confronted with the Covid-19 and energy crises, a direct connection between crisis and positive climate and energy policy change emerged (Dupont et al., 2020). The confluence of the cost-of-living crisis and the broader energy crisis amplified by geopolitical dependencies, has relaunched renewable energy to high politics. As complex problems are solved through policy implementation and resulting outcomes, (crisis-induced) politicisation can be argued to drive policy change. In the following sections, this connection will be elucidated through an overview of the core concepts and theories of this thesis.

2.1 Politicisation as a Post-Functional Lens

With its roots in comparative politics, multi-level governance and democratic theory, post-functionalism was pioneered by Hooghe and Marks (2009) to theoretically embed the variegated day-to-day politics of European integration into Member States' domestic spheres (Leuffen et al., 2020). According to Hooghe and Marks (2009, p. 8), the process and content of European policymaking have changed so policy issues dealt with in the EU are no longer purely sui generis, becoming fully subject to bottom-up domestic pressures and party competition. Driven by a quest of national self-determination due to an ever more competent EU, politicisation marked a shift from a "permissive consensus" to "constraining dissensus" (Hooghe & Marks, 2009; Leuffen et al., 2020). This highlights a shift to 'policy with politics' where the EU has become a politically charged and contested polity, far removed from its origins as an elite-driven space of shared objectives and widespread agreement (Schmidt, 2019; Bressanelli et al., 2020). A constraining dissensus underpins how politicisation can act as a constraint to deliver effective solutions to urgent policy problems, undermining the output legitimacy the EU so heavily relies on (Schimmelfennig, 2020; Koop et al., 2021; Zeitlin et al., 2019). Nevertheless, the increased visibility of a stringent issue often coincides with expectations for supranational problem-solving, presenting an opportunity for the supranational level to effectively respond and increase its legitimacy among European citizens[3] (Koop et al., 2021).

In simple terms, politicisation can be defined as the process of turning a previously technical policy issue into the realm of mass politics (Hooghe & Marks, 2009; Palonen et al., 2019; Hutter & Kriesi, 2019). Building on post-functional insights by Hooghe and Marks (2009), the conceptualisation of politicisation broadly converged to a common definition within European studies and comparative politics literature (Palonen et al., 2019; de Wilde et al., 2015; Risse, 2014; Hutter & Grande, 2014). Asserted by de Wilde et al. (2015), politicisation requires the simultaneous increase of three underlying features: (i) issue salience, (ii) polarisation, and (iii) expansion of engaged actors. Adopted by a myriad of scholars, the current literature on politicisation has primarily explored broader processes of European integration in various policy domains (e.g., Zeitlin et al., 2019; Börzel and Risse, 2017; Morales et al., 2015; Hackenesch et al., 2021). Politicisation has thus been heavily entrenched in EU studies, yet renewable energy has rarely been highlighted. Under the notion that politicising the renewable energy transition indeed reflects an invaluable opportunity to democratise the energy transition (Burke & Stephens, 2018, p. 79), this thesis contributes to this gap in the literature.

[3] This is observable in the later stages of the COVID-19 pandemic and in calls for a price cap on gas during the energy crisis, it is clear that the Commission plays an entrepreneurial role in these initiatives.

Renewable energy has indeed become highly politicised policy issue since the post-Lisbon Europeanisation of energy. Europeanisation, or the transference of policymaking away from the sovereign MS, has been noted to depoliticise a policy issue (Chryssogelos, 2018), as early literature perceived that functional spillover to Europe took away public scrutiny and thus possibilities to politicise. Post-functionalism, however, challenges that assumption as domestic politicisation brings EU policy to the forefront of mass politics. Chryssogelos (2018) also states that crisis can re-politicise a policy area, and RE is a prime example of crisis-induced politicisation. In times of climate disruption, as well as economic and geopolitical turbulence, salience of RE mounted in public opinion and high-level politics due to cost-efficiency and energy sovereignty gains (IRENA, 2022; European Commission, 2022a-b).

Salience is widely considered as the core component of politicisation (Hutter & Grande, 2014). However, as energy transitions are embedded in socio-political processes beyond technical considerations, energy becomes a positional issue subject to polarisation (Fraune & Knodt, 2018). Whereas the necessity of the energy transition is a basis for consensus, political positioning can differ in terms of policy design in relation to economic, social, and environmental prosperity (Biedenkopf, 2021, p. 394). Renewables also become subject to polarised positioning as diverging interests meet in the policymaking arena. For instance, as part of 'new politics,' climate consciousness and related ability to increase climate governance capacity has increasingly been associated with the left end of the political spectrum in Europe (Fisher et al., 2022; Huber et al., 2021). In light of this discussion, we emphasise salience through an economic and security lens, and polarisation from a political positioning point of view (cf. infra).

Finally, the sustainability transition has enabled bottom-up politicisation through public opinion and social movements to converge with top-down politicisation from high politics (Dupont et al., 2020). In contrast to De Wilde's (2011) emphasis on politicisation as a centrifugal mechanism to inform citizens of salient issues, the rise of bottom-up politicisation suggests a centripetal shift in which the public's role becomes increasingly important.[4] In essence, a more significant role for the public and other actors in energy transitions (see e.g., the findings of Bekirsky et al., 2022) implies that the actor expansion hypothesis (see Grande & Hutter, 2016, p. 17) also applies to renewable energy. As renewables become actively salient in policy discussions, more actors mobilise — observable in more (ambitious) EU initiatives and debates; surge of activity from non-state actors (e.g., think tanks like Ember); increased green lobby activity to the EU from the RE industry (see, e.g., Ferris, 2022; Simon et al., 2022), the increasing emergence of local RE communities, etc. This has led to increased representation of RE interests in the political arena, and a greater diversity of views expressed from a broadened actor base.

[4] Nevertheless, even in highly salient conditions, bottom-up politicisation still relies on the mobilisation and representation of intermediary actors, such as grassroots organisations within civil society (De Bruycker, 2019, p. 837).

2.2 Bridging Politicisation and Responsiveness through DPI

The literature hosts a growing debate on politicisation's potential to enable rather than constrain functional problem-solving —a situation of 'enabling dissensus' offering supranational opportunity to act (Bressanelli et al., 2020; Ferrara & Kriesi, 2022). Building on this momentum, we connect politicisation to policy outcomes, in order to investigate whether there is a discrepancy between public opinion and delivered policy outcomes. Coined as policy responsiveness, this convergence of opinion and policy is a critical indicator of effective representation and democratic quality given democratic theory (Dassonneville et al., 2021; Wlezien & Soroka, 2021; Zhelyazkova et al., 2019; Steunenberg, 2019; Bølstad, 2014). Meijers et al. (2019, p. 1726) define responsiveness as "a dynamic process in which both political and bureaucratic actors actively attempt to address public concerns and preferences."

2.2.1 Conditioning Policy Responsiveness through Politicisation

Policy responsiveness posits that bottom-up politicisation – i.e., change along its three dimensions – induces policy change in the same direction (Hakhverdian, 2012). De Bruycker (2019, p. 838) found that each dimension of politicisation catalyses policy responsiveness, which is thus inherently based on changes in aggregated public opinion.[5] Politicisation de facto draws a context of change, bringing about a multitude of preferences and interests for both the EU and domestic governments to be responsive to. Politicisation can thus create both opportunities and obstacles for responsiveness. Politicisation establishes public pressure as a salient policy issue should drive appropriate and responsive government action (Bromley-Trujillo & Poe, 2020). However, multi-level polarisation may constrain both policy adoption and implementation leading to a policy deadlock. As for European RE policy, Anderson et al. (2017) found a significant relation between shifts in public opinion and the adoption of RE legislation in the EU. Across other policy areas, previous studies present diverse perspectives on politicisation's impact on responsiveness. Rauh (2018) found that politicisation spurs supranational responsiveness, while Koop et al. (2021) observed that, through increased visibility of the EU, the Commission became more responsive to the public's priorities. De Bruycker (2019) then portrayed politicisation as a condition for policy responsiveness and greater democratic quality, by considering EU policy decisions as a function of strategic momentum through politicised policy issues.

Based on these grounds and assuming an 'enabling dissensus,' this study's main hypothesis expects a positive relationship between changes in politicisation of renewable energy and subsequent changes in policy responsiveness (*H1: politicisation-responsiveness hypothesis*).

2.2.2 Responsiveness and Differentiated Policy Implementation [DPI]

Change is directly implied by (crisis-induced) politicisation, yet EU policy change is a complex multi-level process (Cerna, 2013, p. 11). Multi-level governance [MLG] is long acknowledged as a defining feature of the EU (Hooghe & Marks, 2003; Marks & Hooghe, 2004; Jessop, 2004). Consequently, European policy implementation presents a special case for the investigation of responsiveness as a multilevel context is conducive to a multitude of political-administrative venues. From the supranational adoption of Directives like the RED, MS are to transpose European policy goals into national legislation with a certain degree of discretion, complicating EU policy implementation (Zhelyazkova et al., 2019).

[5] While doubts have been raised about the EU's suitability for studying responsiveness due to a perceived democratic deficit (see Follesdal & Hix, 2006), the literature suggests it to be more responsive than assumed (Zhelyazkova et al., 2019; Meijers et al., 2019; De Bruycker, 2019; Koop et al., 2021).

Despite this, previous studies have primarily examined responsiveness from a legal perspective, emphasising policy output (adopted legislation). However, following Steunenberg's (2019), this policy-as-adopted [PAA] is not the final step in becoming policy-as-implemented [PAI]. From a MLG perspective that Steunenberg cautions against studying EU responsiveness from a mere PAA view, since PAI is crucial in solving policy problems. Therefore, this thesis decouples responsiveness from PAA to focus on PAI (Steunenberg, 2019; Zhelyazkova et al., 2016). For this, I pursue Steunenberg's (2019) outcome-oriented approach to policy responsiveness,[6] which is closely related to policy change and implementation literature branches. As developed by Thomann (2015), one branch focuses on domestic 'customisation' of EU legislation, established in bottom-up implementation theory. Customisation serves as a mid-level theory in European integration and advocates for strengthening a bottom-up emphasis in policy implementation. As such, it is a more specific level of analysis than, e.g., the related theory of neofunctionalism on which the misfit hypothesis is built.[7]

Policy responsiveness is based on an engaging role for the public to express policy priorities, and as such also drive politicisation. In this regard, Zhelyazkova et al. (2016) argue that public support is increasingly important for policy compliance relative to top-down policy steering. However, the concept of compliance tends to overlook bottom-up sources of domestic policy change (Thomann, 2015). Since EU environmental policy implementation is non-linear (Amblard & Carter, 2022), the politics of implementation cannot be left to top-down steering alone but rather in synergy with domestic contexts. Moreover, compliance reduces multilevel implementation to a binary reading where one either does or does not comply (Thomann, 2015; Bondarouk & Mastenbroek, 2017). In a multilevel context, customisation thus goes beyond legal compliance and perceives MS as problem-solvers who use discretion to customise EU policy goals to domestic contexts (Thomann & Zhelyazkova, 2017, p. 1272; Zhelyazkova & Thomann, 2022). Customisation depicts transposition changes either in density or in restrictiveness. Customised density refers to MS adding domestic rules in addition to EU legislation, bloating national regulation and disabling practical implementation. Customised restrictiveness, conversely, refers to MS changing the content of the Directive which has been shown to improve practical implementation (Zhelyazkova & Thomann, 2022; Thomann & Zhelyazkova, 2017).

Established in recent literature as differentiated policy implementation [DPI] (Zhelyazkova & Thomann, 2022), holding into account customisation enables a more fine-grained understanding of the diversity in practical European policy implementation. DPI also facilitates a direct link between politicisation and policy (outcome) responsiveness. At first glance, this is quite an unapparent relationship, as each concept represents rather distinct phases in the policy cycle (Polman et al., 2022). As Bondarouk and Mastenbroek (2017, p. 16) state, policy implementation involves decision-making in the bottom-up transposition of European directives, i.e., customisation (Thomann, 2015). This process of "operational decision-making" (Gollata & Newig, 2017, p. 1310) is subject to political considerations regarding potential policy changes. In the EU's multi-level polity, politicisation and implementation therefore overlap through national discretion and customisation.

[6] Most of the early responsiveness literature focussed on a systemic approach to responsiveness, which concentrates primarily on electoral accountability (de Wilde & Rauh, 2019, p. 1738) and the volume of legislative output as the main mechanisms of responsiveness (Toshkov, 2011; Hagemann et al., 2016; Anderson et al., 2017; Schaffer et al., 2022). Meijers et al. (2019), on the other hand, used an input-oriented approach to account for the complex interactions that make the EU policymaking process.

[7] The misfit hypothesis assumes the necessity of an institutional fit between domestic and European policy to achieve successful implementation (see e.g., Brendler & Thomann, 2023).

Given differentiated policy implementation, customisation is expected to provide a mechanism through which the relationship between politicisation and policy responsiveness is mediated. This *customisation hypothesis (H2)* thus expects customisation to be positively associated with policy responsiveness due to interaction with politicisation of the RED's content (as European renewable energy policy) in operational decision-making. Due to this substantive focus, customised restrictiveness will be the emphasis for this study.

The two main hypotheses of this thesis thus focus on the potential impact of politicisation on policy responsiveness, the primary relation of interest. While the first hypothesis expects an enabling dissensus, the second expects customisation to play an important role in that relation. Now, while EU renewable energy policy has a track record of compliance across the EU, helped by the Covid-19 pandemic (EEA, 2021; Roth et al., 2022). However, performance across Europe differs with EU MS split into frontrunners and laggards in terms of RE policy outcomes (Strunz et al., 2021; De Rosa et al., 2022). This heterogeneous implementation indicates an ambition and capacity gap between the groups. If citizens desire higher renewable energy performance it highlights a policy gap between PAA and PAI in the implementation performance of MS. [8] According to Steunenberg (2019, p. 1752-1753), such a policy gap reflects a discrepancy between public preferences, assumed to be incorporated into PAA, and PAI.

As I aim to move beyond legal compliance, this study will try to untangle which causes can be attributed to higher policy outcomes. For this, two supporting hypotheses will be tested on the context of renewable energy and its politicisation. As described earlier, the politicisation of RE is mainly based on its high salience within a context of energy security concerns and economic turbulence. Therefore, my *economic readiness hypothesis (H3)* expects that higher investment capacity will be positively associated with policy responsiveness as more resources can be allocated to increasing renewable capacity (Apergis & Pinar, 2021). Moreover, I will test how political-institutional factors such as governance capacity, institutional quality (Saba & Biyase, 2022) and the deeply political dimension of energy security interact with policy responsiveness. My *political-institutional capacity hypothesis (H4)* expects that lower (higher) levels of energy security and governance capacity will be associated with a lower (higher) degree of policy responsiveness.

[8] Climate and energy policy in the EU suffers from an implementation or policy gap as a discrepancy between the internationally agreed policy goal of limiting global warming to 1.5°C as part of the 2015 Paris Agreement and the policy actions being taken to achieve that goal. The European Green Deal, reinforced by the Covid-19 and energy crisis in the early 2020s, makes for a good step in the right direction, but remains to be tested by its implementation (Dupont et. al, 2020). At point of writing, it is not clear whether political commitment will continue along more ambitious targets.

3 DATA AND METHODOLOGY

The theoretical framework and the accumulation of the literature it is derived from has provided for a worthy conceptual foundation for empirical analysis. By means of summary, Figure 2 visualises the conceptual interlinkages within the theoretical framework and the hypotheses that follow them. Leveraging a synthesis of post-functionalism, responsiveness theory and DPI, these hypotheses will aid solving the central research question this thesis addresses: "To what extent does politicisation condition policy responsiveness in European renewable energy policy?"

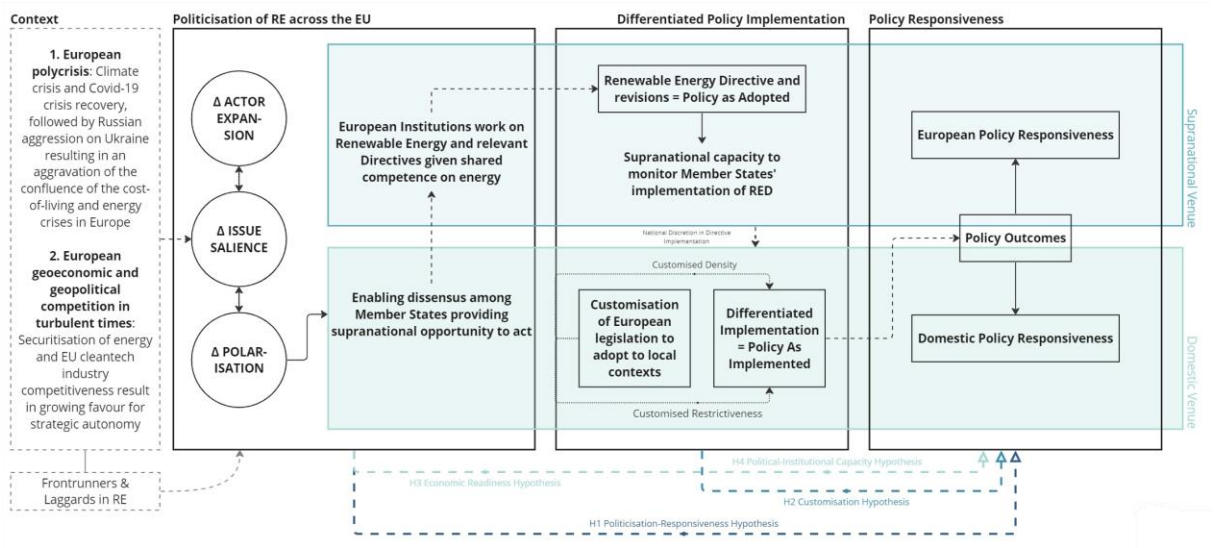

Figure 2 **Accumulation of the theoretical framework and derived hypotheses.**

3.1 A Panel Research Design

This central research question is conducive to a quantitative comparative analysis across the EU. Given the variegated domestic foundations of European politics, addressing this research question and testing its hypotheses will benefit from a cross-sectional and longitudinal design. By studying multiple subjects over multiple periods of observations, this thesis employs a panel study. Using this design, the issue of ambiguity about causal direction is addressed and a broad EU-wide understanding of politicisation and policy responsiveness can be developed (Bryman, 2012; McNabb, 2010). As such, changes over time are considered, which is particularly relevant in the context of punctuated phenomena such as politicisation (Voltolini et al., 2020). This design facilitates a high level of validity. Internal validity is realised through the analysis of the impact of the independent variable politicisation on the dependent variable of responsiveness (Bryman, 2012; McNabb, 2010). Construct validity is also enhanced through an accurate operationalisation of the conceptual framework through the data measures (Bryman, 2012).

This study will thus take all EU Member States under scrutiny (see Figure 3) in an attempt to cross case-based approaches (see e.g., Hutter & Kriesi, 2019; Brendler & Thomann, 2023). The period of analysis is from 2009 until 2022, from the inception of the RED until the culmination of the recent cost-of-living and energy crises. As such, the complete period of post-Lisbon European energy governance is covered. This delineation facilitates a strong external validity (Bryman, 2012). First, the large-n case selection enables a generalisation of findings across the EU. Second, whereas the thematic focus of this study is on renewable energy, the design and results on the implications of politicisation are applicable to a broad range of policy areas. Furthermore, given the consistency of measurement and systematic

approach to analysis, this study also enjoys a high degree of reliability and replicability (Bryman, 2012). In order to facilitate this broader time and geographical scope, this study largely relied on the collection of secondary data (Segreto et al., 2020). Through secondary data, large amounts of high-quality data were collected in a time and cost-efficient way, which made it possible to conduct a comprehensive analysis (Johnston, 2017). Moreover, the most common problem of 'data fit' (Heaton, 2008; Johnston, 2017), the fact that secondary data was produced for a different purpose than that of this research, is hardly applicable as the data tie into the primary interests of this research. Other bottlenecks of this research are founded in the nature of panel studies. For instance, the accuracy of panel regression models also relies on the assumptions of linear regression and the completeness of the panel data.

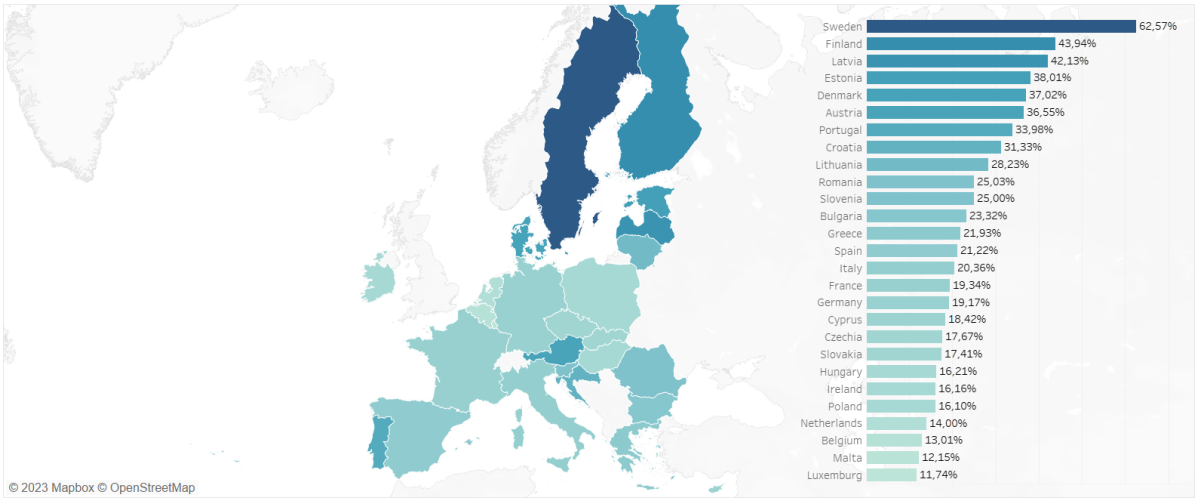

Figure 3 **Mapping EU Member States and their most recent shares of renewables [2021].**

3.2 Operationalisation and Data Collection

3.2.1 Measuring Policy Responsiveness

Policy responsiveness makes for this study's dependent variable, which can be briefly conceptualised as the convergence between public opinion and policy outcomes. However, until now it has been an assumption that an uptake in renewables is a desirable outcome for the public. Following Eurobarometer data (European Commission, 2019, 2021, 2022c, 2023a) on public opinion, citizens across regions generally wish for larger EU investments in RE with a European average of 83%, as shown in Figure 4.

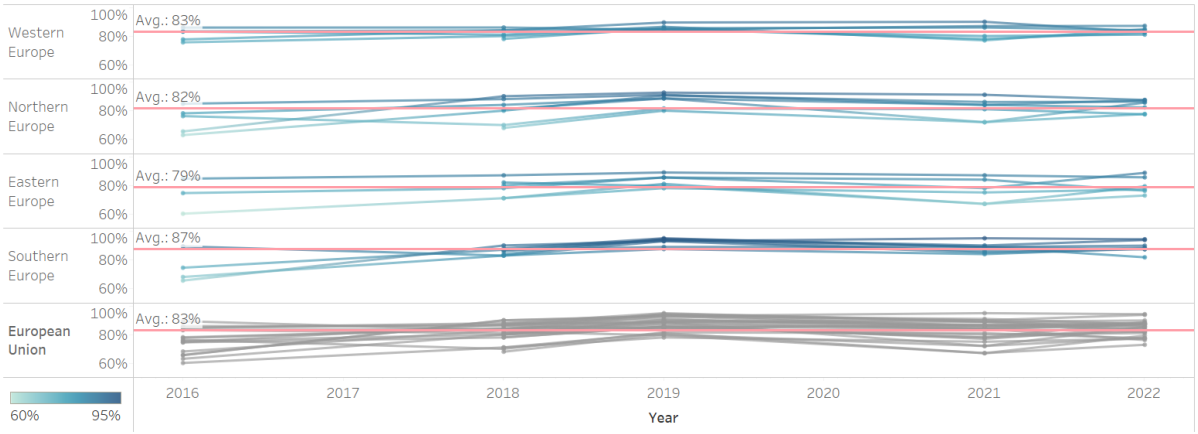

Figure 4 **European public opinion on increasing renewable investments.**

This implies a general public desire for an increased renewable uptake. As we elaborated the importance of policy outcomes and public opinion on this issue is validated, the measurement of policy responsiveness needs to be defined through which outcomes policy should achieve. Therefore, policy responsiveness will be measured through a proxy outcome variable. For this research, policy responsiveness will be measured through a variable capturing the share of renewable energy in a Member State's energy mix as a percentage (*reshare*). This data was collected from Eurostat (2023e), which ensures data quality through high-level standards. The data for this variable is available on a yearly basis until 2021 across the EU27.[9] Appendix 1 provides a descriptive summary of the dependent variable, while Figure 5 below shows the range of the share of renewables for each Member State.

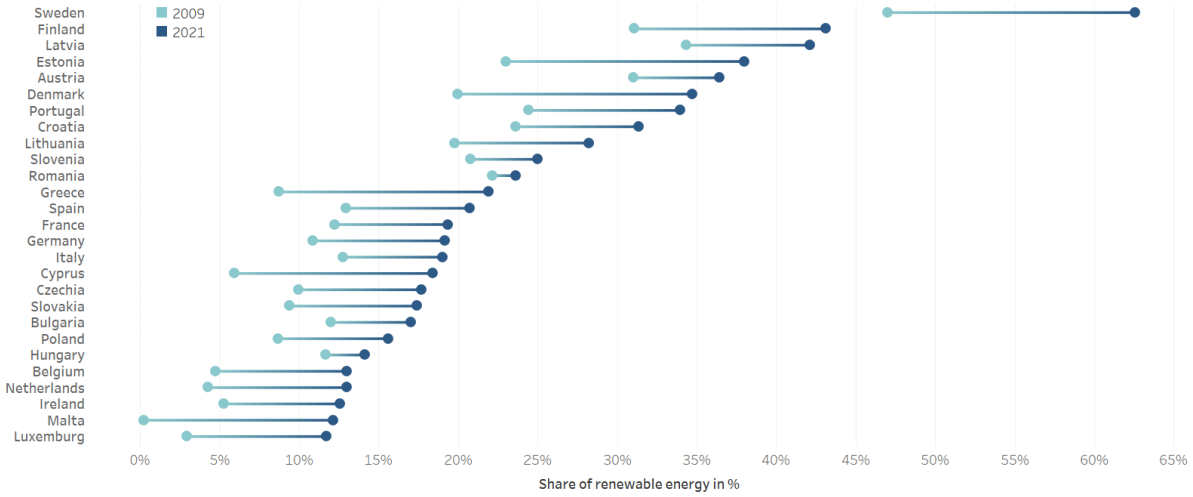

Figure 5 **Ranges of the share of renewable energy between 2009 and 2021, sorted by highest value in 2021.**

Apergis and Pinar (2021) previously used a similar dependent variable on RE consumption, and variables on avoided emissions through an increased RE uptake as well as on renewable energy capacity were also considered. However, using the share of renewables allows for a broader interpretation of policy outcomes, as it provides a more comprehensive understanding of RE compared to variables that offer a narrower view of policy outcomes (e.g., environmental impact or energy security). Moreover, the share of renewables is more clearly attributable and explicitly tied to European renewable energy policy, as it directly addresses the RED's main objective of promoting RE through a binding target. Finally, this indicator provides a more consistent basis for comparison across the EU27 as it is generally less affected by regional disparities.

3.2.2 Measuring Politicisation

The primary independent variable of this research constitutes the degree of politicisation in European renewable energy policy. Theoretically, politicisation is a multidimensional concept consisting of simultaneous changes in issue salience, polarisation, and actor engagement (see, e.g., De Wilde et al., 2015; Hutter & Grande, 2014). Since all of these notions are multifaceted in their own right, a composite index of politicisation was formed through compiling various indicators on both the public and the political-institutional level. Appendix 2 provides a summary of each indicator comprised in the index.

[9] As 2022 data will only be available by the end of 2023 (Eurostat, n.d.), this analysis faces a temporal mismatch in data availability between the primary variables of interest *reshare* and *politicisation* which is collected for 2022 as well. This implies that the analysis may be limited in capturing the contemporaneous relationship and could observe dynamics from prior to 2022.

Similar to Hutter and Kriesi (2019), I did not include actor expansion in the construction of the politicisation index as I consider change in actor expansion implicit to changes in issue salience. Naturally, when a policy issue gathers high political salience, it contributes to the implicit expansion and range of actors involved in the issue through mass media attention, agenda-setting, etc. A specific indicator on actor expansion would not add significant value to the index construction, neither does its absence invalidate the analysis. Hence, the politicisation variable is derived from only salience and polarisation indicators for which data was collected from various high-quality sources such as Eurobarometer, European Social Survey (2020), Ember (n.d.), Chapel Hill Expert Survey (Bakker et al., 2021), and the most recent Database of Political Institutions (Scartascini et al., 2021). One indicator on salience in mass media relied on primary data collection. For each MS, one reputable national newspaper was selected (see Appendix 3 on primary data collection) and the number of articles mentioning renewable energy was counted. Salience and polarisation respectively constitute six and eight indicators due to the empirical challenges related to their measurement. Both dimensions respectively emphasise the socio-economic and political-institutional characteristics of the renewable energy landscape.

In order to obtain a single politicisation measure that captures the different facets of both salience and polarisation dimensions, weighted sum aggregation methodology was used (Marler & Arora, 2004).[10] Salience and polarisation were each given a respective weight of 50% to enable equal contribution to the index. As such, I follow Hutter and Kriesi (2019) in an attempt to move beyond earlier conceptual considerations (see Hutter & Grande, 2014) that emphasised salience as the core component of politicisation. Using this methodology, the conceptual complexity of politicisation is retained, yet a simplified empirical representation enables easier analyses and interpretations. To then obtain an index ranging from 0 to 1 and mitigate scale differences across indicators, the following normalisation formula was used across Member States, where x is the politicisation value: $x_{norm} = \frac{x - x_{min}}{x_{max} - x_{min}}$. The evolution of the politicisation of renewable energy is shown in Figure 6, which clearly showcases the high salience of renewable energy in 2022.

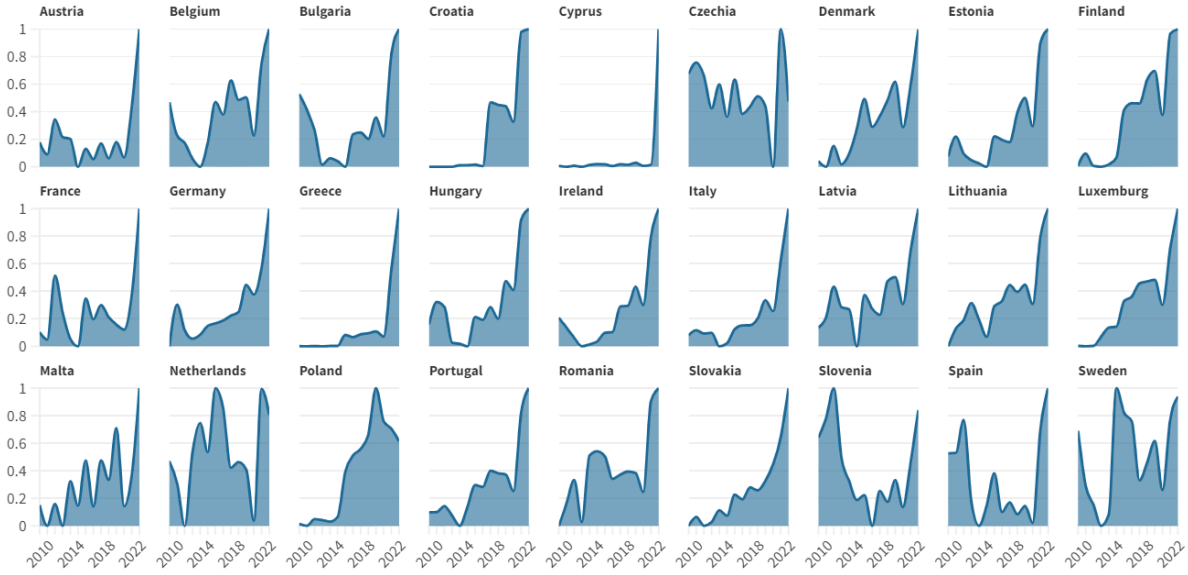

Figure 6 **Politicisation trends across EU Member States.**

[10] This method implies that the sum of each variable value was multiplied by the weight of the dimension, divided by the number of indicators in the dimension. The overall index value is obtained by summing the contributions of salience and polarisation.

In analogy with previous research (De Bruycker, 2019), the politicisation variable operates through a one-year time lag. This is based on the theoretical ground that policy responsiveness posits that change in politicisation induces subsequent policy changes in the same direction (Hakhverdian, 2012). A time lag allows for ensuring causality from politicisation to responsiveness, while actively minimising risks of endogeneity between both variables.[11] This is specifically useful when working with panel data in a Fixed Effects TSCS model (cf. infra). The same time lag was applied to other independent variables, as responsiveness implies to be a post-factum phenomenon. Other variables were used to control for different factors relating to climate and energy, the economy, as well as governance and political-institutional factors across EU MS.

3.2.3 Control variables

One of the other main variables that should be discussed is customisation, as an enabler of DPI. This variable also relied on primary data collection in the form of a limited desk research, of which the process is outlined in Appendix 3. In short, data was collected on customised restrictiveness only, as it was earlier described how restrictiveness emphasises the regulation's content over the number of rules it encompasses in density (Thomann, 2015), i.e., outcome over output. In terms of content, only RED provisions on binding national targets and support schemes for renewable electricity (RES-E) were considered. These two were chosen respectively due to political and broader EU policy significance (Brendler & Thomann, 2023).[12] IEA's Energy Policy Reviews (OECD, n.d.) and Policies Database (IEA, n.d.) were used in combination with RES LEGAL Europe's online database on RES policy (RES LEGAL Europe, n.d.) in order to collect data on national measures. Following the data processing seen in Appendix 3, customisation data was pooled by country as a constant and has as such become a time-invariant control variable with values ranging between 0 and 2.5. Therefore, this variable will not be lagged in time.

In line with previous research in the literature, other control variables were also considered to account for differentiation across European countries. Echoing Apergis and Pinar (2021), I control for GDP per capita data collected from Eurostat (2023d), as this might affect energy consumption patterns, investment capacities, economic strength, etc. From the World Bank's World Development Indicators (WB, n.d.-a), data was collected on the inflow of Foreign Direct Investments [FDI]. This variable could be especially relevant in the emerging political economy surrounding RE within a dual context of combating climate change and a newfound industrial competition in 'cleantech' (cf. supra). Incoming FDI may incentivise RE development through, e.g., knowledge, technology, and capital spillovers (Hamid et al., 2022; Kiliçarslan, 2019). I am also controlling for an interaction term between a country's debt to GDP ratio and its share of GDP attributed to government investment expenditure, collected from Eurostat (2023a-c). These variables can yield insights into a government's economic readiness and fiscal space to invest in renewable energy, possibly affecting policy responses to economic conditions.

In terms of governance and the political-institutional level, I controlled for multiple variables that address concerns for endogeneity since they affect both independent and dependent variables. From the World Bank's [WB] Worldwide Governance Indicators [WGI] (WB, n.d.-b), data was collected on government effectiveness, regulatory quality, strength of the rule of law, and government accountability. These variables provide substantial insights into the institutional context where EU renewable energy policy is

[11] Endogeneity can arise when politicisation affects policy responsiveness which then, in turn, affects politicisation.

[12] Where binding targets are always a political hardship and the most concrete way to show political output, RES-E support schemes have broader significance as they also influence the EU's internal market and potentially inter-EU cooperation between Member States. Within the context of this research, RES-E was deemed most relevant out of the three sectors (electricity, transport, and heating) due to the electrification rush in the energy transition and the decarbonisation potential in the power sector.

implemented and can influence implementation and enforcement capacity. Controlling for these variables can yield important policy implications, by identifying governance factors that contribute to effective renewable energy policy implementation and thus a responsive government. Finally, I controlled for the political majority a government has in parliament as an indication of how strong said government is and whether is has the political capacity to be responsive to public pressures. Data for this variable was collected from the most recent Database of Political Institutions (Scartascini et al., 2021).

Finally, within the framework of energy security, I controlled for the degree of energy import dependency on third (non-EU) countries and installed renewable capacity. These variables are collected from Eurostat (2023b) and the International Renewable Energy Agency [IRENA] (n.d.). Higher import dependency may drive governments to prioritise RE policy as a means to reduce reliance on external energy sources. Higher installed renewable capacity, on the other hand, reflects RE potential to diversify energy supply and indicates progress in implementing RE policy to drive energy security and move beyond fossil fuels. Appendix 4 provides an overview of all described variables and the hypotheses they are linked to.

3.3 Data Analysis: Model Specifications and Robustness Checks

Given the use of longitudinal and cross-sectional panel data, this study employs Fixed Effects TSCS [Time Series and Cross Sectional] regression methodology to address its research questions. This method is specifically applicable where measurement surpasses different entities over multiple time periods (Bell & Jones, 2014). Since politicisation varies over time and this study is interested in within-entity variation, a Fixed Effects [FE] model assesses the net effect of the predictors on the outcome variable without the effect of other unobserved, time-invariant between-entity heterogeneity that might impact the relationship (Qin & Al Amin, n.d.; Baltagi, 2021; Bartels, 2008). All things considered, the baseline regression equation for this study is the following, where *k* is the remaining number of predictors, *X'* is the vector of remaining independent variables, and *α* represents country and time fixed effects capturing unobserved heterogeneity:

$$\text{responsiveness}_{it} = \beta_0 + \beta_1\ \text{politicisation}_{(it-1)} + \beta_2\ \text{custrest}_{it} + \ \ldots + \beta_k\ X'_{(it-1)k} + \alpha_{it} + \varepsilon_{it}$$

With the goal of achieving an iterative, yet comprehensive analysis of how politicisation conditions policy responsiveness, a series of FE panel regression models were estimated using the *plm* package in R (Croissant & Millo, 2008). Each model is designed to explore the research question's various dynamics. Model 1 [M#] isolates politicisation and the share of RE to analyse the direct impact of politicisation on responsiveness without any confounding effects. M2 tests if there is a mediating effect for customised restrictiveness within the context of DPI. M3 provides a first set of controls within the context of economic turbulence, a factor that can influence a country's ability and willingness to adopt and invest in renewable energy policies. M4 further contextualises the analysis by controlling for how political, institutional, and energy security dynamics interact with politicisation and policy outcomes. Finally, M5 offers a holistic analysis with all controls to discern distinct influences of each dimension. In each model, theoretically sound interactions are included to capture the full range of potential confounders. Table 1 provides a descriptive summary of all independent variables. It was coded to neglect missing values present due to certain data not being available for a given year. Positive skewness indicates a left-leaning distribution, while positive kurtosis values indicate that the distribution has heavier tails and is more peaked. As this table and Appendix 5 indicate, the dataset regularly departs from normal distribution indicating the presence of potential outliers. Since these genuine outliers represent natural variations in the population's varying policy contexts, outliers are kept in the dataset (Ghosh & Vogt, 2012).

	N	Mean	Median	SD	Min	Max	Skewness	Kurtosis
politicisation	378	0.3280	0.2562	0.2998	0.0000	1.0000	0.89	-0.19
custrest	378	1.1865	1.0000	0.7267	0.0000	2.5000	0.41	-0.72
gdppc	378	25827	20620	16964	4970	84750	1.53	2.76
fdinflow	351	10.07%	2.73%	34.07	-117.42%	279.35%	4.23	26.38
debttogdp	377	67.67%	60.60%	37.92	6.20%	206.30%	0.98	0.94
govinvest	346	3.70%	3.66%	1.08	1.54%	6.64%	0.32	-0.46
goveffect	351	1.0814	1.0569	0.5709	-0.3716	2.2350	-0.20	-0.58
regqual	351	1.1555	1.1253	0.4558	0.1444	2.0455	0.00	-1.06
ruleoflaw	351	1.0954	1.0603	0.6008	-0.1472	2.1248	-0.16	-1.01
voiceacc	351	1.0814	1.0642	0.3486	0.2620	1.6904	-0.33	-0.66
govmaj	324	55.41%	54.76%	8.67	25.33%	79.87%	-0.16	1.03
energydep3	324	46.01%	44.94%	19.09	10.03%	86.72%	0.16	-0.89
recapacity	378	14233.95	4529.94	23280.61	0.80	148377.50	2.86	9.64

Table 1 **Descriptive statistics for all independent variables included in regression models.**
Note. Accentuated skewness values are scrutinised further in Appendix 5.

As the FE model is based on panel data within a large-n case selection, the EU27 research units exhibit significant heterogeneity in various time-invariant aspects. Such heterogeneity affects error terms in statistical models, to the extent that they might have different variances across research units. In turn, unobserved heterogeneity may not be consistent across all units, implying a risk of heteroscedasticity and autocorrelation (Bailey & Katz, 2011). Ordinary Least Squares [OLS] assumes homoscedasticity, i.e., that error variances and thus unobserved variances are constant across observations. Therefore, when heteroscedasticity is present, model parameters may no longer be efficient due to invalid standard errors. This can also be related to spatial contemporaneous autocorrelation, when there are unobserved spatial dependencies in the data and error terms are correlated (Beck & Katz, 1995; Sun, 2014). Another issue that may arise is that of multicollinearity, when two or more independent variables are highly correlated which can make it difficult to determine individual effects on the dependent variable. Figure 7 already succeeds in exposing high correlations with and between the WGI indicators, otherwise high correlations are a rarity.

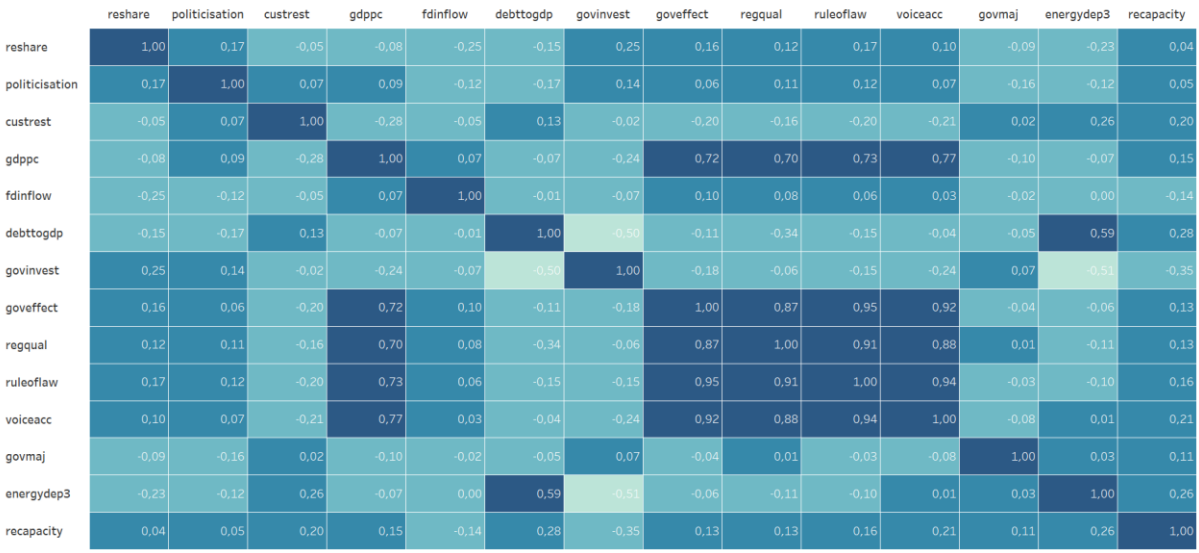

Figure 7 **Correlation values across all variables, visualised in a correlation matrix.**

Since the collected data fails to meet some core regression assumptions, the regression's estimates are at risk of being misleading. Every issue is a threat to the internal validity of the study. Therefore, each issue was tested and formalised through specific procedures for all models. Heteroscedasticity and autocorrelation were tested through the Breusch-Pagan and Breusch-Godfrey tests respectively using the *plm* package (Croissant & Millo, 2008; Breusch & Pagan, 1979; Breusch, 1978; Godfrey, 1978). The Breusch-Pagan test determines if the variance of the residuals in a regression model is constant across independent variables. As displayed in Table 2, there is no significant evidence of heteroscedasticity, yet there is strong evidence of first-order autocorrelation in the residuals of all models, violating the assumption. To test for multicollinearity, I echoed Sun (2014) in using a Variance Inflation Factor [VIF] test, provided in Table 2. For each of the models, a test was performed and mainly the WGI variables pose a serious multicollinearity problem with values rising above 4 and most often above 10 (Belsley et al., 1980 indicate a threshold of 10; Rogerson, 2001 is more conservative with a threshold of 4).

Breusch-Pagan [Heteroscedasticity]	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Coefficient	0.0318	0.0222	0.3864	0.9364	0.5933
p-value	0.8584	0.8815	0.5342	0.3332	0.4411
Breusch-Godfrey [Autocorrelation]	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Coefficient	301.79	299.57	262.42	267.30	188.19
p-value	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16
VIF [Multicollinearity]	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Politicisation [*politicisation*]		1.0000	1.0452	1.1057	1.2045
Customised Restrictiveness [*custrest*]		1.0000		1.0576	1.4860
GDP per capita [*gdppc*]			1.0881		4.5540
Inflow of FDI [*fdinlow*]			1.0482		1.1020
Debt-to-GDP & Government investment [*debttogdp:govinvest*]			1.2150		2.0244
Non-EU Energy Dependency [*energydep3*]			1.2439		1.5961
Renewable capacity [*recapacity*]			1.1343		1.7899
Government effectiveness [*goveffect*]				11.3263	11.9735
Regulatory quality [*regqual*]				5.9770	8.9990
Rule of law [*ruleoflaw*]				17.5918	18.5583
Voice & accountability [*voiceacc*]				12.0067	12.1209
Government majority [*govmaj*]				1.0946	1.1374

Table 2 **Results of Breusch-Pagan, Breusch-Godfrey, and Variance Inflation Factor tests.**

To address the issue of multicollinearity among the WGI, a factor analysis revealed a latent factor that effectively captures the shared variance among all four variables. The factor consolidates the effects of the correlated variables, and its scores were computed for each observation in the dataset using the *psych* package (Revelle, 2023). The WGI factor thus effectively replaced the separate variables in their respective models. Further, to address autocorrelation, I followed the Beck and Katz standard which involves adding a lagged dependent variable $reshare_{it-1}$ in the regression equation to solve temporal dependence (Plümper et al., 2005, p. 328-329; Bailey & Katz, 2011). Further information on how autocorrelation was dealt with can be found in Appendix 6. However, social processes are often dynamic in the sense that previous outcomes feed back into current outcomes. To avoid serial correlation in a standalone $reshare_{t-1}$, it is consistently included in interaction with $politicisation_{t-1}$ to capture potential joint influence of both past renewable shares and politicisation. Following this approach, risks of both endogeneity and autocorrelation are reduced.

4 RESULTS

Following the robustness adjustments made through the previous section, the panel regression models in Table 3 provide the summaries for each updated model. As a recap, Model 1 (M1) isolates politicisation and the share of renewables as a baseline which is extended by including customised restrictiveness in Model 2. Models 3 and 4 then contextualise the primary variables by including economic, political-institutional, and energy security factors that could influence both capacity and willingness to increase renewable energy shares. Model 5 provides a culmination of all controls for a comprehensive analysis.

	M1	M2	M3	M4	M5
politicisation$_{t-1}$	-0.010 (0.008)	**0.025*** **(0.014)**	-0.012 (0.008)	**0.027*** **(0.015)**	**0.024*** **(0.014)**
politicisation$_{t-1}$ * reshare$_{t-1}$	**0.085***** **(0.032)**	**0.067**** **(0.032)**	**0.095***** **(0.031)**	**0.075**** **(0.032)**	**0.081**** **(0.031)**
politicisation$_{t-1}$ * custrest		**-0.022***** **(0.007)**		**-0.026***** **(0.008)**	**-0.025***** **(0.007)**
gdppc$_{t-1}$			0.00000 (0.00000)		-0.00000 (0.00000)
fdinflow$_{t-1}$			**-0.011***** **(0.003)**		**-0.008**** **(0.003)**
debttogdp$_{t-1}$			0.023 (0.016)		0.009 (0.019)
govinvest$_{t-1}$			**0.720***** **(0.257)**		0.329 (0.281)
debttogdp$_{t-1}$ x govinvest$_{t-1}$			**-1.162***** **(0.327)**		**-0.838**** **(0.354)**
WGI$_{t-1}$				**-0.016**** **(0.006)**	**-0.018***** **(0.007)**
govmaj$_{t-1}$				**-0.024*** **(0.013)**	-0.021 (0.013)
energydep3$_{t-1}$				-0.003 (0.017)	-0.003 (0.018)
recapacity$_{t-1}$				-0.00000 (0.00000)	-0.00000 (0.00000)
energydep3$_{t-1}$ x recapacity$_{t-1}$				0.00000 (0.00000)	0.00000 (0.00000)
N = Observations	324	324	320	297	293
R^2	0.034	0.064	0.110	0.105	0.159
Adjusted R^2	-0.099	-0.068	-0.033	-0.052	-0.011
F-statistic	**4.957*****	**6.448*****	**4.836*****	**3.683*****	**3.527*****

Note: *p<0.1; **p<0.05; ***p<0.01.

Table 3 **Summary of Panel Regression Models.**

Starting with parameters for goodness of fit, the consistently significant F-statistic rejects the null hypothesis that an intercept-only model would perform as well as the provided models. This formal statistical test shows that all predictors are jointly significant. However, as an indication of to what degree the predictors collectively explain variance in the dependent variable, R^2 consistently carries a relatively low value. Especially when adjusted for the number of predictors, the adjusted R^2 suggests these models are not accounting for much variance in the outcome, and the association between the predictors and the outcome can be stronger. Hence, it is noteworthy that the share of renewables in a country's energy mix is a significantly more complex phenomenon than what can be captured by the included variables.

The panel regression models reveal findings generally in favour of a positive and significant impact of politicisation on the outcome variable of renewable energy shares. In other words, based on the aggregate view of this panel regression, higher degrees of lagged politicisation are indeed associated with higher degrees of RE in a country's energy mix. Only when isolating politicisation and the outcome, and when only controlling for economic factors, politicisation is negatively associated with the outcome and thus could constrain responsiveness, but these results lack statistical significance. Moreover, an interaction term between lagged politicisation and lagged renewable share values shows a highly significant and positive association across all models. Hence, we can cautiously accept the politicisation-responsiveness hypothesis, when controlling for different contextual factors. The introduction of customised restrictiveness under politicisation brings forward a noteworthy association. When this variable is included (Models 2, 4 and 5), lagged politicisation consistently carries a significant and positive coefficient. However, the inclusion of customisation has a negative effect, as its interaction with lagged politicisation is negatively and significantly associated with the outcome across models. Since the customisation hypothesis expects a positive effect of customised restrictiveness on practical implementation, these regression results reject the hypothesis.

Upon incorporating contextual variables, the remaining models underline the relevance of both economic and political-institutional variables. While the effect of GDP per capita can be neglected in both M3 and M5, other indicators of economic readiness provide significant associations with the outcome. This includes a strong and significant positive effect of the degree of government investment, yet the same variable in interaction with the debt-to-GDP ratio provides an even stronger significant yet negative effect. This implies that, ceteris paribus, government investment can increase renewables, yet investment restrictions due to a higher debt-to-GDP ratio is more likely to constrain renewable shares. As such, the economic readiness hypothesis can be accepted. Furthermore, both the WGI factor and government majority are observed as negatively associated predictors. Arguably even more notable is that both energy security dimensions have negligible predicting effects. Therefore, neither the governance part nor the energy security part of the political-institutional capacity hypothesis can be confirmed through these models. Variables on government majority and investment lost their significant associations in Model 5. This model controlled for all variables and thus captured the most variance in the outcome variable. However, a relatively low R^2-value still suggests this model is not the most effective for predicting policy responsiveness. It is further remarkable that the strongest effects in these models (*govinvest*$_{t-1}$ and its interaction with *debttogdp*$_{t-1}$) also have the largest standard errors (see Figure 8).

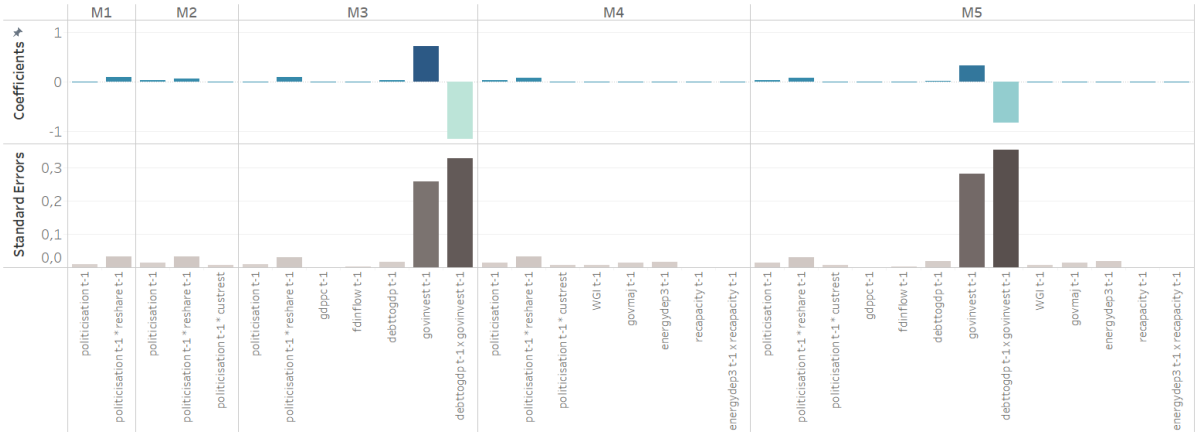

Figure 8 **Panel regression model performance in terms of coefficients and standard errors.**

Therefore, robustness checks were conducted by applying panel-corrected standard errors [PCSE] through the *vcovBK* function in R's *plm* package. PCSE assumes the inclusion of a lagged dependent variable to solve temporal dependence, aims to verify a model's stability and to make the analysis more robust to non-spherical errors such as autocorrelation (Bailey & Katz, 2011). Table 4 provides the summary for these PCSE-adjusted models.

	M1	M2	M3	M4	M5
politicisation$_{t-1}$	-0.010 (0.013)	0.025 (0.023)	-0.012 (0.012)	0.027 (0.021)	0.024 (0.020)
politicisation$_{t-1}$ * reshare$_{t-1}$	**0.085*** **(0.043)**	0.067 (0.041)	0.095 (0.040)	0.075 (0.038)	**0.081*** **(0.037)**
politicisation$_{t-1}$ * custrest		-0.022 (0.013)		**-0.026*** **(0.012)**	**-0.025*** **(0.036)**
gdppc$_{t-1}$			0.000 (0.000)		0.000 (0.000)
fdinflow$_{t-1}$			**-0.010*** **(0.005)**		-0.008 0.005)
debttogdp$_{t-1}$			0.023 (0.024)		0.009 (0.025)
govinvest$_{t-1}$			**0.720*** **(0.342)**		0.329 (0.035)
debttogdp$_{t-1}$ x govinvest$_{t-1}$			**-1.161**** **(0.431)**		-0.838 (0.432)
WGI$_{t-1}$				-0.016 (0.010)	-0.018 (0.010)
govmaj$_{t-1}$				-0.024 (0.019)	-0.021 (0.017)
energydep3$_{t-1}$				-0.003 (0.023)	0.003 (0.020)
recapacity$_{t-1}$				-0.000 (0.000)	-0.000 (0.000)
energydep3$_{t-1}$ x recapacity$_{t-1}$				-0.000 (0.000)	-0.000 (0.000)
N = Observations	324	324	320	297	293
R^2	0.034	0.064	0.110	0.105	0.159
Adjusted R^2	-0.099	-0.068	-0.033	-0.052	-0.011
F-statistic	2.786	2.679	**2.609***	1.803	1.766
					Note: *p<0.1; **p<0.05; ***p<0.01

Table 4 **Panel Regression summary adjusted for panel-corrected standard errors (PCSE).**

The PCSE models broadly show the same patterns as seen in the summary in Table 3, but a general trend here is that coefficients are less strong and mostly at lower significance levels. With PCSE, politicisation in itself is no longer a significant predictor, but it is in interaction with past renewable shares and customisation. It is also notable that other predictors become insignificant except for the inflow of FDI, government investment, and its interaction with debt-to-GDP ratio. However, similar to political-institutional factors, they become insignificant in the final model. Using PCSE nuances the validity of both the hypotheses and of the models in general. Moreover, the issue raised in Figure 8 still persists even when corrected. Nevertheless, the relevant findings will be discussed further in the next section.

5 DISCUSSION AND IMPLICATIONS

The results convey both expected and unexpected findings within the premises of this study's research question and hypotheses. In this section, we delve into the implications of the panel regression analyses and draw connections to the theoretical framework.

5.1 Politicisation potential and unexpected restrictiveness

First, it is striking that the impact of politicisation primarily depends on the variables with which it interacts. While politicisation in itself mainly came out as a positive impact on the share of renewables, its most significant contributions are in interaction with either past renewable shares or customised restrictiveness. For instance, the strong effects of the interaction between politicisation and renewable shares have important implications. When there is already stronger renewable momentum, i.e., when $reshare_{t-1}$ is higher, stronger politicisation of RE enables its development even further. When isolated in Model 1, although this finding was not significant across models, politicisation was more likely to constrain growth in renewables – redeeming the constraining dissensus proposition of Mark and Hooghe (2009). However, when renewable momentum is there, the enabling dissensus comes into play (Bressanelli et al., 2020; Ferrara & Kriesi, 2022).

The potential impact of politicisation on policy outcomes is thus at least partially dependent on the momentum a policy issue has gathered. As momentum can in itself be a function of both bottom-up and top-down politicisation, this finding suggests that bottom-up politicisation can also drive sustainable transformation in the EU. This demonstrates the democratic potential of politicisation, proving policy change is not merely a top-down process. However, when politicisation interacts with customised restrictiveness, the dynamics change against my customisation hypothesis and the premises of differentiated policy implementation Zhelyazkova & Thomann, 2022; Thomann & Zhelyazkova, 2017). Its unexpectedly strong negative associations suggest customisation to constrain practical implementation rather than improve it. This could be caused by a myriad of factors at the domestic level such as divergence in policy preferences when transposing European legislation or bureaucratic hurdles when implementing transposed legislation. However, this discrepancy between theory and empirical findings highlights a need for further exploration of the relatively novel concept of customisation.

These findings provide grounds to cautiously accept the politicisation-responsiveness hypothesis, yet a nuance should be made that politicisation enables responsiveness in the right conditions. For this study, the customisation hypothesis can be rejected, yet further exploration is needed.

5.2 Economic factors prevail over political-institutional factors

Politicisation does not act in isolation and is subject to its context. Therefore, contextual variables on both economic and political-institutional factors were included. With PCSE, economic factors are the only significant controlling variables, yet political-institutional variables should not be neglected. The factor resulting from the WGI as an aggregate indicator for institutional quality provided, unexpectedly, a negative association with renewable energy shares. The same was found for the government majority variable. While the latter could be explained by the notion that larger governments may find it harder to come to compromises about policy outcomes than smaller governments, a negative impact of higher institutional quality is harder to explain and warrants further exploration. One possible interpretation to this finding could hint at how institutional quality does not automatically facilitate greater policy outcomes. In contexts with high institutional quality, regulatory and decision-making processes might

be more rigorous and change resistant. Policy change may thus, especially in a politicised context, be slower and more cautious here while a politicised policy issue may actually benefit more from flexible decision-making.[13] Even more remarkable, however, is that neither energy dependence nor RE capacity, two dimensions of energy security, are significantly contributing to a higher share of renewables. While energy security is arguably more salient at time of writing than before Russian aggression in Ukraine, these findings still challenge contemporary trajectories that challenges to energy security would increase the deployment of renewable energy.

Lastly, the economic context might just have the upper hand in predicting renewable policy outcomes. When controlling for all variables, one can observe the critical importance of a country's economic readiness to invest in renewables. The inflow of FDI has an unexpected negative impact on the outcome, which could be attributed to keeping outliers (in this case most clearly Cyprus and Luxembourg) in the dataset. Since this result may be founded in a lot of reasons such as conflict of interests between private profit maximisation and public energy policy goals, further exploration of this topic is necessary. More clearly, the expectation that a country's economic readiness (the interaction between a country's debt-to-GDP ratio and its public investments) is vital to policy responsiveness came true for this case. This is by far the strongest effect in the regression models, which implies that fiscal space to enable public investment is crucial in increasing the share of renewables. The share of government investment in itself is also an important predictor, especially in the economic readiness models. This finding brings important policy implications, as the sustainable transition will require rapid increases in public investment (see, e.g., Wildauer et al., 2021; Taghizadeh-Hesary & Yoshino, 2020), and restricted fiscal space is shown here to hamper the sustainable policy outcomes of increased renewable energy.

Given these findings, the economic readiness hypothesis can be accepted. While the role of FDI is still up for discussion, fiscal capacity to invest in the sustainable transition is vital for enhancing policy outcomes and thus policy responsiveness. Finally, the political-institutional capacity hypothesis cannot be accepted since neither energy security nor governance capacity dimensions proved to increase RE. Given the complexity of politicisation as a social phenomenon and of the energy transition as a policy goal, a great deal of intricate dynamics is at play. Therefore, while the results indicate a positive impact of politicisation on policy responsiveness, politicisation does not operate in isolation and more in-depth analysis of these dynamics are warranted.

[13] A recent example of how the energy transition needs more flexible decision-making and regulatory processes is on regulatory permitting for the deployment new renewable energy projects (Simon, 2022; Randle & Brownlow, 2023).

6 CONCLUSIONS AND RECOMMENDATIONS

This research has investigated the extent to which politicisation conditions policy responsiveness in European renewable energy policy. European policymaking is increasingly a case of *policy with politics* and renewable energy is making waves in energy policy. A literature study proved that both politicisation and renewable energy are as relevant as ever within the context of Europe's polycrisis. Nonetheless, the link between both has rarely been studied systematically. While politicisation is often portrayed to constrain policymaking, this study rather proposes its enabling impact on European policy outcomes. Here, the concept of policy responsiveness comes into play. Through an outcome-oriented approach, responsiveness is coined as the convergence between public preferences and policy outcomes. Since energy security and mitigating the climate crisis is generally seen as a public concern among European citizens, an uptake in renewable energy would count as a responsive policy outcome. Leveraging a synthesis of post-functionalism, responsiveness theory and differentiated policy implementation, the connection between politicisation and renewable energy was elaborated through national discretion and customisation in transposing EU legislation to empower responsive policy outcomes.

EU MS have heterogeneous contexts and both the degree of politicisation as well as its impact differs across countries. Therefore, a cross-sectional and longitudinal research design was employed. Data was collected on various dimensions of politicisation and contextual variables to shape the policy outcome, for the EU27 across a period from 2009 until 2022. This data was then analysed using fixed effects panel regression models in order to obtain generalised findings while accounting for unobserved heterogeneity across Member States. The analysis was built on four hypotheses, each forming a basis for iterative expansion of the regression models. The first two hypotheses expected a positive impact of respectively politicisation and customisation on the policy outcome of renewable energy uptake. The last hypotheses contextualised the analysis by emphasising variables on economic readiness to invest in the energy transition on the one hand, and the political-institutional capacity to do so on the other.

The results showed how politicisation indeed enables stronger policy outcomes, although primarily in enabling contexts. After robustness checks, the positive impact of politicisation was mainly found in interaction with past levels of renewable energy. This implies that for politicisation to drive policy responsiveness, the policy issue in question had better already gathered some momentum. This momentum can originate in both bottom-up and top-down politicisation, suggesting that bottom-up politicisation can also drive sustainable policy outcomes in the EU. This demonstrates the democratic potential of politicisation, proving policy change is not merely a top-down process and public preferences should be dynamically considered, rather than only after the aggregation of public opinion during elections. Moreover, since renewables are part of the solution to the wicked problem of climate disruption, this finding can be extrapolated to other dimensions of sustainable transformation (e.g., nature restoration). From this finding, it can be recommended that policymakers empower features of participative democracy so politicised policy issues can find their way into the policymaking venue easier.

Another important contribution to the literature is the finding that customised restrictiveness is, unexpectedly, negatively associated with stronger policy outcomes. My findings contradict current theory that customised restrictiveness, i.e., the domestic changes in the content of a European Directive, would improve practical policy implementation. Whereas this is not further elaborated here, future research is warranted to investigate which domestic factors (e.g., mismatch in policy goals after European adoption or bureaucratic difficulties in implementation) may lead to this divergence or to disprove this finding. The customisation hypothesis could thus not be confirmed based on this analysis.

Given the heterogeneous contexts across the EU27 and the fact that politicisation is not an isolated phenomenon, economic and institutional contexts were also analysed for a comprehensive analysis. Economic considerations prevailed over political-institutional variables in the results, although the latter brought interesting findings as well. Both the size of a government's majority and an aggregate factor on institutional quality brought negative associations with the outcome variable. These findings can be interpreted to imply that sizeable governments and rigorous decision-making processes do not necessarily facilitate the flexible decision-making sustainable transformation, including the energy transition, would benefit from – especially in a politicised context. While the value of institutional quality cannot be underestimated, these findings suggest that policymakers should find a balance between change-resistant procedures and change-enabling flexibility to drive sustainable transformation.

A similar policy recommendation can be made on the back of the findings from economic considerations. The strongest economic effects were contributed by variables on government investment and debt-to-GDP ratios, proving how adequate fiscal space to enable public investment in renewables is crucial in enabling the required policy outcomes. Since sustainable transformation will require rapid increases in public investment, an important policy recommendation is to not restrict investment capacity based on fiscal space alone. A multiplicity of cost pressures will likely politicise issues and drag up debt-to-GDP ratios. However, as restricted fiscal space is proven here to be a barrier to sustainable policy outcomes, fiscal policy ought to be compatible with sustainable transformation (see e.g., Krahé et al., 2023 for more). Finally, future research could further investigate how politicisation pressures affect important sustainable or green fiscal policy reforms in the EU to address the relationship between political dynamics and environmental policy objectives from a financial perspective.

While this study has brought thought-provoking findings, its limitations should also be discussed here. For instance, using panel data brought several methodological challenges to meet the classic assumptions of linear regression. Most notably, even with the robustness adjustments such as including a lagged dependent variable and employing PCSE, autocorrelation remained an issue. Whereas this is a threat to the internal validation of this study, enough steps were taken to mitigate this issue as much as possible. Data availability was also an issue in the case of the share of renewables. Due to the fact that 2022 data on this indicator was not present at the time of writing, there was an inherent temporal mismatch between the dependent and independent variables. Substantively, measuring policy outcomes remains a challenge too. Since the EGD has only been around for four years, it is still quite early to measure actual outcomes related to this critical juncture in European climate policy. Therefore, a future update of this study would be worthwhile, especially since it would be able to capture the full implications of the year 2022 that might become a pivotal year in European energy security.

In conclusion, this study provides a comprehensive understanding of how politicisation conditions policy responsiveness in itself, but also in interaction with various contextual factors. Based on the results, attempting to give a one-size-fits-all answer to the research question would discredit the complexity of the intricate dynamics between all relevant dimensions of analysis. However, it can be stated that politicisation does condition policy responsiveness, yet the extent to which it does is contingent upon various contexts and interactions with other factors. Nevertheless, where policy meets politics, sustainable outcomes are one step closer to the imperatives of both society and our planet's well-being.

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APPENDICES

Appendix 1: Descriptive summary of share in % of domestic energy mix

For the dependent variable, a proxy variable was taken in order to capture policy outcomes of renewable energy policy. The choice went to the share of renewable energy as a percentage of the total domestic energy mix. This indicator was deemed as the most appropriate variable for cross-country comparison due to its standard scale in percentage. The table below provides a descriptive summary of this variable.

MS	N	Mean	Median	SD	Min	Max	Range	Q1	Q3	IQR
EU	**351**	**20.04%**	**17.27%**	**11.65%**	**0.22%**	**62.57%**	**62.35%**	**11.69%**	**26.44%**	**14.76%**
Austria	13	33.33%	33.37%	1.69%	31.04%	36.55%	5.51%	32.67%	33.76%	1.09%
Belgium	13	8.55%	8.06%	2.45%	4.75%	13.01%	8.27%	7.09%	9.47%	2.39%
Bulgaria	13	17.77%	18.26%	3.19%	12.01%	23.32%	11.31%	15.84%	18.90%	3.06%
Croatia	13	27.70%	28.04%	2.18%	23.60%	31.33%	7.73%	26.76%	28.47%	1.71%
Cyprus	13	10.47%	9.83%	4.10%	5.92%	18.42%	12.50%	7.11%	13.78%	6.67%
Czechia	13	14.18%	14.93%	2.47%	9.98%	17.67%	7.69%	12.81%	15.14%	2.33%
Denmark	13	29.41%	30.47%	5.47%	19.95%	37.02%	17.07%	25.47%	34.39%	8.92%
Estonia	13	28.29%	28.99%	3.93%	23.01%	38.01%	15.00%	25.52%	29.97%	4.46%
Finland	13	38.10%	38.94%	4.41%	31.05%	43.94%	12.89%	34.22%	41.19%	6.96%
France	13	15.02%	14.80%	2.56%	10.81%	19.34%	8.53%	13.24%	16.38%	3.15%
Germany	13	14.93%	14.89%	2.60%	10.85%	19.17%	8.32%	13.55%	16.66%	3.11%
Greece	13	15.72%	15.68%	4.12%	8.73%	21.93%	13.20%	13.74%	18.00%	4.26%
Hungary	13	13.87%	13.97%	1.26%	11.67%	16.21%	4.53%	12.74%	14.50%	1.75%
Ireland	13	9.31%	9.08%	3.09%	5.24%	16.16%	10.92%	7.03%	10.94%	3.91%
Italy	13	16.66%	17.42%	2.43%	12.78%	20.36%	7.58%	15.44%	18.18%	2.74%
Latvia	13	37.57%	37.54%	3.47%	30.38%	42.13%	11.76%	35.71%	40.02%	4.31%
Lithuania	13	23.82%	24.70%	2.88%	19.64%	28.23%	8.59%	21.44%	25.75%	4.31%
Luxembourg	13	5.82%	4.99%	3.19%	2.85%	11.74%	8.88%	3.11%	7.05%	3.93%
Malta	13	5.54%	5.12%	3.66%	0.22%	12.15%	11.93%	2.86%	7.91%	5.05%
Netherlands	13	6.83%	5.71%	3.27%	3.92%	14.00%	10.08%	4.66%	7.39%	2.74%
Poland	13	12.21%	11.45%	2.47%	8.68%	16.10%	7.43%	10.96%	14.94%	3.98%
Portugal	13	28.75%	30.20%	3.61%	24.15%	33.98%	9.83%	24.60%	30.62%	6.02%
Romania	13	23.75%	23.89%	1.06%	21.74%	25.03%	3.29%	22.83%	24.48%	1.64%
Slovakia	13	12.39%	11.71%	2.96%	9.10%	17.41%	8.31%	10.35%	12.88%	2.53%
Slovenia	13	22.29%	21.97%	1.40%	20.77%	25.00%	4.24%	21.38%	22.88%	1.50%
Spain	13	16.33%	16.22%	2.60%	12.96%	21.22%	8.26%	14.24%	17.12%	2.88%
Sweden	13	52.47%	52.22%	4.87%	46.10%	62.57%	16.47%	49.40%	53.92%	4.51%

Table 5 **Summary of descriptive statistics for the dependent variable share of renewables in % (*reshare*).**

Appendix 2: Constructing the politicisation index

Politicisation is a multifaceted concept, one where its underlying dimensions can be measured in a myriad of ways. Politicisation has been operationalised quantitatively before, but more restrictive than in this thesis. In one of the older contributions on politicisation in the EU (Grande & Hutter, 2016), only one indicator for each dimension of politicisation was measured: number of articles for salience, non-governmental actor statements for actor expansion, and a measure of ideological polarisation. In later work, Hutter and Kriesi (2019, 2021) keep the same mass-media oriented strategy for salience but focus on core sentences rather than number of articles, yet the polarisation measure remains the same as well.

For this thesis, I contribute to the literature by being the first – to my knowledge – to construct a composite index for politicisation based on multiple variables for each dimension of salience and polarisation. While this is a more time-consuming task in terms of data collection, a composite index can provide a more holistic and comprehensive representation of the complexity that surrounds politicisation. Moreover, a composite index is relatively easy to comprehend and interpret. Finally, this method allows for standardisation of multiple variables, facilitating cross-country and longitudinal analysis. However, an index can also oversimplify complexity, on top of possible being regarded as subjective due to the researcher's choice of which variables to include. For this index, the choice was made to include data on both public opinion and political features to capture both bottom-up and top-down politicisation. The table below describes each variable that made it into the composite index.

VARIABLE	DESCRIPTION	SOURCE	LEVEL	FACTOR
SALIENCE				
re_euinvest	% of people agreeing the EU should invest in RES [or equivalent question in EB] or % of people in favour of subsidising RE to reduce climate change [ESS]	1. Eurobarometer [EB] 2. European Social Survey 8 [ESS]	Public	Investment
re_pricelimit	% of people agreeing that RE can limit price of energy consumption	EB	Public	Energy prices
re_security	% of people agreeing that RE is important for overall security	EB	Public	Security
energypp	% of people agreeing that rising energy prices due to the crisis has a significant impact on purchasing power [EB] or % of people worried energy is too expensive for many people [ESS]	1. EB 2. ESS	Public / Economy	Energy prices
energyprice_n	Annual average price of wholesale electricity prices, absolute values.	EUR/Mwhe	Economy / Energy	Energy prices
nwsarticles	Number of articles mentioning renewable energy in a major national newspaper	Primary data collection [see Appendix 3]	-	Importance
POLARISATION				
climaproblem	% of people agreeing that climate change is a serious problem (6-10 in scale)	EB	Public	Problem definition
commonenergy	% of people in favour of a common European energy policy, and thus for EU RE policy	EB	Public	Responsibility

re_targetsetting	% of people thinking that it is important their national government should set ambitious RE targets	EB	Public	Problem definition
fossilreduce	% of people agreeing that reducing fossil fuel imports contributes to energy security and/or economic prosperity [or equivalent question in EB] or % of people worried their country is too dependent on fossil fuels [ESS]	1. EB 2. ESS	Public	Fossil fuels & renewables
envsaliencediff	Difference in highest and lowest attributed environmental salience between a country's governing parties in the given year	Chapel Hill Expert Survey	Political Institutions	Importance / Government
envdiff	Difference in highest and lowest attributed position on environmental sustainability between a country's governing parties in the given year	Chapel Hill Expert Survey	Political Institutions	Importance / Government
govherf	Herfindahl Index based on sum of the squared seat shares of all parties in the government	Database of Political Institutions 2020	Political Institutions	Government
govfrac	The probability that two deputies picked at random from among the government parties will be of different parties	Database of Political Institutions 2020	Political Institutions	Government

Table 6 **Variables part of the composite index on politicisation.**

In order to obtain a single politicisation measure that captures the different facets of both salience and polarisation dimensions, weighted sum aggregation methodology was used (Marler & Arora, 2004) where each dimension received an equal contribution of 50%. The originally calculated variable did not have a standardised scale, which did not allow for a fair analysis of politicisation across countries. Variables such as annual average wholesale electricity prices or the number of articles mentioning renewable energy differ largely across the EU. These two variables also have the strongest impact on the index due to naturally higher absolute values. Therefore, a normalisation formula was used to obtain a politicisation index ranging between 0 and 1 for each country, see below.

$$x_{norm} = \frac{x - x_{min}}{x_{max} - x_{min}}$$

Appendix 3: Primary data collection

nwsarticles: number of articles mentioning renewable energy

One of the six variables that constituted the salience dimension of the politicisation index measured the number of articles in a major national newspaper that mentioned the term "renewable energy." The table below provides an overview of each newspaper and the key word that was used to search the newspaper.

Member State	News Outlet	Keyword	Range of mentions
Austria	Der Standard	erneuerbare	114 (2018) → 377 (2022)
Belgium	De Standaard	hernieuwbare energie	142 (2013) → 386 (2022)
Bulgaria	Dnevnik	възобновяема	21 (2016) → 115 (2009)
Czechia	Lidové noviny	[Year] obnovitelná energie	72 (2016) → 173 (2010)
Denmark	Politiken	vedvarende energi	85 (2010) → 245 (2022)
Estonia	Eesti Päevaleht	taastuvenergia	17 (2017) → 94 (2022)
France	Le Monde	énergies renouvelables	244 (2014) → 612 (2022)
Germany	Süddeutsche Zeitung	erneuerbare	52 (2009) → 3151 (2022)
Greece	Kathimerini	ανανεώσιμος	247 (2021) → 533 (2022)
Hungary	Magyar Nemzet	megújuló energia	5 (2018) → 77 (2010)
Ireland	The Irish Times	renewable energy	205 (2012) → 870 (2022)
Italy	La Repubblica	energia rinnovabile	89 (2013) → 441 (2022)
Latvia	Diena	atjaunojamo energoresursu	12 (2017) → 72 (2011)
Lithuania	Lietuvos Rytas	atsinaujinančių išteklių	24 (2017) → 120 (2022)
Luxembourg	Luxemburger Wort	erneuerbare Energien + renouvelables	17 (2012) → 145 (2022)
Netherlands	NRC Handelsblad	duurzame energie	92 (2022) → 192 (2013)
Poland	Gazeta Wyborcza	odnawialna energia	24 (2010) → 708 (2019)
Portugal	Correio da Manhã	energia renovável	37 (2013) → 240 (2022)
Romania	Adevarul	energie regenerabilă	5 (2020) → 82 (2014)
Slovakia	aktuality.sk	obnoviteľné zdroje energie	18 (2009, 2011) → 185 (2022)
Slovenia	Dnevnik	obnovljiva energija	53 (2016) → 426 (2011)
Spain	El Mundo	energia renovable	132 (2018) → 424 (2011)
Sweden	Dagens Nyheter	förnybar energi + ren energi	66 (2012) → 201 (2014)

Table 7 **Summary of primary data collection for variable on number of news articles mentioning renewables.** *Notes*. In German-speaking countries, the term "*erneuerbare*" was used since "*erneuerbare Energie*" does not suffice – *"erneuerbare Quellen"* is also often used in the German language. Finland's main newspaper lacked a decent search engine where the same article showed up many times, and manual counting was too time-intensive. In Greece, none of the top three national newspaper had any search results for Greek translations. Only Kathimerini did in 2021 and 2022. In Luxembourg, for the years 2012, 2014 and 2016 the Luxembourgisch *"erneierbar Energien"* was recorded as well. In Spain, El Mundo was chosen, however El Pais is the most read newspaper in Spain but spans the whole Spanish-speaking world. Moreover, data was not collected for Croatia, Cyprus, and Malta due to malfunctioning search engines on their respective outlets' websites or due to translations resulting in no search results. Slovakia's and Slovenia's main newspapers had no decent search engine, so the high-traffic and reputable Slovakian website aktuality.sk and Slovenia's Dnevnik were used respectively. Data was collected between July 8 and July 10.

Finally, due to the differences in absolute numbers between countries, an attempt was done to calculate an alternative measure. Per country, I calculated for each year the share of articles of the total number of articles for that country. However, that alternative measure did not benefit the interpretation of the original politicisation index, nor did it help to observe a normal distribution. The raw data was not normalised, either, since that would reduce complexity too much. The choice was made to only normalise the composite index of politicisation to facilitate interpretation.

custrest: customised restrictiveness

Previous studies investigated customisation primarily using secondary data from EU commissioned conformity reports of how Member States transposed EU Directives (see Thomann & Zhelyazkova, 2017; Zhelyazkova et al., 2016). However, these conformity studies appeared to be primarily conducted for pre-Lisbon environmental directives. Therefore, they were not (publicly) available for the Renewable Energy Directive. Following the approach of Brendler and Thomann (2023), I collected customisation data myself using various sources.

In analogy to Brendler and Thomann (2023), I collected transposition data on two provisions in the RED: nationally binding targets and national RES-E support schemes. These provisions were chosen due to, respectively, political and broader EU significance. I employed the following scoring scales:

Binding targets	**RES-E support schemes**
0: No deviation	0: Relatively unchanged support
1: Slightly positive deviation (0.1 – 0.5 %)	1: Slightly more support, possibly to signal EU legal compliance
2: Moderately positive deviation (0.5 – 1.5 %)	2: Moderately more support, exceeding a signal to the EU and clearly more than baseline support
3: Significantly positive deviation (1.5 - … %)	3: Significantly more support with a great deal of more (intensive) support schemes
Thresholds based on actual data.	

Table 8 **Scoring scales for customisation measurement.**

The RED further imposed extensive reporting obligations on Member States through National Renewable Energy Action Plans (NREAPs). Data on binding targets came from Annex 1 of Directive 2009/28/EC (RED I) and the data collected on NREAPs by the EEA (2012). Since EU harmonisation efforts in terms of RE support schemes failed, I follow Brendler and Thomann (2023) by operationalising change in support schemes by comparing the most recent collection of support schemes to a pre-RED ex ante baseline. Moreover, customised restrictiveness always brings positive change since negative change would imply legal non-compliance to EU legislation. In order to determine baseline support schemes, the IEA's Energy Policy Reviews (OECD, n.d.) and Policies Database (IEA, n.d.) were used. The same sources were used in combination with RES LEGAL Europe's online database on RES policy (RES LEGAL Europe, n.d.) to collect data on current support schemes. RES LEGAL Europe's last contributions to their database are around 2018-2019. Therefore, both RED I and RED II are incorporated into the analysis. As RED II did not bring any binding requirements, this seemed the most appropriate way to also consider RED II. However, *custrest* was still adopted as a time-invariant variable due to challenges in attributing customisation values to a given year.

Member States were thus scored for both national targets and their support schemes. The value ultimately ending up in the dataset was the average score between both provisions. In 2009, i.e., the year of adoption of the RED, a value of 0 was assigned since customisation could not have happened yet.

Appendix 4: Hypotheses and variable description

The table below provides an overview of all described variables and the hypotheses they are linked to. The variable names are used throughout other tables in the study.

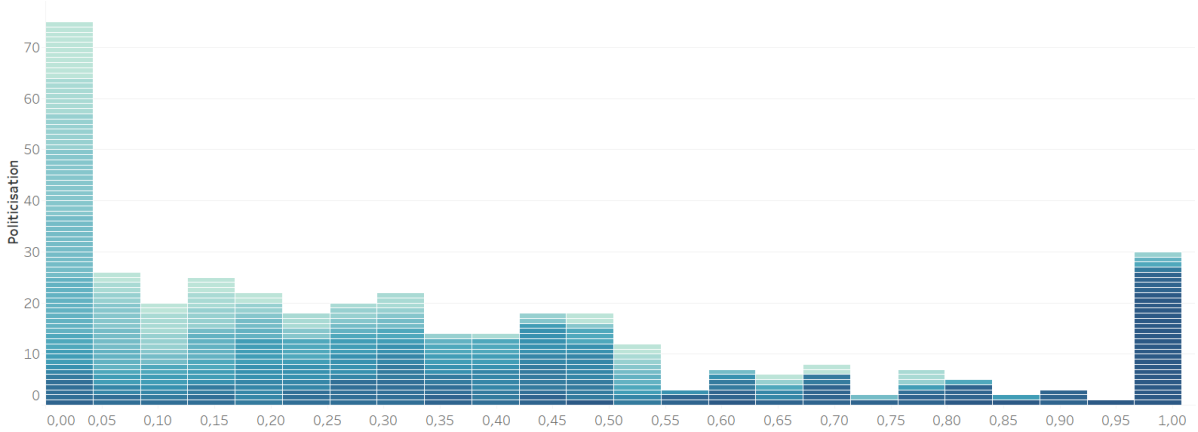
Hypothesis		Variables (description, source)
Politicisation-responsiveness hypothesis	Politicisation will enable rather than constrain policy responsiveness provided an enabling dissensus.	*Politicisation* (Appendix 2) *reshare* (share of RE in %, Eurostat)
Customisation hypothesis	In its interaction with politicisation, customisation will enable policy responsiveness due to national discretion and politicisation of the RED's content.	*custrest* (customised restrictiveness, Appendix 3)
Economic readiness hypothesis	Economic factors that could determine a country's capacity to invest in RE will be positively associated with policy responsiveness.	*gdppc* (GDP per capita, Eurostat) *fdinflow* (inflow of FDI, World Bank) *govinvest* (share of GDP to public investment in %, Eurostat) *debttogdp* (debt to GDP ratio as %, Eurostat)
Political-institutional capacity hypothesis	Factors related to governance capacity, institutional quality and energy security could determine a country's capacity and willingness to increase RE and will be positively associated with policy responsiveness.	*goveffect* (government effectiveness, World Bank) *regqual* (regulatory quality, World Bank) *ruleoflaw* (strength of rule of law, World Bank) *voiceacc* (strength of public's voice and government accountability, World Bank) *govmaj* (share of parliamentary seats held by government or the strength of its majority, Database of Political Institutions 2020) *energydep3* (energy dependence from third countries, Eurostat) *recapacity* (MW installed renewable capacity, IRENA)

Table 9 **Hypotheses and linked variables.**

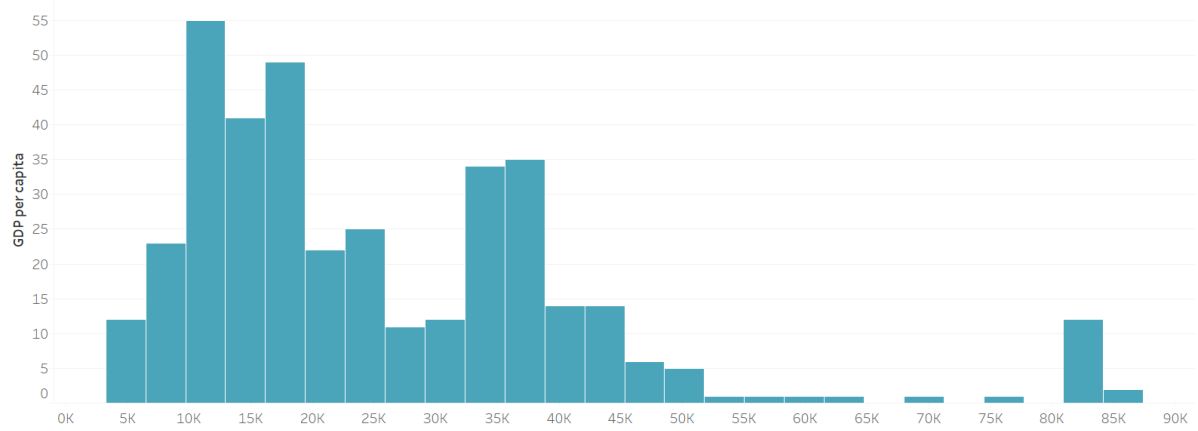
Appendix 5: Histograms of variables departing from normality

As seen in Table 1, a couple of variables depart from the normality assumption of linear regression. Variables with highest skewness values are plotted in a histogram below to visualise their distributions.

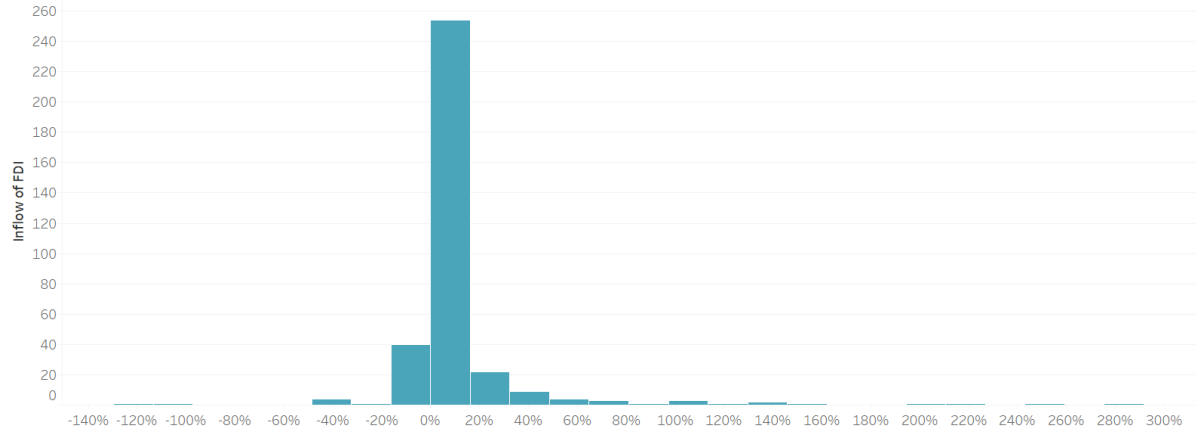
Politicisation is not normally distributed due to punctuated patterns of politicisation, where renewable energy was most salient in 2022. Colours are graded by year, so darker blue indicates more recent. The histogram also enables to see the number of observations clearly per bin.



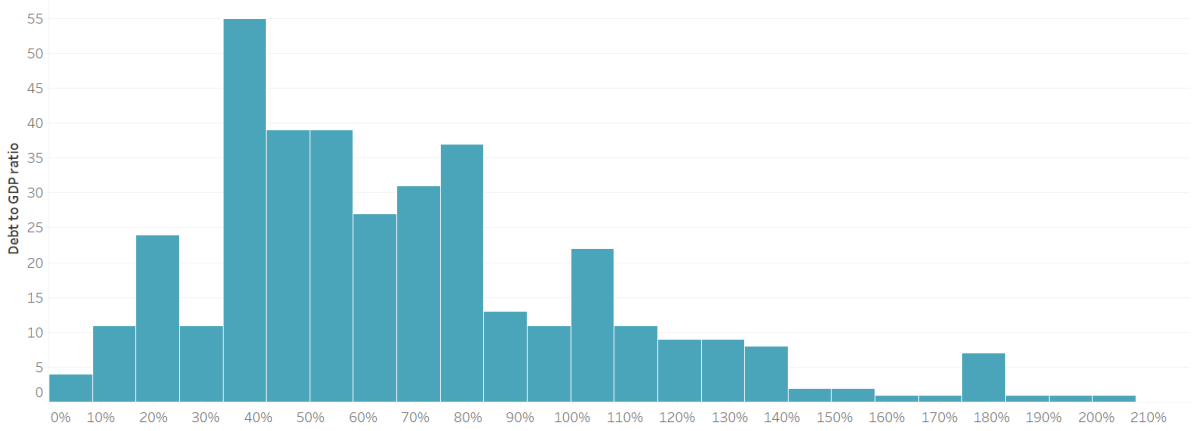
GDP per capita is not normally distributed, indicating there are more lower GDP countries in the EU.



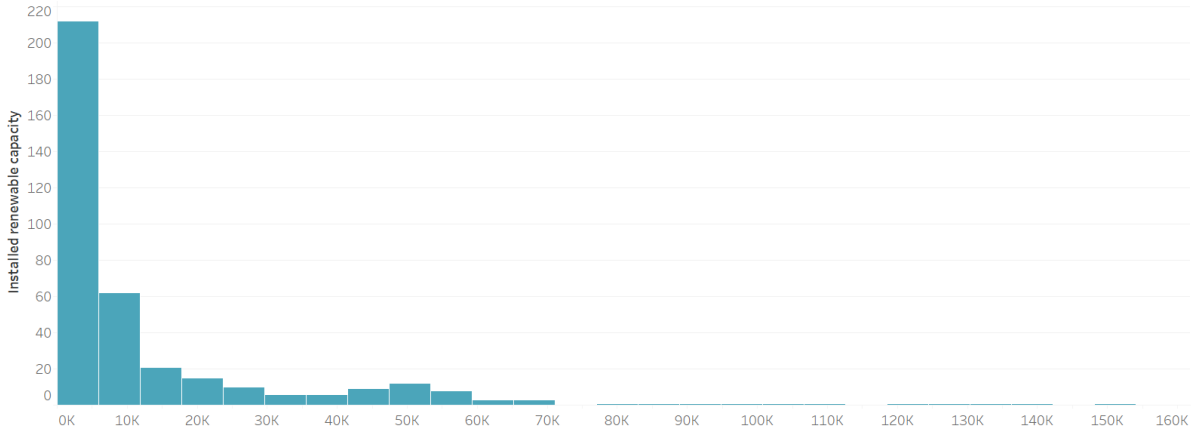
The inflow of FDI is least normally distributed, due to big outliers with Cyprus and Luxembourg primarily. Even without those outliers, the vast majority of countries attract fewer extreme numbers of FDI.



Debt-to-GDP ratios are relatively normally distributed, yet the higher skewness value is shown through the fact that most countries have around a debt-to-GDP ratio between 33% and 83%. Greece and Italy are the largest outliers here to the right end.



Installed renewable energy is the last variable truly departing from normality, which is primarily due to large differences between the 27 Member States in size (of economy and thus) energy demand. Germany is a big outlier here due to pioneering the energy transition or *Energiewende*.



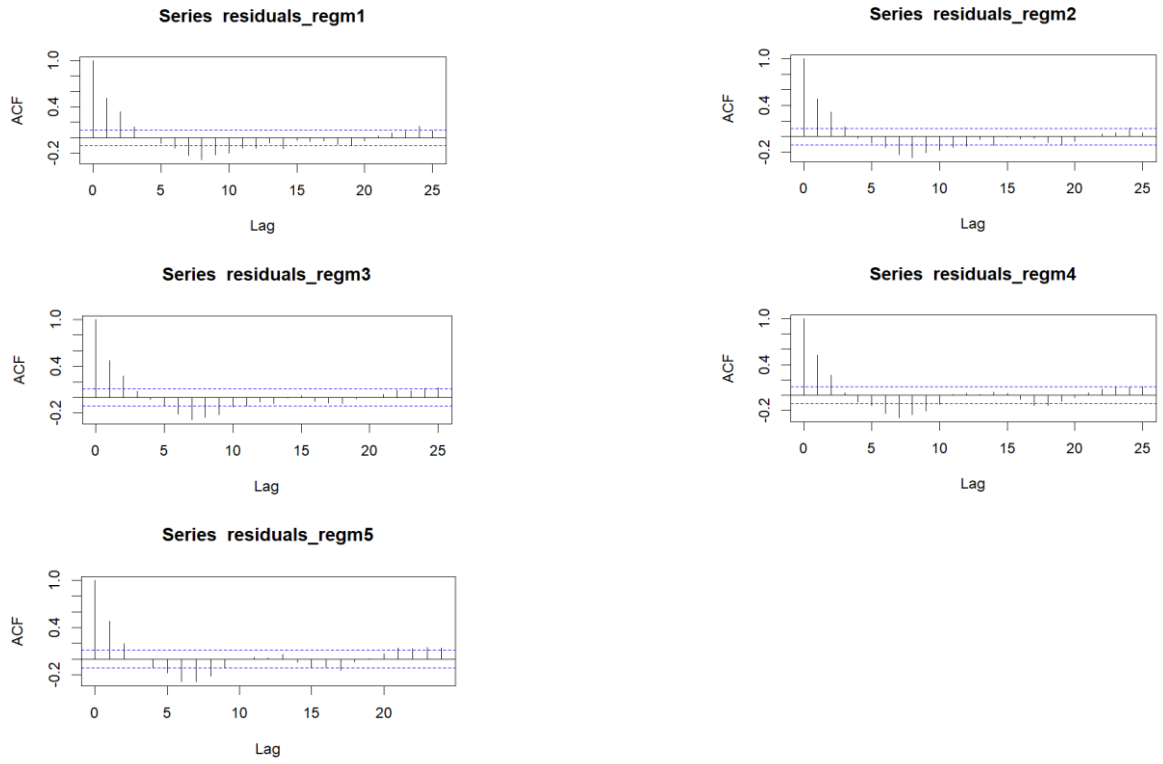
While these variables depart from normal distributions, they mostly show the natural variations across EU Member States. The power of Fixed Effects regression is in the fact that it helps in mitigating this issue of variations, since effects of both individual MS and time periods are taken into account.

Appendix 6: Dealing with autocorrelation

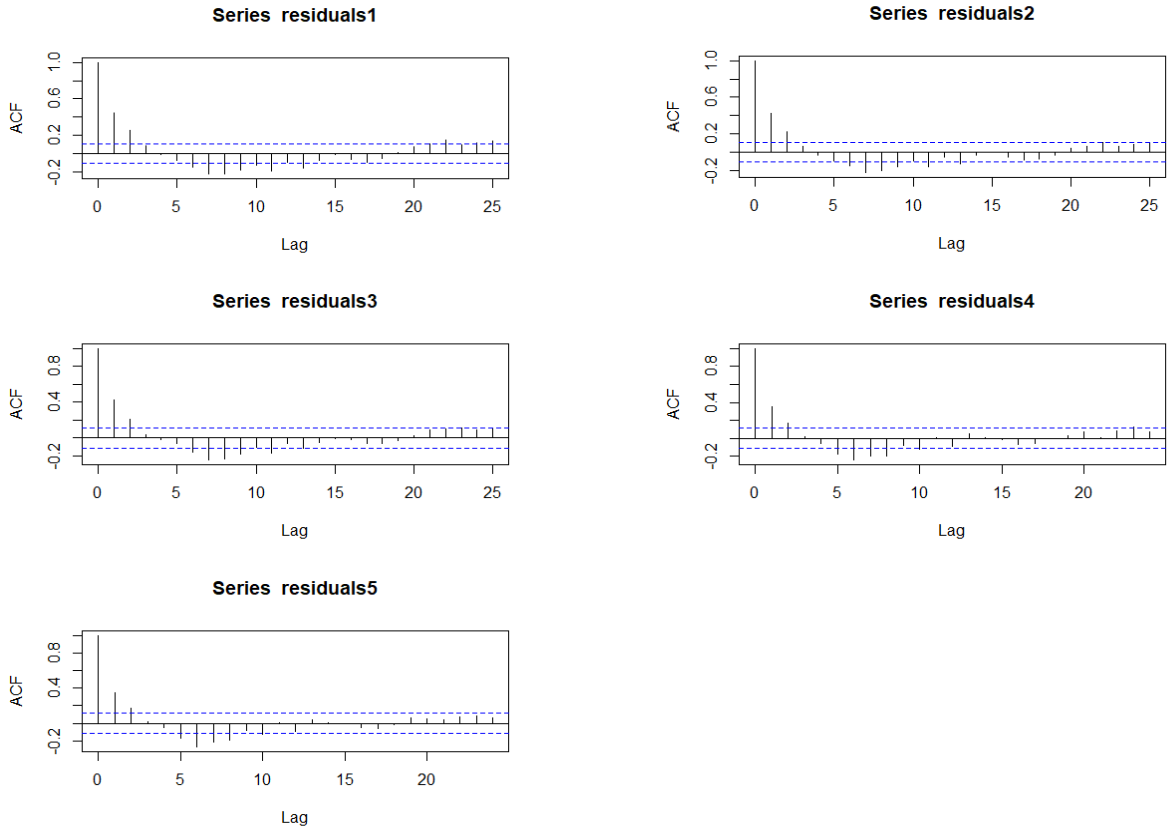
A common problem of Fixed Effects TSCS [Time Series and Cross Sectional] regression methodology is spatial and temporal autocorrelation. This means that the error terms in the regression model, i.e., indications of uncertainty as the difference between observed and expected regression values, are correlated over time and/or across countries. Autocorrelation thus occurs when the current value of the error term is heavily influenced by its past values or the values of neighbouring units. This is a common problem in geographical studies, but comparative politics is often confronted with the same issue. When autocorrelation is present, the assumption of independent error terms is not met which can lead to biased and inefficient coefficients. As such, autocorrelation is a threat to the internal validity of this study and must be dealt with accordingly to ensure reliability and accuracy of the regression results.

In all models, a lagged dependent variable was included as a predictor as this commonly does the job in addressing autocorrelation (see the Beck and Katz standard in Plümper et al., 2005, p. 328-329; Bailey & Katz, 2011). A lag of one year was deemed sufficient, given the results of ACF-plotting through R's *acf* function in the *stats* package. Moreover, lagging the variable even further makes little theoretical sense, as current outcome values would then be predicted using, e.g., values from 2018 if you lag *reshare* by three years. ACF stands for Auto- and Cross- Covariance and -Correlation Function Estimation (RDocumentation, n.d.). As seen below, the ACF values consistently drop to (near-)optimal significance levels indicated by the blue dashed lines. That implies that autocorrelation drops significantly with a one-year lag. Ideally, however, the vertical lines would fall within the ideal significance levels indicated by the blue dashed lines.

The figures below show the ACF-plots for the original models, which still included all WGI as individual variables. These models were thus the models that underwent first heteroscedasticity and autocorrelation tests.



The figures below show the ACF-plots for the final models used in the actual regression analyses, see Table 3. These figures also show that a one-year time lag significantly reduces risk of autocorrelation due to a big drop. Moreover, the ACF-values are also lower than with the original models.



However, given the nature of the panel data, the Breusch-Godfrey test still provides a significant result, indicating that the null hypothesis of no autocorrelation can be rejected. The test did provide lower coefficients with the new models, see the difference below. This implies that autocorrelation is still present after first adjustments, which was later mitigated by using panel-corrected standard errors. However, the nature of the data lends itself to some degree of autocorrelation, which in fact also represents the natural complexity of the phenomena being studied.

Original panel regression models					
Breusch-Godfrey [Autocorrelation]	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Coefficient	301.79	299.57	262.42	267.30	188.19
p-value	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16
Final panel regression models					
Breusch-Godfrey [Autocorrelation]	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Coefficient	145.2	145.19	119.15	131.95	101.06
p-value	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16	< 2.2e-16

Table 10 **Comparison of Breusch-Godfrey tests on autocorrelation between original and final models.**