VARIETIES OF ENERGY TRANSITION: HOW DO INTEREST GROUPS IMPACT THE DECISION-MAKING MECHANISM IN DEMOCRACIES?

by
SINEM TAŞTAN

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Approved by:

Prof. Meltem Müftüler-Baç .....
(Thesis Supervisor)

Assoc. Prof. Dimitris Tsarouhas .....

Asst. Prof. Oya Yeğen .....

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ABSTRACT

VARIETIES OF ENERGY TRANSITION: HOW DO INTEREST GROUPS IMPACT THE DECISION-MAKING MECHANISM IN DEMOCRACIES?

SINEM TAŞTAN

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Thesis Supervisor: Prof. Meltem Müftüler-Baç

Keywords: energy transition, carbon reduction, democracy, veto players, energy companies

This thesis investigates the influence of carbon-intensive energy companies as veto players on the decision-making mechanisms within the energy transition process. The thesis argues that where carbon-intensive energy sectors are consolidated, it is less likely to implement green policies compared to non-consolidated ones due to their increased ability to influence the decision-making process. The first chapter of the thesis provides the historical energy transitions. The chapter highlights the impact and importance of energy as one of the fundamental materials in human life. In this context, the 1973 OPEC crisis is particularly explained because it poses a significant determinant in countries' energy politics. The subsequent chapter compares democracies and non-democracies in terms of their decision-making process and argues that only in democracies, interest groups function as veto players due to the existence of a veto mechanism. This chapter contains Australia and China as case studies and both countries' historical energy trends are examined. The next chapter argues the varieties of energy transition among democratic countries and the relationship between carbon-intensive energy companies and the energy transition is measured. It is observed that there is a positive relationship with fossil fuel production and carbon-intensive energy companies. Subsequently, empirical results are discussed, and selected countries' historical energy policies are shared. In the final chapter, theoretical and empirical results are shared, and further researches are discussed.

ÖZET

ENERJİ DÖNÜŞÜMÜNÜN ÇEŞİTLİLİKLERİ: ÇIKAR GRUPLARI DEMOKRASİLERDE KARAR ALMA MEKANİZMASINI NASIL ETKİLER?

SINEM TAŞTAN

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Anahtar Kelimeler: enerji geçişi, karbon azaltımı, demokrasi, veto oyuncuları, enerji şirketleri

Bu tez, enerji geçiş sürecinde karbon-yoğun enerji şirketlerinin veto oyuncusu olarak karar alma mekanizmaları üzerindeki etkisini araştırmaktadır. Tez, karbon-yoğun enerji sektörlerinin konsolide olduğu durumlarda, bu sektörlerin karar alma sürecini etkileme yetenekleri nedeniyle yeşil politikaların uygulanmasının daha az olası olduğunu öne sürmektedir. Tezin ilk bölümü, tarihsel enerji geçişlerini ele almaktadır. Bu bölüm, enerjinin insan hayatındaki temel materyallerden biri olarak etkisini ve önemini vurgulamaktadır. Bu bağlamda, ülkelerin enerji politikalarında önemli bir dönüm noktası olduğu için 1973 OPEC krizine özel olarak değinilmektedir. Sonraki bölüm, demokratik ve demokratik olmayan ülkelerin karar alma süreçlerini karşılaştırmakta ve sadece demokratik ülkelerde içerdikleri veto mekanizmaları sayesinde çıkar gruplarının veto oyuncusu olarak işlev gördüğünü savunmaktadır. Bu bölümde Avustralya ve Çin vaka olarak ele alınmış ve her iki ülkenin tarihsel enerji eğilimleri incelenmiştir. Bir sonraki bölüm, demokratik ülkelerdeki enerji geçişinin çeşitliliklerini tartışmakta ve karbon-yoğun enerji şirketleri ile enerji geçişi arasındaki ilişki ölçülmektedir. Yüksek karbon emisyonlu enerji şirketlerinin fosil yakıt üretimiyle olumlu bir ilişkiye sahip olduğu gözlemlenmiştir. Ardından empirik sonuçlar tartışılmakta ve seçilmiş ülkelerin tarihsel enerji politikaları ele alınmaktadır. Son bölümde, teorik ve empirik sonuçlar paylaşılmakta ve ileride yapılabilecek araştırma konuları üzerinde durulmaktadır.

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LIST OF ABBREVIATIONS

ACES American Clean Energy and Security Act

ACF Advocacy Coalition Framework

CBAM Carbon Border Adjustment Mechanism

CEEW Centre on Energy, Environment, and Water

CFCs Chlorofluorocarbons

CJEU Court of Justice of the European Union

CO2eq Carbon Dioxide Equivalent

COP Conference of the Parties

EC European Commission

EDF Électricité de France

EGD European Green Deal

EIA Environmental Impact Assessment

ETS Emission Trade System

EU European Union

FDI Foreign Direct Investment

GDP Gross Domestic Product

HI Historical Institutionalism

IDMC Internal Displacement Monitoring Centre

IEA International Energy Agency

IEA International Environmental Agreement

IO International Organization

IPCC Intergovernmental Panel on Climate Change

IR International Relations

IRENA International Renewable Energy Agency

LNG Liquefied Natural Gas

MENA Middle East and North Africa

MMT Million Metric Tons

MSF Multiple Streams Framework

MT Million Tons

NDC Nationally Determined Contribution

NECP National Energy and Climate Plan

NGEU Next Generation EU

NGO Nongovernmental Organization

NRE Non-renewable Energy

OPEC Organization of Petroleum Exporting Countries

PET Punctuated Equilibrium Theory

PR Proportional Representation

R&D Research and Development

RE Renewable Energy

RRF Recovery and Resilience Facility

SDG Sustainable Development Goal

SIDS Small Island Developing States

UK United Kingdom

UN United Nations

UNCED United Nations Conference on Environment and Development

UNDP United Nations Development Program

UNEO United Nations Environment Program

UNEP United Nations Environment Programme

UNFCCC United Nations Framework Convention on Climate Change

US United States

USSR Union of the Soviet Socialist Republics

WEF World Economic Forum

WMO World Meteorological Organization

1. INTRODUCTION

> *"Today we face the very real danger that the hard-won global gains in combating climate change will experience a grievous setback. Developing countries would be left most vulnerable, even though they are least responsible for global warming. But make no mistake: all countries will suffer. Climate change cares little for the borders drawn by man."*
> — Kofi Annan, *Former UN Secretary-General, 2001*

In April 2019, Indonesian President Joko Widodo proposed to relocate Jakarta, the capital city of the country, to Nusantara which is located on East Kalimantan Island due to natural disasters, water threats, and natural resource scarcity (Perwira et al. 2024). By relocating the capital, the government aims to create a safer and more sustainable city. Indonesia is one of the vulnerable countries to climate change-related effects such as extreme weather problems, droughts, rising sea levels, and rapidly increased temperatures. The impacts of these events are expected to impact a wide range of sectors and areas, potentially with costs ranging from 2.5% to 7% of the country's GDP (World Bank 2021). Climate change and the energy crisis pose significant challenges in terms of economic hardships, resource scarcity, loss of species and cultures, natural disasters, displacement, and poverty. Every day without action makes tackling the problem harder and with more complex aspects coming to the surface.

Climate experts have noted that each decade since the 1980s has been warmer than the previous one, and the last decade, 2011-2020 turned out to be the warmest on record. Every year, environmental factors cause approximately 13 million people to lose their lives. In the past decade, weather-related events displaced around 23.1 million people each year, and made many more vulnerable (United Nations 2024). 8.7 million people were internally displaced as a result of disasters by the end of 2022. While not all disaster displacements are caused by climate change, a significant number of displacements occurred due to climate crises (Internal Displacement

Monitoring Center 2024). By 2050, the estimated annual cost of destruction caused by climate change will range from $1.7 trillion to $3.1 trillion globally (Bennett 2023). Without overarching solutions and global responses, it seems certain that the number of lives affected by climate change and environmental crises will continue to rise.

The main proposed solution for tackling these challenges is to reduce carbon emissions, particularly in the energy sector. However, the role and importance of energy in modern human life make this transformation difficult. Energy is vital for the survival of human beings and one of the fundamental materials used to construct our modern societies. Ever since the discovery/invention of fire, it has remained the keystone of modern civilization of humanity and to qualify our lives. Since the beginning of civilization, humans have sought to dominate and utilize energy resources to meet their necessities such as cooking, hunting, warming, shelter, and protecting themselves from external threats. Since then, it has affected our lives in various ways from transportation to heating, industry to technology, and residency. Over time, different usages of energy varied, and energy consumption increased rapidly due to the never-ending technological changes and developments in utilizing energy. The energy consumption has been exponentially increasing since the Industrial Revolution. The dependency on the energy of modern humans has created an asymmetric relation between those who control the energy resources and those who don't. For centuries, the desire to control energy resources has started wars, reshaped borders, and caused brutal conflicts. Because energy is a fundamental material for modern human existence, affordable and clean energy is one of the topics in the Sustainable Development Goals (SDGs) released by the United Nations Development Program (UNDP) in 2015 UNDP (2024*b*). This interconnectedness affects countries more than ever before due to extensive economic interdependence and globalization.

In today's global world, the impacts of any kind of energy-related crisis hit almost all regions and countries, even if they might not be geographically close. For instance, the 2019 COVID-19 pandemic and the Russian invasion of Ukraine in 2022 impacted global energy trends tremendously and illustrated this interdependency, and how the world is interconnected with each other. Historical energy transition has caused rapid and profound social changes like industrialization, production, and consumption patterns, and mass migration from rural to urban areas. The usage of new energy sources such as coal and petroleum facilitated the growth of industries and increased job opportunities (International Labour Organization 2022). This led to mass migration from villages to urban areas, increased population, urban expansion, and the emergence of new jobs. Energy transitions introduced significant automation and mechanization in industrial production, and this enabled more suffi-

cient and large-scale production processes. This impacted the consumption patterns and labor dynamics. The new working class led to significant changes in social class structures. The inequality between workers and owners of capital caused increased social divisions and fostered class conflicts (Britannica 2024*a*). In conclusion, energy transition is a process that cannot be limited to technical transformation; rather it contains long-term consequences and effects.

It should be noted that when it comes to energy, each country adopts its own policies, and although the necessity of cooperation for achieving energy transition is emphasized, countries vary in the paths they pursue. Factors such as domestic dynamics, energy dependency, the types of energy resources a country possesses, and the development of the power of carbon-intense sectors all influence this energy process. In this context, the collaborations and contributions of international institutions and agreements, as highlighted by Keohane and Nye (1973), often remain ineffective. Despite interdependencies in energy, each state progresses in the energy transition according to its own capabilities and constraints. In the subsequent sections, diverging interests will be explored, and the reason why, unlike Keohane and Nye's argument, complex interdependence does not increase international cooperation will be discussed in detail. Cooperation in energy policies between countries depends on various factors, including economic interests, political stability, and technological advancements. However, the key factor is the area in which cooperation is pursued.

When it comes to developing commercial and economic relations, cooperation is more likely to expand both diplomatically and technically. Both energy-exporting and importing countries are motivated to cooperate to develop trade relations, maximize their gains, and avoid energy shortages in energy supply. On the other hand, regarding energy transitions which are shifting systems from non-renewable to renewable energy sources with the aim of reducing carbon emissions and enhancing sustainable systems, countries with carbon-intensive energy sources may be unwilling to cooperate in order to avoid losing their advantages in trade. Therefore, cooperation is less frequently observed in energy transitions.

Additionally, one of the prominent reasons behind the failure of international cooperation is the free-rider problem. A free-rider is an individual who enjoys a benefit without contributing to the costs associated with producing it. The free-rider problem arises because people are motivated to avoid paying for essential collective goods, which makes it hard to provide these goods effectively (Hardin 2003). Collective goods are those where the use by one individual does not affect the availability of the good for the others (Samuelson 1954). Because energy transitions are costly and have long-term effects, the free-rider problem is quite common in these processes.

Since energy is one of the main materials for modern humans and varies according to its dependency level, it is difficult to maintain cooperation. That is why, diverging interests and dependencies prevent countries from cooperating with each other and cause collective action problems (Olson 1971). Collective action problems arise when actors have conflicted interests. When participating in collective actions is expensive, actors are often reluctant to get involved. As long as energy politics remain a country-specific issue, the cooperation that Keohane and Nye (1973) argue for will be absent.

Accordingly, this thesis explores the varieties of energy transitions and investigates the impact of domestic veto players on decision-making processes in democracies in both pluralist and corporatist systems. Additionally, it examines why domestic interest groups cannot function as veto players in non-democratic regimes. The term varieties of energy transition refers to the different paths of energy transition that vary from actor to actor, sector to sector, and according to the degree of dependency. The following challenges with a major research question on why countries with similar dynamics often follow different paths in energy transition, and what are the main factors affecting this process. The study argues that domestic interest groups play a significant role in determining energy politics, and realizing an energy transition also depends on the willingness of these groups. By examining the interactions and negotiations between decision-makers and various interest groups, this thesis explores how carbon-intensive energy companies and their associated interest groups influence decision-making processes. The study highlights the significant role these interest groups play in shaping environmental policies. Interest groups, which include stakeholders from the energy sector, environmentalists, multinational corporations, and business sectors, engage in competition that affects policy outcomes. Their substantial financial resources, lobbying capabilities, and impact on political elections make them a key element in this dynamic.

That is why, this study seeks to enhance the fields of International Relations (IR) and comparative politics by exploring the relationship between domestic and foreign factors. Domestic politics are deeply intertwined with the international system. Additionally, the complex nature of energy politics is influenced by both internal and external factors, which are shaped by political decisions. This interconnection highlights the significance of energy transition as a vital aspect of both IR and comparative politics. The importance of domestic-foreign linkages is emphasized, and examples highlight the extent to which interest groups influence contemporary energy policies. The study also aims to integrate the theory by considering various regime types and both pluralist and corporatist forms of democracy. Additionally, by incorporating data from 23 different countries, the thesis provides an innovative

approach to assessing energy transitions driven by domestic-level political factors. The dynamic nature of energy policies, which is vulnerable to external crises and quickly adapts to technological advancements, can lead to rapid changes in data. Additionally, more explanatory datasets than those used in this study may be available. Considering all these limitations, it is hoped that, despite potential variations in numerical values, the theoretical framework of the study will remain valid.

The thesis is divided into 5 chapters. Chapter 1 presents a brief introduction to energy transition and the research question of the study. Chapter 2 provides a literature review on energy transition and energy-related politics. Chapter 3 highlights the historical evolution of energy transitions, with the main challenges posed by the discovery of new resources over time. Chapter 4 provides an in-depth analysis of the energy transition, compares the similarities and differences between Australia and China within the scope of the process tracing method, and examines the interest groups' diverging impacts on regime types. The theoretical framework of this chapter is based on two-level games. These two countries were selected because, despite similarities in energy sources and development levels, they follow different paths in their energy policies. The subsequent chapter focuses on the varieties of energy transition among democracies by investigating the impact power of carbon-intensive energy companies and path dependence. Empirical results on differentiation in the speed of energy transition are examined through the influence of veto players in the decision-making process. The final chapter contains a general overview of the study, interpretation of results, limitations and how these limitations can be addressed, and finally, recommendations for further research.

2. LITERATURE REVIEW ON ENERGY TRANSITION

The energy transition is not only a requirement for tackling climate change but also necessary for a sustainable energy system, and it means having access to energy resources at affordable prices while enhancing security. In today's world, where fossil fuels are depleting rapidly and threatening sustainable energy supply, it is essential to find new methods and geographies for every stage of the energy process —from production to supply and use—in order to maintain sustainability without facing long-term shortages. In order to ensure sustainability, there should be new ways and new geographies of producing and implementing energy (Bridge et al. 2013). That is why, one of the questions in the energy transition is how new energy will create future geographical developments. There needs to be a redesign of infrastructure, buildings, and transportation systems. The transition will affect local, regional, and global relations, and incapable organizations will be unable to fulfill the requirements imposed by the transition. This process should originate at the local level and be applied regionally and globally like a bottom-up approach (Wahlund and Palm 2022). A comprehensive plan is the only way to tackle fossil fuel dependency (Skocpol 2013). The transition represents changes occurring over time within a specific geographic area, however, this term often overlooks the changes in spatial units and broader economic activities, and spatiality means shaping energy systems and impacting their ability to realize this transformation.

While traditional fossil fuels are limited to specific geographies, renewable energies are not subject to these limitations. This situation raises an important question about which geographies will play a role in transitioning to a low-carbon future. In their studies, Bridge et al. (2013) investigate the spatial organizations of the energy system as being just as crucial as the concept of energy transition in the carbon reduction process. Therefore, they argue that addressing the climate crisis and energy security is fundamentally a geographical project. This process not only requires people to make significant investments in technology, infrastructure, or buildings but also necessitates finding spatial solutions and schemes of governance.

The concept of 'landscape', therefore, plays a significant role because it illustrates the interaction of natural, technical, and cultural elements within a geographical context and how these combinations vary over time and space.

Consequently, the places, landscapes, and territories will create new patterns of uneven development in the energy transition process. Therefore, this energy transition should be understood as a process shaped by geographic factors rather than impacts places. Because different places are interconnected politically, economically, and culturally, the transition will affect these relationships, potentially having both destructive and constructive effects. That is why, one of the challenges in energy transition is managing long-term changes within larger socio-technical systems. The energy transition requires an effective socio-technical system where various components successfully interact with each other. This system should be adaptable to technological innovations, social, political, and economic requirements, and changes both globally and locally (Timmermann and Noboa 2022; Werkheiser and Piso 2015). For a successful energy transition, there should be an appropriate technical and social infrastructure. That is why, the capability is also highly crucial in achieving energy transition. In that sense, energy transition theory highlights the importance of engaging key stakeholders with a shared goal to develop alternative future scenarios to achieve the transition collectively (Meadowcroft 2009). These scenarios could explore various potential futures for carbon-neutral energy supply systems. Collaboration can help overcome challenges and develop capabilities.

Technological development constitutes a significant component in achieving a carbon-zero future and it is crucial in determining the pathways in energy sectors. Promoting renewable energy use, and investing in environmentally friendly technologies help to reduce carbon emissions. The eco-friendlier technologies implemented, the greener growth and sustainable development are achieved, and there is a positive relationship between green growth and technological innovation (Wang et al. 2021). Additionally, they observe that while technological innovations increase, GDP, human capital, and R&D also increase. In this sense, eco-friendly technologies should be implemented to achieve green growth and sustainable development. The transition from non-renewable energy sources to renewable ones is expected to create new opportunities for industries and societies. For instance, according to the International Renewable Energy Agency (IRENA), renewable energy will create 17 million more new employment opportunities than fossil fuels will be lost (World Economic Forum 2024). So far, the pattern of economic development has historically evolved by addressing resource scarcity by exploring new energy reserves rather than improving resource efficiency (Fouquet 2016*a*). However, non-renewable energy sources are limited. That is why, to ensure the continuity of modern civilization and meet the

energy supply, technological investments should be based on resource efficiency. Energy efficiency is crucial not only in terms of economic growth, cost savings, and productivity but also for the sustainability of resources and environmental impacts. Renewable energy sector investments contribute to energy security by reducing the dependence on fossil fuels, particularly in markets where there is an ambiguity about suppliers (Johnstone, Haščič, and Popp 2010). The development of new technologies is not only important for sustaining energy security but also for accelerating the speed of carbon reduction, and for the future environment (Yergin 2006). That is why, renewable energy sources like wind, biomass, or solar will play a significant role in reducing carbon emissions.

Green politics needs investments, funding, and R&D activities to find alternative solutions. In that sense, private investments are especially necessary to enhance sustainable growth and carbon reduction globally. It is essential to increase investments, R&D, funding, and loans in renewable energy to find alternative energy sources to fossil fuels, and to encourage renewable energy usage (Azhgaliyeva, Kapsaplyamova, and Low 2018; Wang et al. 2021). Developing countries should focus on integrating foreign direct investments (FDI) with renewable energy (RE) initiatives with strict environmental regulations in order to generate more renewable energy. This can only be achieved through increasing R&D expenditures and investments together with boosting advanced technologies. On the other hand, the more flexible environmental regulations increase additional FDI, and this leads to higher industrial production which means more carbon emissions. Additionally, the scale effect shows that while economic growth increases, CO2 emissions increase in South Asian countries by depleting natural resources (Mehmood 2022). That is why, policymakers should focus on implementing strict governmental and environmental regulations (e.g. carbon tax) to reduce carbon emissions and achieve green targets while ensuring economic growth (Yergin 2006). However, this might be due to the fact that these selected South Asian countries are more dependent on non-renewable energy than developed countries.

However, another study argues that the fewer the political constraints, the more the government can advance renewable energy policies and boost the share of renewables. Thus, the ability to increase the proportion of renewable energy partly depends on the political institutions and veto players within a state (Bayulgen and Ladewig 2017). Also, the availability of cheap and abundant fossil sources makes economies dependent on fossil fuels which creates vulnerable economies to energy shortages and crises (Fouquet 2016*b*). Eventually, carbon emissions, the economic growth of the country, energy sources that the country depends on, and the effectiveness of the government are aligned with each other over the long term. At this

point, it should be noted that green taxes should not only be viewed as a resource of financing but also a way to transform the behavior of companies and individuals. Additionally, governments should consider including incentives into these taxes in order to motivate people and change their consumption habits (Giddens 2015). Thus, carbon reduction and environmentally friendly practices can be adopted by people.

Fossil fuel-based energy efficiency, increased foreign trade of carbon-intensive energy resources, and higher consumption of carbon-intensive energy products are three factors that affect dependency on carbon-intensive sectors (van Benthem 2015). While technology reduces energy intensity, foreign trade, and overconsumption increase. The outcomes of these two factors suppress technological advancements and create path dependencies which refers to the idea that decisions and outcomes are heavily influenced by past events. Consequently, today's emerging economies seem to be adopting energy-intensive paths, despite advanced technology and its potential to reduce lock-ins. There is a correlation between the lobby groups and system lock-ins according to Fouquet (2016*b*) because they have huge financial resources, they can easily dominate the process and coordinate better to prevent any revisionist movement. The pathway of the energy system shows different levels of development in economic progress due to path dependencies. As a country industrializes and its energy systems change, policymakers should avoid locking the system toward carbon-intensive paths that could harm the system in the long term. Once lock-ins occur, shifting the energy sector and convincing stakeholders toward a sustainable energy transition becomes challenging without facing significant opponents.

At this point, governments start to invest in high-technology projects and subsidy programs to convince energy sectors and their stakeholders in order to eliminate a crisis that threatens their positions in implementing the transformation. Institutional structures and market conditions are determinative in this regard, and the size of the corporation, market conditions, or system lock-ins affect the course of the process. The more flexible the relationship between these components, the faster the transition (Pfeifer, Feijoo, and Duić 2023). On the other hand, if there is an asymmetric relationship between these components, where one dominates the others, the relationship evolves in favor of the dominant one over time, and the possibility of a rapid transition decreases. For instance, major corporations and consolidated industries have more advantages than their counterparts due to their financial capital and lobbying power over decision-making mechanisms in order to protect their interests.

For instance, in countries like France, it is difficult to transform systems to move away from nuclear power and nuclear-based electricity due to the dominance of these

sectors over the others. This situation affects both the decision-making process and the competition among energy choices in the transition phase. In such a scenario, challenging the status quo and transforming it becomes highly difficult for revisionists. Even though alternative energy sources find a chance to perform themselves, if there is a consensus on preserving the existing power dynamics among the decision-makers, they might replicate the previous one (Wahlund and Palm 2022). That is why, Fouquet (2016*b*) indicates the importance of market power in determining the lock-ins, and their influence capacity in phasing out from the existing system. As the size of a company increases, its lobbying power also grows correspondingly. These companies can use their strong financial resources and networks to better coordinate and oppose changes that negatively impact their interests. Consequently, the power of the fossil fuel energy sector significantly influences the degree of lock-in. The transition is not only important in terms of sustaining a green future but also for avoiding becoming over-dependent on a single energy source through diversification.

Energy diversification, therefore, poses a significant factor in enhancing energy security (Bahgat 2006; Deese 1979; Fouquet 2016*b*; Hughes and Lipscy 2013; Li 2005; Niyazbekova et al. 2021; Yergin 2006). However, it should not only be considered as the continuity of energy production but also as sustainability (Timmermann and Noboa 2022). At this point, Li (2005) considers sustainable development to involve the diversification and localization of energy systems. Diversification and localization should be the key point in addressing both current supply crises and the sustainability of energy systems in the future. Relying on a single energy source, no matter how cost-effective and consolidated the system is, can lead to long-term problems, and it would be unsustainable. The energy crises of the 1970s (e.g. 1973 OPEC crisis and, the 1979 Iranian Revolution) showed the significance of energy diversification for energy-imported countries. Especially, if these energy sources are supplied by unreliable suppliers, the risk increases further, and energy diversification becomes more important (Russett 1984). However, in today's world, energy diversification is essential not just for energy-importing countries but for all energy-dependents. This requirement arises from the depletion of fossil fuels and the impacts of the climate crisis. To diversify their resources, and secure their energy systems, countries should look beyond traditional suppliers and energy sources.

Energy security, in this regard, constitutes an important subsection of energy studies, and it is described as a situation where a nation has a sufficient energy supply at affordable prices (Deese 1979). Energy security includes various crucial components, from maintaining an uninterrupted energy supply to factors like migration caused by the climate crisis. Because of the impact it brings, energy transition should be considered through the lens of energy security as well. The future energy mar-

ket will experience both predictable and unpredictable disruptions in energy supply due to climate crisis, and resource scarcity. Firstly, there is a risk of not meeting increased demand due to the growing population, which will also impact market prices. Additionally, wars, international conflicts, and pandemics are examples of external shocks that threaten energy security. Furthermore, climate crisis-related disasters, climate refugees, and technological inabilities are also significant factors when considering the challenges of current energy security. In a world where these threats exist and interdependency is increasing, energy security will heavily rely on how countries manage both their bilateral and multilaterally relationships (Yergin 2006). Energy shortages, asymmetric relations with energy exporter and importer countries, and energy crises, therefore, are the major challenges to ensuring energy security.

Energy security is a global concern that involves increasing interdependence between major producers and consumers. No single actor or country can sustain energy security on its own. Disruptions in energy supply during these external crises increased the focus on energy security and forced nations to seek alternative energy sources to reduce their dependence (Hughes and Lipscy 2013). Relying on a single energy source or system, no matter how efficient it may be at the time, is not sustainable in the long term. Single-source dependence and centralized power generation are highly vulnerable to disruptions, failures, and potential sabotage, leading to significant economic and social consequences and creating energy insecurity and fragility. To address these problems, a mixture of diverse energy sources and systems should be developed to meet the needs of individuals, companies, countries, and regions. Using various energy sources can provide stability and reliability in energy supply. Another important factor in ensuring energy security is localization (Deese 1979; Li 2005). Localizing energy sources and systems will prevent the domination of a single actor over others, thereby, reducing international tensions related to access and control over energy resources.

Energy security cannot be limited to the supply of energy sources from exporter countries to importers at affordable prices, but it can also be a reliable supply of energy to households and citizens. To achieve this, the development of domestic energy sectors should be developed (Niyazbekova et al. 2021). The more developed energy sectors within the country the more quality energy supply to local. Even though the decision-makers implement green policy decisions, these decisions cannot be fully integrated into the system unless they are adopted by societies. This will also reduce the conflict between those who have energy sources and those who do not. Access to renewable energy sources, in this sense, will reduce the division between energy importers and exporters, and decrease the asymmetric relationship

between them (Scholten et al. 2020). The main issue is that while aware of the long-term effects of fossil fuels, the long-term impacts of renewable energy sources are still ambiguous (Niyazbekova et al. 2021). Each energy source affects the environment in different ways, and both have advantages and disadvantages. However, considering the harms of fossil fuels, their depletion, and the continuous advancements in technology, it is possible to address and resolve the problems associated with renewable energy sources.

For instance, projectors show that Bangladesh's fossil fuel resources will be depleted by 2033 (Hughes and Lipscy 2013), and the country is trying to find alternative energy sources to prevent major problems. The over-reliance on a single energy source and centralized energy sources, says Li (2005), makes the system extremely vulnerable to external shocks, disruptions, and failures. Considering the impact of energy on daily life, this failure not only affects the energy infrastructure, but also threatens social, political, and economic systems in general. Therefore, there should be a combination of different energy resources and lock-ins should be prevented to sustain the security. From transportation to industry, heating to housing, most of the systems depend on a sustainable energy supply. Inner and outer conflicts pose a security threat against states' survival and unity and risk the supply of energy sources. That is why, controlling an energy source is significant in terms of protecting themselves from a threat and maintaining the continuity of the system. The geographical location of the country is decisive in conflicts. For instance, when only one of two neighboring countries has oil, and this oil is very close to the border, the probability of conflict is more than three times higher than when neither country has oil (Caselli, Morelli, and Rohner 2015). On the other hand, if energy sources that can be locally or regionally produced and distributed are developed, it will reduce the dependency between countries, and consequently, decrease energy-related conflicts. That is why, sustainability in energy is not limited to the continuity of energy supply but sustainable security.

There needs to be sovereignty to achieve security, and this is highly related to self-determination and non-domination. It is the ability to perform without any prevention from third parties. Energy sovereignty can only be achieved through the accessibility and availability of the products, availability of them, and the production process (Timmermann and Noboa 2022). Sovereignty needs empowerment to increase capacity, and this requires governance and management (Rakshit et al. 2018). This means sovereignty requires the capacity to make decisions independently without interference which is highly related to the term empowerment (Gould 2006). To achieve energy sovereignty there must be a resilient system based on the 4Rs. These are 'resistance', 'redundancy', 'response', and 'recovery' (Panteli and Mancar-

ella 2015). Without these concepts, a country cannot become an energy sovereign. Timmermann & Noboa (2022) add another factor which is providing people with the opportunity to utilize resources. This stage involves people taking part in the decision-making processes, and this requires cooperation among people. However, sovereignty also faces free-riding problems like many stages of energy politics. The less people engage in the process of establishing sovereignty, the weaker the energy system's sovereignty becomes (Szulecki et al. 2016). Empowerment and sovereignty are only achieved through inclusive policies and active participation. Therefore, the terms energy sovereignty, energy democracy, and participatory governance are highly interrelated with each other in energy transition literature.

The concept of energy democracy has gained prominence in recent studies as a means to achieve a just and comprehensive transition. Democracy is a highly crucial government form that allows interest groups (e.g. corporations, and unions) to represent their opinions (Keohane 2015). Energy democracy has three fundamental goals: resisting the use of fossil fuels, increasing social power in the energy sector, and ensuring inclusivity and sustainability within this sector (Burke and Stephens 2017). To achieve this, a more decentralized and democratic system should be implemented. The goal is to transform consumers from being passive participants in this process into having more dynamic and active roles in both the production and consumption of energy. Decentralization is a crucial concept for energy democracy because it assigns more responsibility to local governments and citizens.

At this point, it is important to distinguish between two concepts in the literature: Energy democracy and energy citizenship. While energy democracy concerns who controls energy production and consumption and how energy governance can be more democratic, energy citizenship focuses on how citizens can play a role in participatory governance and refers to the idea that citizens should play more role in the energy transition process. While the literature on energy citizenship highlights individual aspects of this process and focuses on the active participation of citizens, the energy democracy literature tends to concentrate more on collective or institutional forms of involvement (Wahlund and Palm 2022). Energy democracy aims to enable citizens to become stakeholders in the energy sector and influence the decision-making process (Szulecki et al. 2016). Energy citizenship aims to increase the demand for clean energy by involving citizens in the process and putting political pressure on politicians to create new policies in energy politics (Wuebben, Romero-Luis, and Gertrudix 2020). In that sense, energy citizenship is a more narrowly defined concept. However, the goal of both concepts is similar which is the resist the dominance of fossil fuels, control the energy at the local level, contribute active participation, and restructure the energy-related sectors more democratic and

sustainable (Timmermann and Noboa 2022). Both energy democracy and energy citizenship can be achieved through the localization of energy sources. At this point, increasing localization in the energy sector will positively impact citizens' participation in all stages of energy politics Thombs (2019).

In order to originate green energy policies there should be a mobilization of supporters. In their essential study, Cheon and Urpelainen (2013) found that green policy supporters become influential where there is no opposition group. On the other hand, fossil fuels supporters become stronger where there is already a powerful opposition group/green supporter. Thus, carbon sector supporters mobilize themselves according to the strength of environmental supporters. In the absence of a policy demand for a greener future, there is no need to mobilize to preserve the status quo. Fossil fuel supporters' influence is maximized only if there is a consolidated green movement within politics, whereas environmental politics work efficiently if there is no opposing group. This situation can be interpreted as fossil fuel supporters are more successful in influencing decisions and preventing their implementation. When the environmental demands increase over time, carbon-intensive sectors and lobby groups mobilize against these demands more easily than those who support environmental policies. In order to overcome this problem, different interest groups must unite and work together towards the same goal.

Comparative political institutionalism points out the importance of political forms in determining the pathways in the energy transition. For instance, countries with proportional representation (PR) electoral systems tend to implement environmental policies compared to majoritarian systems because majoritarian systems pressure politicians to concentrate on the interest of small groups of swing voters in competitive districts. On the other hand, PR systems motivate parties to engage with a wider range of voters by promoting public goods (Lizzeri and Persico 2001). Also, PR systems tend to have smaller parties in the legislative bodies (Lijphart 1990), leading them to coalition governments (Bawn and Rosenbluth 2003). This situation allows environmentalist parties to represent themselves and function as veto players more than majoritarian systems. In contrast to PR systems, in majoritarian systems due to the structure of the system, environmental concerns are often left to NGOs, and civil societal organizations (Lockwood et al. 2017). Consequently, in PR systems, environmental policies are more likely to be implemented due to the presence of more environmentalist veto players. However, a significant study by Harrison and Sundstrom (2007) points out that it is crucial to consider not just the number and position of veto players, but also what issues are more significant to them. When power is concentrated in the hands of a leader with few or no institutional veto players, there is a potential for both positive and negative decisions due

to the motivations or lobbying.

In societies with weak states, policy formation follows a pluralistic government model where social forces are well-organized and influential (Gourevitch 1978). Public institutions are fragmented, and power is distributed among numerous interdependent but autonomous agencies. These kinds of states are often influenced by various private interests, which can function as veto power or even dominate in some specific policy areas. Consequently, policy outcomes result from the conflict among these complex public-private interactions. The US is a prominent example of this model, where the separation of powers enhances the influence of lobbying groups. On the other hand, France is a strong state model, where the government plays a more active role in managing supply, imports, pricing, and other types of policy. Therefore, in weak states, veto players are more likely to have a constraint on decision-makers.

Energy policy can also be understood through Wallerstein's (2011) core-periphery framework. For example, core countries possess advanced technology, capital, and military superiority in energy production and trade while peripheral countries play a smaller role in these processes and are often limited to supplying raw materials or engaging in lower-value production stages. In the energy sector, core countries lead energy markets and technologies, while peripheral countries have a constrained role within this structure. Peripheral countries are unable to independently manage their energy resources and infrastructure according to their internal needs. Instead, their energy needs and policies are directed by the conditions implied by core countries. This creates limitations in the energy policies of developing countries and leads to an unequal distribution in growth. Consequently, these different levels of development lead to deeper inequalities between countries and create another asymmetric relationship between developed and developing countries. While wealthy countries are capable of implementing effective solutions for the transition, poorer countries may not be, leading to an uneven global transformation. This situation will impact inequalities, conflicts, and negative outcomes between countries. Democratizing energy, in that sense, also means reducing the conflict between energy-rich and energy-poor countries. Energy democracy aims to mitigate the conflict between energy-rich and energy-poor countries. In this context, Lennon (2017) links energy production with slavery and argues that renewable energy has transformed this traditional understanding with the democratization the energy access, and promoting inclusivity in energy politics.

However, the energy transition has its own challenges. For instance, York and Bell (2019) touch upon an important point and argue that from biomass to coal to petroleum there are energy additions rather than transitions because these sources

continue to be used and grow together with the new ones. That is why, there is no replacement but the expansion and diversification of energy sources. However, for an energy transition, there must be a replacement of an energy source by another one. They accept the reduction in coal as a "recency bias" and suggest focusing on long-term patterns, and they observe that there is no actual move away from one energy source. Thus, they suggest that we should be skeptical and not have a false impression regarding carbon reduction. Another significant point they address is that not only the usage of biomass has increased since the domination of fossil fuels but the use of biomass as a material has also increased due to the advancements in fossil fuel-powered machinery. Therefore, the development of an energy source positively impacts the development of other energy sources. New energy sources contribute to the growth of existing ones in various areas, leading to an overall increase in energy production and consumption. They point out that countries and industries within them are not aiming to reduce carbon emissions, rather they try to expand energy alternatives for sustaining energy supply. That is why, promoting renewable energy is not enough to realize a transition towards renewables. In order to achieve this, fossil fuels should be restricted. Otherwise, it will only the expansion and diversification of energy sources.

Another criticism comes from Smil (2016), who argues that even if we were able to adopt non-carbon energy sources at the fastest possible rate, we would still fall significantly short of eliminating fossil fuel combustion by the middle of the 21st century. Another difficulty lies in replacing the fossil fuels used in producing primary iron, cement, and plastics. There are no large-scale alternatives to replace these materials, and none of the proposed methods for producing cement with significantly lower carbon inputs are currently in commercial use. Additionally, Smil notes that building new renewable energy facilities heavily relies on carbon-intensive materials like steel, cement, and plastics. Even if alternatives become more accessible, one must recognize the fact that the existing global energy, which is based on fossil fuels, cannot be easily or quickly replaced by renewables. Both studies have valid points, however, one thing that is certain about the energy transition is that it will occur in the long term and there will be ups and downs in its realization. For instance, it took two centuries for coal to replace wood and become the dominant energy source. Moreover, it should be noted that challenging a status quo is usually difficult when established energy sectors are in place. Another significant point is to differentiate energy usage between developed and developing countries. Given the historical context of energy source usage, it is challenging for all countries to phase out coal or transform their system to renewable energy without reaching a certain level of development. Until that point, none of the countries will be willing

to abandon its domestic energy resources.

Regime complex is another concept for the energy transition, and it was introduced by Keohane and Victor (2011). This term describes a complex relationship where various actors, rules, and regimes interact with each other. It is a system where various actors, rules, and regimes interact with each other, and in the context of energy transition, it is created by the combination of diverse energy sources, policies, and international regulations, and this includes international agreements, energy trade, and technology transfer. In the context of energy transition, a regime complex occurs from the combination of various energy sources, policies, and international regulations. This complexity creates multilayered interactions among different countries' energy policies, international energy agreements, energy trade, technology transfers, and related issues. According to them, energy transition is not only shaped by countries themselves and their domestic politics but also by international interactions and policies. For instance, a country's energy policy can be influenced not just by its internal dynamics but also by international energy markets, policies of other nations, and IOs (e.g. UN, IEA). This situation creates complexity in realizing energy transitions, managing the process, addressing the conflicts caused by energy sources, and ensuring global energy security.

Therefore, energy transition processes should take into account the complexity of the regime while implementing green policies. The international institutions that manage the climate crisis are varied. They have been established at different times by different groups and most importantly, they have developed diverged interests. These institutions are neither integrated nor comprehensive, and they lack a clear hierarchical structure. Instead, they constitute a regime complex in a decentralized system rather than a unified international regime. These different regimes develop various forms of governance (e.g. UNFCCC, bilateral and multilateral initiatives, or nuclear technology) in response to the climate crisis (Abbott 2012). Regime complexes have certain advantages such as they tend to be more flexible and adaptable, and while one group of countries take effective actions, this can encourage other countries to improve themselves. Consequently, it prevents free-rider problems which is crucial to tackling the climate crisis (Keohane and Victor 2011). Although monopoly structures have disadvantages, a regime complex can also suffer from fragmented structure. Its components may have different interests, or the lack of authority can create critical veto points. However, in the absence of a unified international regime, countries should focus on taking advantage of the flexibility and adaptability provided by a regime complex (Keohane and Victor 2013).

Lastly, in today's world, the complexity and deepening of relationships between

states increase their mutual dependency. The rise of globalization and the increasing interdependence between global states make the advantages gained from military actions questionable while more effective methods for extending influence internationally are available (Česnakas 2010). This interdependence constrains the actions of governments and affects their internal dynamics. With the development of international, transnational, and multinational actors in the global system, the dominance of states in the decision-making process has decreased, and its influence has begun to be shared with other actors in the system. Additionally, areas such as technology, trade, economy, communication, and culture have increased their impact power in state relations, while increasing their role in the international system, and this has diminished the dominance of the military. States have been losing control over some critical areas, particularly in the economic area. This situation is described as a complex interdependence (Keohane and Nye Jr 1973). As military force becomes less central as a policy tool and economic and other types of interdependence increase, the cooperation among states tends to grow. This regime model examines energy crises and energy security issues through the lens of international regimes, where specific values, norms, and interdependencies influence the behavior of the actors. In this framework, the most influential actor in the regime offers public goods and benefits to the others within the regime (Özdamar 2010). Thus, interactions between states extend beyond political leaders and hard power. Various actors and branches involve the decision-making process which increases interdependence among states and forces them to cooperate rather than conflict.

All in all, in the literature, energy has been studied through various concepts including sovereignty, security, economy, democracy, and dependency. Among these studies, those focusing on inter-state relations have concentrated on the increasing role of energy in the last century and emphasized growing dependency. Studies focusing on energy security relate the topic to concepts such as energy supply, localization, and diversification. Research on energy transition, on the other hand, focuses on countries' historical energy policies and the steps that need to be taken. Studies on the relationship between energy, development, and economy mostly concentrate on case studies and examine the effects of adopted policies. This study, however, emphasizes domestic-foreign relations and investigates the impact of interest groups on decision-making processes. The aim of this study is to explore the influence of interest groups in decision-making processes related to energy policies. Since the involvement of interest groups in the policy-making process varies from regime to regime, the first chapter compares democracies and non-democracies. The subsequent chapter investigates the energy transition-interest group relationship using data from 23 democratic countries. In light of the findings, the relationship between

energy transition, domestic interest groups, and regime types is discussed. The next chapter addresses decision-making processes in democracies and non-democracies.

3. ENERGY TRANSITIONS, CHALLENGES, PROSPECTS

The first known energy revolution was realized when human groups discovered fire in the Stone Age in 10.000-2000 BCE. The discovery of fire triggered a domination that lasted over generations. Firstly, the control of fire enhanced security, it protected from external threats, competitor groups, and wild animals, and ensured safety even at nighttime. It ensured the warmth and helped them to develop new tools for hunting. The more they engaged in fire the more advanced survival techniques they got. They learned how to cook their food, and this prevented the occurrence of bacterial diseases caused by raw meat. All these developments were tremendously important for the history of civilization. Throughout the centuries, humanity has met its energy needs and basic requirements using the resources provided by nature. Waterpower has been an essential source for agricultural activities over a long time, Similarly to water power, wind energy was utilized for mechanical activities such as grinding and pumping water. Additionally, for many years, wood provided energy demands, particularly for heating and cooking, until coal replaced it.

The first major energy transition occurred in the mid-18th century and early 19th century due to the Industrial Revolution. Biomass was replaced by coal, steam engines, and sophisticated mechanical technology. The mechanization of production stimulated the application of alternative techniques (e.g. hydraulics or steam power) to increase efficiency in fabrics. Thus, not only are fabrics and facilities affected by these shifts in energy usage but almost every aspect of society is impacted by these developments. It dominated industries like transportation, mining, manufacturing, and shaped where people lived, worked, produced and sold (Rafferty 2017). Thus, the dependency and link between modern societies and energy usage increased rapidly. The more people interacted with energy, the more technological innovations were adopted, and new markets were found. Especially, the application of steam power boosted efficiency and made it easier for the production process, market conditions, and specialization. The population growth increased rapidly due to these developments and improvements in life standards —almost in every Euro-

pean country. The new energy forms transformed the relationship between societies and shaped the priorities of modern humans. Asymmetric relationships between industrialized societies and energy, manufacturing processes, and social, political, and economic shifts created a social complexity (Britannica 2024*a*). Between the 1500s and 1600s, wood as a main energy source became insufficient due to wood scarcity, the inability to meet the rising demand of a growing population, and the consequent increase in prices. The transition from wood to coal was first driven by Britain in commerce, urbanization, and technological shifts prompted by the discovery of major fossil fuel reserves. Throughout this shift, commerce, and particularly wage labor required for processing energy sources turned out to be essential in determining the main energy material. The advanced technology in coal-powered steam engines provided its dominance over alternative energy sources during the Industrial Revolution and coal became widespread in various sectors like manufacturing, construction, and transportation in the mid-19th century.

At the beginning of the 20th century, another energy transition was realized from coal to petroleum. The exploration of petroleum-based internal combustion engines broke the dominance of coal as an energy source and in its role in powering steam engines in sectors like transportation, manufacturing, energy production, chemistry, and agriculture. The replacement of coal by oil and gas turned out to be one of the prominent developments of the 20th century —economically, socially, and politically. Petroleum acquired supremacy over coal for several reasons. First of all, petroleum is a much cleaner energy source in terms of air quality. Its emissions, pollutants, and ashes are lower compared to coal. It burns faster than coal, and its efficiency is higher than coal. It is easier to transport and can be used in various sectors. Rudolf Diesel invented the diesel engine in the 19th century when it comes to the 1930s, it ended the dominance of steam engines due to the higher efficiency and low cost. As a result, steam locomotives were replaced by diesel locomotives.

At the beginning of the 20th century, Henry Ford and Alfred Sloan revolutionized the automotive industry with a shift from craft production to mass production which allowed significant profit and rapid production in favor of the United States (US) (Solomon and Krishna 2011). Around the same time, Britain, as in the previous transition, played a pioneering role in the replacement of coal, and just before World War I, First Lord of the Admiralty Winston Churchill shifted the source of the British navy from coal to oil to take advantage against the German navy. Petrol allowed ships to improve twice the distance compared to coal. Furthermore, the storage of oil was easier because it could be stored in tanks anywhere. This facilitated the design of ships and decreased personnel requirements. Efficiency and improvements in speed were the main determinants of this decision. It should be noted that this

decision and dependency on oil increased the importance of the Middle East and North Africa (MENA) region which possesses significant resources of oil. Thus, by the mid-20th century, coal was widely replaced by petroleum. In 1964, oil became the largest energy source in the world (Gross 2020).

The advantages of petroleum compared to coal have triggered the competition among powers over decades. The result was directly and indirectly fed into the eruption of two World Wars, rising terrorism, and civil wars, as well as transforming into a functional tool in the hands of authoritarian governments. For instance, Russia is one of the most prominent countries when it comes to instrumentalizing energy resources. In 2004, the disagreement over gas prices and the ownership of Beltransgaz, the Belarusian transit network, caused a diplomatic crisis between Russia and Belarus. In the first place, Gazprom, a Russian-based petroleum company, increased prices, then, Russia completely cut the gas supply to Belarus. Similar disputes occurred in 2007 and 2010. The 2007 oil dispute between Russia and Belarus resulted in transit interruptions. In 2010, there was a threat of transit cuts due to Belarus' debts owed to Gazprom (Yafimava 2010). Another example is the gas dispute between Russia and Ukraine since the 1990s. The conflict between Ukrainian gas company Naftohaz Ukrayiny and Russian gas company Gazprom resulted in gas supply cuts in 2006. Although Russia claimed economic reasons as the main prompting reason for these cuts, Ukraine perceives these decisions and politics as highly politicized and driven by ulterior motives. Also, European officials interpreted this move as Russia using natural gas as a political tool to blackmail a neighboring country. At the same time, Russia's reliability as an energy supplier for Europe began to be questioned (Bahgat 2006). Even though they eventually reached a resolution in 2008, Russia cut off Ukraine's gas supply in 2009 addressing transit and pricing problems, and unpaid debts. As a result of this issue, numerous European countries and Ukraine were affected between 2006 and 2009. In 2014, President of Russia Vladimir Putin wrote an open letter to Europe and said there would be another gas shortage if Ukraine did not pay its debt of around 2 million dollars and subsequently, in the same year Gazprom cut off its gas supply to Ukraine. Ukraine stated that these gas cuts were political and related to the annexation of Crimea (Lebovitz 2014).

Lastly, in 2022 another dispute occurred between Russia and European countries because of the sanctions imposed by the Western countries due to the Russian invasion of Ukraine in February 2022. Before the invasion, Russia supplied over 40% of Europe's imported natural gas as the largest supplier to meet European energy needs. Germany was the largest gas customer by volume, and some EU countries such as Austria, Bulgaria, and Latvia were dependent on Russian gas for over 80%

of their gas supply. Russia was also the largest supplier for Germany providing almost one-third of the country's oil, half of its coal imports, and more than 50% of its gas (Gross and Stelzenmüller 2024). In response to sanctions against Russia, the country cut its gas supply to EU countries and warned to end supply totally (European Council n.d.). These examples illustrate how Russia instrumentalizes its energy sources as a foreign policy tool. It should be noted that policy changes aimed at reducing energy dependency, similar to those initiated in the 1970s, have been seen in the EU since 2022 following Russia's invasion of Ukraine. From 2021 to 2023, the EU's dependency on Russian gas fell from 45% to 15% (EC 2024). In addition, in May 2022, the EU launched the REPowerEU plan in response to Russia's invasion of Ukraine and to end over-dependence on Russian gas. According to the plan, the Union aims to be completely independent of Russian fossil fuels before 2030 (EC 2022*b*). This invasion was a turning point for the EU, prompting policy changes aimed at both fulfilling commitments to green transition, and achieving energy diversification and security. Additionally, the IEA (n.d.*h*) considers the current energy crisis to be a much more global crisis compared to the one in the 1970s, due to its broader impact on various fossil fuels, whereas the 1970s crises were primarily limited to oil. Furthermore, the global economy is more interconnected now than it was in the 1970s.

Even though the dominance of petroleum has not been lost, the 1970s was a breakdown both for the future of energy and energy prices. On October 6, 1973, the fourth Arab Israeli war occurred between Israel, Egypt, and Syria on the holy day of the Jewish people. That is why this war is widely known as Yom Kippur War. During the war, Arab members of the Organization of Petroleum Exporting Countries (OPEC) adopted a new tool for their campaign against Israel and imposed an embargo and increased oil prices against Western Countries (e.g. the US, Netherlands, Portugal, South Africa) to curb their support to Israel. The sharp decline in the oil supply led to petroleum shortages as well as increased oil prices which hit Western countries who relied on OPEC for their energy supply. The OPEC embargo lasted until 1974 for almost five months —leading to a major global energy crisis, illustrating the energy dependency of the Western, industrialized countries on the Middle East. A barrel of oil increased from $2.90 to $11.65 in January 1974 (Corbett 2013). The impact of oil prices hit the US even more due to a sustained increase in energy demand since the 1970s. Even though the 1973 OPEC crisis had a significant effect on determining energy politics, this was not the first time that OPEC instrumentalized oil export for their political interests. For instance, in 1960, the Arab members of the OPEC had already discussed cutting off supply to states that they considered unfriendly for their political objectives (Solomon and Krishna 2011). In

addition, Saudi Arabia, Kuwait, Iraq, Libya, and Algeria had imposed an embargo against the US, the United Kingdom (UK), and West Germany due to the Six-Day War between Israel, Egypt, Syria, and Jordan in 1967. Another energy crisis in the 1970s was the Iranian Revolution in 1979. Iran was one of the biggest oil exporter countries at that time, however, the inconsistencies in the political sphere and the regime change affected the production. The decline in oil production led the supply constraints and this impacted the global oil market sharply. Until these crises, oil prices were relatively stable, however, the 1973 OPEC crisis led to a sharp increase in global energy prices, and both 1973 and 1979 prompted an inquiry into energy dependency, energy security, and the impact of energy on domestic politics, especially for the Western industrialized countries —including Japan. Multiple countries started to search for alternative energy resources, and they reshaped their system from energy substitution regimes to stable energy shares (Devezas et al. 2008).

However, despite the global impact of the 1970s energy crises, there was a significant variation in different countries. That is because energy dependency varies among countries, resulting in different responses to energy crises. Particularly, the 1973 OPEC crisis led to significant changes in certain countries. Brazil was one of the countries that questioned this over-dependency on external energy resources and started its initiative on biomass to reduce its dependency and diversify its energy resources. During the 1973 OPEC crisis, Brazil was importing 80% of its petroleum (Solomon and Krishna 2011). Therefore, it began to promote bioethanol from biomass sources like sugarcane by providing state subsidies. Ethanol became the major energy resource in Brazil only in decades (Agrawala and Andresen 2001). It was one of the fastest energy transitions due to the availability of conditions (e.g. lack of a consolidated domestic energy market, and strong opposition to realize this transition). The significance of bioethanol is reducing dependence on petroleum by blending it with diesel fuel. Bioethanol and biomass became instrumental in transportation, agriculture, and providing energy for rural areas. According to Lehtonen (2007), the government's emphasis on the ethanol program, the mobilization of stakeholders in realizing this program, and technological innovations were the main objectives in achieving this transition. Brazil adopted its own formulation to reduce its dependency on imported oil, and its negative aftershocks in the Brazilian economy.

An important example from the European continent is Denmark which shifted its energy system due to the 1970s energy crises. After facing financial difficulties due to rising oil prices and concerns about the country's energy security because of major shortages, Denmark began a process of diversification of its energy resources. In 1985, the Danish parliament passed a resolution that prohibited the construction

of nuclear power facilities on Danish territory. That is why, instead of nuclear power, the country investigated wind turbines mostly for agriculture and electricity generation. Denmark aimed to increase its self-sufficiency by diversifying energy sources and giving a primary role to district-level heat and electricity generation (Timmermann and Noboa 2022). Currently, as of 2024, this transition paid off, with wind power constituting 54% of total electricity generation. Additionally, the share of renewable energy sources is 39.7% in general (IEA n.d.*f*). Today, Denmark is the second country after Sweden to achieve renewable targets according to the Energy Transition Index (Statista 2024*b*). The country aims to become a net zero emitter by 2045 and reduce 110% carbon emissions by 2050 (IEA n.d.*f*). In contrast to Denmark, France developed its energy program based on nuclear power. In 1973, more than 70% of France's energy supply was coming from oil and it was mostly imported from the Middle Eastern countries accounting for 71.6% (Taylor, Probert, and Carmo 1998). When the oil embargo hit, France decided to shift its energy program towards nuclear energy. Messmer Plan was initiated by Prime Minister Pierre Messmer in 1974. The plan aimed to generate France's electricity from nuclear power together with diversifying France's energy sources while suffering from the oil crisis. The first power plants were constructed in the same year and currently, France has 56 operable reactors, and all of them are operated by Électricité de France (EDF), a state-owned company. Moreover, the country generates %70 of its electricity from nuclear (World Nuclear Association 2024).

It is worth noting that France was not the only country that shifted its energy intensity from petroleum to nuclear. Nuclear power continued to become widespread. For instance, in the US, the electricity generation from nuclear power was 22.68 thousand MW in 1973, this amount reached 98.16 thousand MW at the end of the 1980s. Currently, there were 54 nuclear power plants in commercial operation, which included a total of 94 nuclear reactors in the US (U.S. Energy Information Administration 2024). China follows the US example in its own nuclear energy consumption. Currently, in China, there are 56 operable reactors and 30 reactors under construction (World Nuclear Association 2024). Indeed, China views nuclear power as a way to move away from coal. The reason for this is that even though nuclear power is not accepted as renewable energy, it is an important transit for reducing carbon emissions. Of course, the destructive effect of nuclear power plants (e.g. Three Mile Island in 1979 in the US, Chernobyl in 1986 in the USSR, and Fukushima in 2011 in Japan), waste, nonproliferation/terrorism, and costs are still significant problems in the usage of nuclear energy (Devezas et al. 2008). However, nuclear energy continues to be a preferred energy source due to reasons like energy efficiency, sustainable energy supply, and low carbon emissions.

The 21st century has been witnessing another energy transition from fossil fuels to renewable energy sources. Increasing environmental disasters show the importance and urgency of taking action against the climate crisis. Even though the environmental protests started in the 1960s' social movements when people demanded civil rights containing anti-war, anti-nuclear, and anti-oppression, and the 1970s and 1980s were characterized by efforts to seek alternatives for oil and establish energy diversification, until the 1990s the need for a transition for environmental reasons was not on the agenda. Since the 1990s, there has been an increased emphasis on addressing the climate crisis and international international efforts have intensified. In this sense, the Montreal Protocol in 1987 was one of the first steps in tackling climate change. The importance of this protocol was that it was ratified by all countries who signed the Protocol. The protocol aimed to protect the stratospheric ozone layer by controlling the production and consumption of substances such as Chlorofluorocarbons (CFCs) (UN Environment n.d.). One year later, at the Toronto Conference titled 'The Changing Atmosphere: Implications for Global Security' in June 1988, the need for the leadership of industrialized countries to reduce carbon emissions due to historical responsibility and the goal for 20% cuts by 2005 was accepted (WMO 1988).

The same year, in 1988, the Intergovernmental Panel on Climate Change (IPCC) was adopted by the United Nations Environment Program (UNEO) and the World Meteorological Organization (WMO) (IPCC 2024). The reason behind it was to generate theoretical, empirical, and academic knowledge on climate change. Another important step was the United Nations Conference on Environment and Development (UNCED), in other words, the Rio Summit held in Rio de Janeiro in 1992 (UN 1992). The main goal was to find a common ground for all stakeholders and to establish a solution for the environmental crisis. Thus, the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992 and entered into force in 1994 to reduce carbon emissions and prevent more pollution (UNFCCC n.d.). Furthermore, parties decided the come together to set standards, analyze the progress, and negotiate further actions. Thus, the Conference of the Parties (COP) was established as a supreme decision-making body of the UNFCCC. The first COP was held in Berlin in 1995 (UNFCCC n.d.). The central issue was the individual commitments of all parties to make progress.

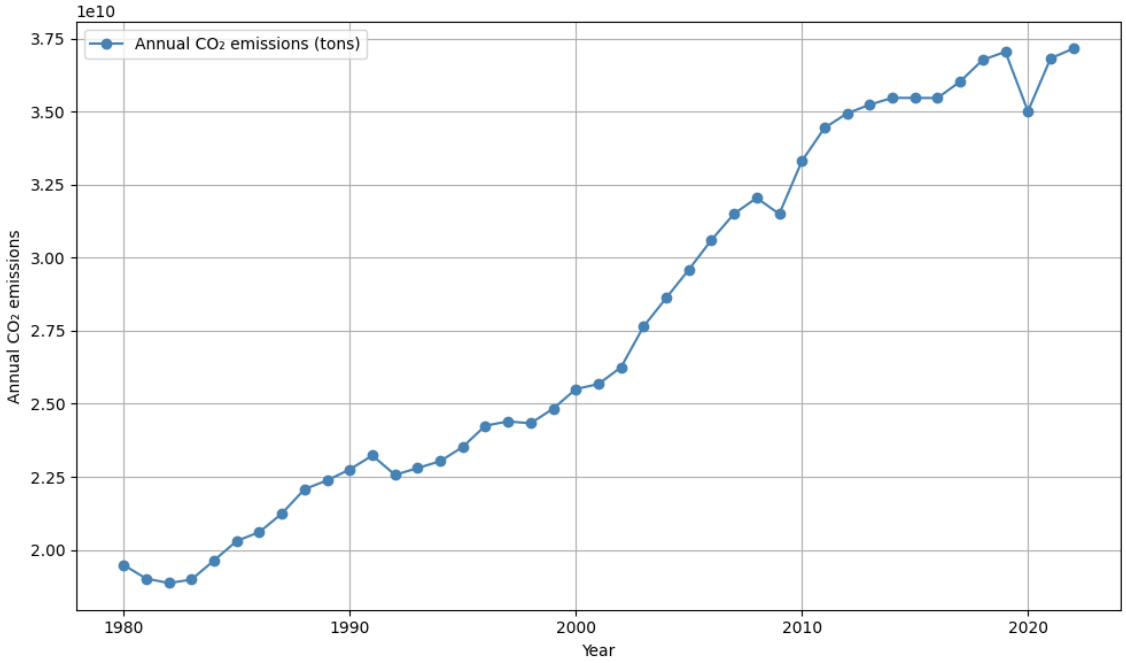
In 1997, the Kyoto Protocol was accepted in order to tackle the climate crisis, and the industrialized countries were accepted to reduce their carbon emission to the levels of the 1990s. The protocol entered into force in 2005. In line with its main premises, for 37 industrialized countries and the European Union (EU), a 5% carbon reduction compared to 1990 levels was set as a target for the period

of 2008-2012. The second phase of the protocol was held in Doha in 2012, and the Doha Amendment was proposed for the period of 2013-2020. According to the Doha Amendment, parties committed to reducing their carbon emissions by at least below 1990 levels during 2013-2020. The amendment was accepted by 147 parties, the threshold was 144, and it entered into force on 31 December 2020 (UNFCCC n.d.). The Paris Agreement was accepted in the COP21 in December 2015 and entered into force in 2016. The main difference between the Kyoto Protocol and the Paris Agreement was the acceptance of the climate crisis as a shared problem (*Global Climate Agreements: Successes and Failures — cfr.org* N.d.). Thus, the agreement was applied to all countries without any distinction of development. Thereby, the agreement is not limited to industrialized ones as in the Kyoto Protocol. The main goal was determined to hold the increase of the global temperature and limit it to 1.5°C below. Additionally, each party determined its Nationally Determined Contributions (NDCs) in order to clarify its roadmap to achieve carbon reduction. Also, the parties agreed to support one another in terms of finance, technology, and capacity-building to realize these goals.

However, when examining annual carbon emissions from 1980 to 2022, it becomes evident that both the Kyoto Protocol and the Paris Agreement have not succeeded in significantly reducing carbon emissions. There was a slight decrease between 1980-1984 due to the Iran-Iraq War, another decrease from 1991 to 1992 due to Iraq's invasion of Kuwait, a decline between 2008 and 2009 because of the global economic crisis, and finally a significant reduction in 2019-2020 due to the COVID-19 pandemic. It is observed that external factors have caused a short-term carbon reduction, however, it appears that international environmental agreements have had no effect. These results on annual variation in carbon reduction can be seen more clearly in Figure 3.1 below.

The reason for the failure to reduce carbon emissions at a global level lies in the lack of international cooperation and the existence of free riders. One of the main reasons for the challenge in international cooperation is that each state has a different energy dependency and energy perception which makes it difficult to convince countries of a common goal (e.g. reducing CO2 emissions and combating climate change) and realize energy transition. Additionally, because of agency issues domestic politics may undertake suboptimal policies than expected. Thus, different backgrounds in terms of institutions, culture, and financial framework can block international cooperation (Fearon 1998). Diverse interests and different pathways among states do not allow for a linear transition. Ensuring self-sufficiency, enhanced security, and improved diversification are some of the main topics as well, and most of the time prioritization of these issues comes before environmental politics. For

Figure 3.1 Annual Variation of CO2 Emissions in the World from 1980 to 2022



instance, in the context of the EU, the foundations of the Union were laid with the aim of subjecting coal and steel to joint control. However, energy integration remained low, compared to other areas (e.g. education, free trade, services, monetary, etc.). The reason is the diverging interests and dependencies on energy resources among the EU countries. One of the main reasons for the failure to fulfill the commitments given in the environmental agreements is also these diverging interests. Accordingly, the lack of collective action (Olson 1971) due to the differentiation in energy dependency and perception prevents all states from acting collectively and creates a malign equilibrium (Keohane 2015). As issues become more complex with all actors becoming net payers, it becomes harder to solve problems without encountering any free-rider problems (Keohane 2015; Keohane and Victor 2013), especially in the absence of a hegemonic leader. However, climate crisis is a global problem that requires global action. Unilateral changes are neither sufficient nor efficient. Besides, no country is willing to take this responsibility unilaterally because of the high costs and disadvantages of competition. That is why, energy is mostly seen as a national concern both because of its security matters and possible consequences in domestic politics in any disruption. Thus, each country should be examined one by one to analyze the underlying reasons behind their energy politics.

In that sense, International Organizations (IOs) or Nongovernmental Organizations (NGOs) are ineffective in convincing states to decide on energy politics due to these

diverging interests. IOs can only facilitate this process through energy diplomacy, public policy, and promoting cooperation and partnership among countries. Additionally, the enforcement power and authority of IOs depend on their members, sovereign states, which means any decision taken by an IO that is not recognized by member states cannot impose binding obligations on those states. For instance, the International Energy Agency (IEA) was established after the 1973 OPEC crisis to provide information, sustain efficiency, and facilitate problems importing countries face. It also functions as a regulatory factor for energy-importer countries in terms of ensuring energy security, sustainability, and accessibility. On the other hand, OPEC was established in 1960 to improve cooperation among petroleum-exporter countries and regulate petroleum prices around the globe. In addition to these energy market regulatory organizations, there are lots of bilateral agreements with third parties that aim to build a better dialogue.

The bilateral dialogue between the EU and OPEC to improve producer-consumer relations in the second half of 2004 is a clear illustration of this goal. Surely, the reason behind this agreement was to sustain energy security through the security of the supply of fossil fuels according to the EU together with ensuring a stable international oil market. However, in terms of addressing environmental-related problems or realizing energy transition, the impact of IOs or NGOs remains low. That is why, the unit of analysis of this research will be state-level analysis (Waltz 2018). This is because it is the states that can and should act on combating climate change, especially the industrialized ones. At the same time, the primary responsibility for tackling climate change should belong to the countries with the highest carbon emissions due to the historical paths and resource accession.

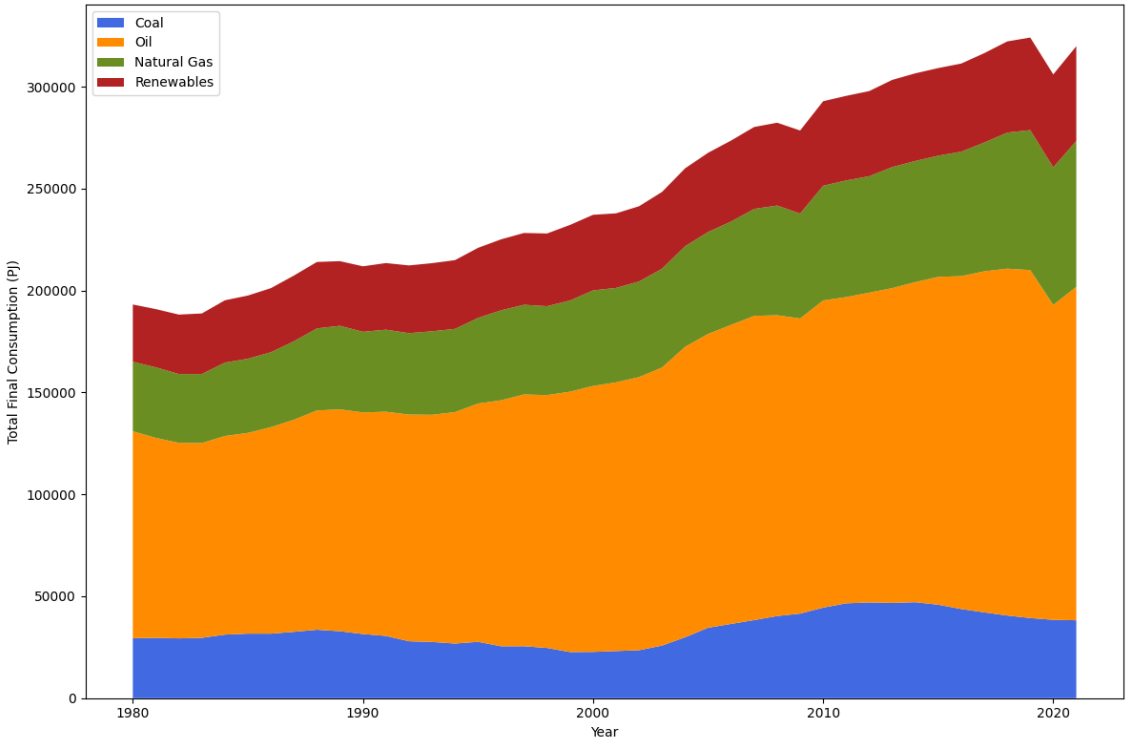
Countries with the highest carbon emissions will primarily focus on renewable energy sources in order to realize energy transition. However, renewable energy has its advantages and disadvantages. One of the advantages of renewables for sure is their eco-friendliness. Carbon-neutral resources and production would minimize the environmental effects. Another advantage is because most of the renewables require localization, the supply of energy at accessible prices is more likely to happen. Thus, it eliminates the disadvantages of fossil fuels in terms of energy security. Also, fossil resources are included in Hardin's Tragedy of the Commons (1968). The overconsumption of these resources over centuries will lead to their depletion. On the other hand, the reproducible nature of renewable energy sources makes them advantageous. Additionally, while reducing energy dependency, it would broaden the scope of action of states in foreign policy. Energy becomes a tool in the hands of energy-exporter countries and depending on relations they can cut supply or increase prices. For instance, according to the World Economic Forum Global Risks

Report (**?**), 41 countries out of 113 identify energy supply shortages as the top five risks that their country faces. Among these Belgium accepts it as the second biggest threat, Bangladesh first; Italy second; Iraq third; Pakistan second; and South Africa first; and the UK third accepts energy supply shortages as a threat to their country. To reduce the dependency on energy and carbon emissions, one should be able to find more efficient ways for energy production. The developments in the energy sector are expected to create new employment opportunities, specifically for local economies. Additionally, there are varied prices of oil due to the quality of crude oil, the destination, taxes, exchange rates, the storage capabilities. That is why sustaining prices is challenging both for producers and consumers (Bahgat 2006). Renewables would eliminate these challenges.

If we consider the disadvantages, first, the transition to renewables requires a mass transformation in almost every aspect of social life. Secondly, implementing this transition is quite costly. Also, most of the renewables are highly dependent on nature and weather conditions, and production level differs according to these situations. Geographical limitations may prevent a country from transforming its energy system into a new one. Storage capabilities, high costs in production, and supply chain constraints are other examples of disadvantages of renewables. Thus, given today's possibilities, the sustainability of renewable energy contains difficulties for both producers and consumers just like in non-renewables. However, these unsustainable conditions can be fixed through technological innovations. Regarding efficiency, it requires technology development and investment which is highly dependent on stakeholders' willingness and state subsidies.

All in all, one must accept that there is no single transition. There are varieties of energy transitions due to specific conditions in different countries, opportunities costs they have, challenges, and outcomes. Pathways and the speed of energy transition also vary. Most importantly, the reasons motivating state actors for the adoption of measures for this transition vary. It might be because of environmental reasons, but also for ensuring diversification, reducing costs, creating sufficient systems, lacking fossil fuels, or ensuring energy security. One thing is certain that this transition will not happen suddenly but rather unevenly. Furthermore, the adaptation of renewables into our lives requires time as well. The process will be the composition of complex policy regulations (e.g. taxation allocation of resources, R&D), financial assistance, and detailed arrangements in every aspect of life. Thus, like other energy transitions, this one will spread over a long period and contains many trials, ups and downs of non-renewables, and adoption of renewables. The sociotechnical transformation and financial shifts necessitate a process rather than a quick change. According to the Centre on Energy, Environment, and Water (CEEW), the finan-

Figure 3.2 Total Energy Consumption by Source from 1990 to 2020



cial cost of finance will be the most challenging part of it (World Economic Forum 2020). Above all, the energy transition is more influenced by socioeconomic shifts that assist in removing barriers to modern fuels' broader use (Leach 1992).

On the other hand, there are some question marks against the existence of this transition. For instance, York and Bell (2019), in their substantial work, criticize the term 'energy transition' and offer 'energy addition' by looking at energy consumption rates. According to them, for an energy transition towards renewables, there must be an abandonment of fossil fuels. However, each year consumption and dependency on fossil fuels have increased rapidly. Thus, this process can only be additions of new energy sources rather than a transition. This fact can be seen in Figure 3.2 above. The representation of energy consumption from 1990 to 2020 shows that there has been an increase in the usage of fossil fuels, especially after 2010 due to population growth, increased demand, developed market conditions, and advanced technology.

While York and Bell present valid points, it is essential to consider that none of these transitions in history were realized suddenly. Energy transitions are long processes that require decades to complete, and the larger the scale of existing uses and transformations, the longer the replacements will take. Rapid transitions, in this sense,

are considered anomalies, and exceptions are typically seen in countries with small populations (Smil 2010). Energy transitions often begin in a small sector or area and then spread to other areas. Large transitions, therefore, are the accumulation of various small transitions. That is why, focusing on the overall transition may underestimate the minor changes that form the basis of these transitions (Sovacool 2016). Coal has been the dominant energy source since the Industrial Revolution and the replacement of it took almost a hundred years. In fact, fossil fuels including natural gas, coal, and oil have crucial impacts on countries' development.

In Germany, for instance, coal played a significant role in development, particularly during the 19th and 20th centuries. Coal production and utilization contributed to coal-fired industries' growth and even today, coal occupies a significant place in Germany's energy consumption. Despite the fact that Germany has successfully reduced coal supply by 35%, coal production by 53% between 2000 and 2022, reduced the share of coal in electricity generation by 36%, and it aims to phase out coal totally by 2030. The country is still number one in Europe in terms of coal supply, electricity generation from it, and import rates as well as the share of coal in emissions. Additionally, Germany derives 100% of its coal consumption from lignite, which is considered the most environmentally harmful type of coal (IEA n.d.*g*). Therefore, energy sources like coal are indispensable for countries' development due to their low cost, accessibility, and advantages.

Currently, China and India are the number one countries in the world in coal consumption. While China and India together consume a total of 5,412 million metric tons (MMT) of coal in 2023, for the rest of the world this value is 2,621 MT (IEA 2022). Fossil fuels have historically played a significant role in the development of countries. It will also depend on the degree of dependency on the existing energy source. While petroleum breaks its dominance in some sectors like transportation, coal maintains its dominance over steelmaking due to its high quality. That is why, the IEA World Energy Outlook (2023*c*) forecasts in its projections that there will be a hybrid regime of both renewables and non-renewables in 2050 scenarios. In fact, there is rapid population growth and energy demand in these countries accounting for this growth. Additionally, it is important to remember that previous transitions were driven by the need to use energy more efficiently. In contrast, current energy transition should be realized for a more crucial reason which is addressing the climate crisis. If this transition does not take place, not only industries but also living spaces and their inhabitants will suffer. This indicated the importance of this transition.

This transition process and its implications will affect each unit (e.g. households,

society, state, and international system) differently. Their vulnerability levels, lock-ins, and alternative paths differ. Thus, the energy transition has different levels of impact on local, regional, national, and international level governance structures. Besides, it is hard to forecast individuals', organizations, societies, and international system's reaction to it. Although climate change is a global problem, the degree of damage differs from country to country. Island countries, low-lying countries, and underdeveloped ones are the most affected countries both because of their geographical locations and lack of financial assistance to cope with the outcomes of the climate crisis.

For instance, most islands are on the frontlines and have been affected by the climate crisis due to the sea-level rise and extreme weather conditions. The climate crisis has become a national security crisis for most of it. The existence of these islands and the culture that they have are in danger and the ecosystem has been damaged. Especially, atolls like the Marshall Islands, Kiribati, Tuvalu, and Maldives are the most threatened ones. Additionally, changes in the sea level may damage the infrastructure of undersea cables, threatening the global connection (Baruah 2023). Small Island Developing States (SIDS) are a group of islands that have similar characteristics, vulnerabilities, and challenges in terms of climate conditions. The inequality among nations and different degrees of development compels Island countries and the Global South to push for responsibility from developed countries due to the history of colonialism. Besides, SIDS are responsible for only 1% of global emissions (UNDP 2024*a*), however, they are the most affected ones in terms of the climate crisis.

Thus, the Global North and developed countries should lead this process for the sake of climate justice. Especially, G20 countries are the ones who should take responsibility and lead the process because of their high rates of carbon emissions. Only if they reduce their carbon emissions, there will be a positive change and a chance for the frontlines. In addition, the world's biggest companies are energy companies that mostly rely on fossil fuels. One of the significant challenges in this aspect is that the lack of effective government and consolidated institutions makes it difficult to tackle the problem and hinders rapid reactions. Public policies are crucial in sustainable transitions. Challenges, long-term development goals, and specific strategies to achieve these targets are outlined in policy programs. Especially, in established systems, sectors and individuals often resist change. At this point, policymakers and other officials face resistance, conflicts, and various obstacles (Markard 2018). That is why, the role of governance and strict environmental regulations are important determinants in the energy transition.

Democracies are generally more willing to pay the adjustment costs when facing external shock because their political survival depends on it. The goal is to convince their electorate by reducing vulnerability to international energy shocks. In order to achieve this goal, good regulatory institutions play a crucial role. Only strong regulatory institutions effectively make long-term adjustments and reduce vulnerability. On the other hand, poor regulatory institutions cannot achieve this long-term reduction in vulnerability to external shocks (Aklin and Urpelainen 2011). New taxation policies on non-renewable energies or state allowances will be an effective mechanism to facilitate this process. At this point, countries that have no strong capabilities to implement new policies will be the most affected ones (Keohane 2015). Governments that have weak environmental regulations would face difficulties in adopting and implementing international decisions.

That is why, the energy transition should be studied in-depth by political scientists due to the consequences it brings in terms of socio-technical transformations, the changing dynamics in the international system, and the requirements for new regulations on energy politics. The complex nature of international power dynamics together with the hardship of compromising or finding a common ground requires additional research in the political science literature in order to address these challenges. The bargaining process and the commitments that countries give should be followed closely. Thus, political scientists are needed for the study of the consequences of the energy transition and to address social, political, and technical problems that occur because of the transition. The implications and regulation processes constitute an important part of the realization of this process.

For instance, according to Keohane (2015), there are four tasks that political scientists should take into consideration while studying climate change and environmental politics; analyzing how to avoid 'paths of least resistance', creative thinking on climate change issues, studying climate change comparatively, and examining how emotions play a role in shaping reactions on climate change in the long term. Additionally, politics shape the decision-making on energy policies and determine the choices on which energy sources to use, which sectors and areas will be funded, which countries will be partners, and how to regulate and operationalize these processes. These decisions drive this process up or down. Hence, it is the politics that determine the level of (inter)dependency, lock-ins, and flexibility. As indicated before, this transformation will neither rapid nor linear, it will have ups and downs. However, with each passing day, the space it occupies in our lives will expand, and the more effects our lives the more knowledge and in-depth research in this field become required. Also, there has been an ongoing discussion on how to realize this transition justly and transform social, technical, and economic life without leaving

no one behind. With these in mind, energy transitions, experiences of countries and societies, challenges and consequences will be unique and will necessitate unique solutions and pathways. Thus, political science should pay more attention to this issue.

Current literature on energy transition mostly relies on energy security, energy-foreign policy, energy curse, and geographies of energy. Besides, the speed of transition depends on various factors such as financial mechanisms, the adaptation of sociotechnical systems, and demands from consumers, etc., the main research question of this study is how interest groups affect the speed of energy transition. Moreover, do regime types have an impact on this process? This study investigates the impact of interest groups on the energy transition comparing democracies and non-democracies. What was the reason for the US's inability to succeed while Brazil, Denmark, and France successfully implemented their energy transitions? What limited the US from realizing it? Was being a democracy enough? Was it because of the lack of innovation, technology, or financial assistance? In the US case, the attempts remained low due to the consolidated and powerful fossil fuels sector.

For a transformation from one energy source to another, the willingness of stakeholders, particularly energy companies almost a must. Otherwise, they can spoil or slow down this process. Even though, there are interest groups in non-democracies they are unable to function as a veto player. That is why, patronage has been a determining factor in realizing energy transition. That is why, the continuity of patronage is important for the decision-makers. On the other hand, interest groups act as veto players in democracies and lead the process. Among democracies, the absence of a consolidated sector is an important factor in preventing opposition to energy transition. However, if there is a strong opposition groups the possibility of spoiling this process is a strong chance. The research aims to contribute to this literature by looking at the dynamics and bargaining between decision-makers/incumbents and diverse interest groups. Additionally, it shows the crucial role of interest groups in shaping environmental policies. The energy sector stakeholders, environmentalists, multinational companies, and business sectors are together composed of interest groups, and the competition among these actors determines the policy outcome of decision-makers. Together with their strong financial resources, lobbying powers, and influence on political elections, they constitute an important component of this process.

By investigating these research questions, this study aims to contribute to both international relations (IR) and comparative politics literature by looking at domestic-foreign linkages. The main goal of the IR is to understand the relations between

states and analyze the international dynamics, conflict, and role of transnational and international actors. The impact of energy resources, global trade, conflict and cooperation, international agreements, or changing dynamics among actors can be subject to the field of field. Besides, regarding its consequences, the climate crisis cannot be solved unilaterally. It entails collaboration among international actors. As part of IR, energy diplomacy becomes an important part of tackling the climate crisis and ensuring global cooperation. Furthermore, global energy infrastructure, pipelines, and energy routes and agreements link countries to each other (e.g. Nabucco Pipeline, Nord Stream, Paris Agreement). these initiatives also constitute an important part of the global economy and trade. On the other hand, comparative politics seeks to explain internal dynamics and the reasons behind these actions. How do institutions interact with each other, or how does a mechanism impact another one, and what are the implications on social, political, and economic aspects are questions in this field.

The relations between regimes, institutions, ideologies, economies, or policies on various topics can be a subfield of comparative politics. Gourevitch (1978), for instance, explains how IR and comparative politics interact with each other in his seminal work, the Second Image Reversed, and he argues two aspects of the international system impact domestic politics which are the international state system and the international economy. Any decision on these issues not only affects the international system but also impacts domestic politics. Carter Doctrine is an appropriate example in this manner. In January 1980, the President of the US Jimmy Carter stated that the US would use military force in the Persian Gulf if required, in order to preserve US interests. This strategy was implemented due to the ideological and geological competition with the Union of the Soviet Socialist Republic (USSR), to preempt the potential consequences of the Iranian Revolution in 1979 and the invasion of Afghanistan by the USSR, and to secure the supply and control of oil in the Middle East. Conversely, the international system is not free from domestic politics, and most of the time domestic politics, interest groups' positions, Coup d'états, elections, regime type, and if available, coalition partners affect international factors and interactions (Wilkinson 1970). One example of this is the improvement in the Chile-US relations after Pinochet's military coup in 1973. Deteriorating relations during the Allende administration were restored after the military overthrow. Similarly, the intricate nature of energy politics, both internal and external factors have been affected by the decisions on it. This interconnectedness makes the energy transition an indispensable composition of IR and comparative politics.

4. ENERGY TRANSITION AND ITS DIFFERENT FORMULATIONS

4.1 Theoretical Framework

There are varieties of the energy transition. Each country has a different path to follow, and their opportunities and obstacles differ. This, basically, depends on their energy dependence, perception, security concerns, and lock-ins. These components determine the speed of the transition as well. In order to realize this transition, the willingness of stakeholders (interest groups) is a must. Their lobby power, financial sources, providing information, and their ability to influence election campaigns prevent governments from making decisions despite interest groups' wishes. Otherwise, they risk their chances of winning another election cycle, and the incumbent feels insecure about holding elections. Hence, when decision-makers make a decision, they consider the interests of stakeholders. Interests are goals or objectives that actors aim to achieve through political action (Frieden, Lake, and Schultz 2018). Priorities determine actors' decisions, and finally the outcome. Another definition comes from Tsebelis (2002), who argues that domestic political institutions include veto players that can influence government representatives together with the executive, legislature, and judiciary. Veto players are the actors required to change the status quo (Tsebelis 2002). In order to oppose a decision or change an existing one, a particular amount of individual or collective actors come together. These actors constitute veto players, and rules differ in each political system. Each outcome forms a win-set and the size of these win-sets depends on the number of veto players, the ideological distance among them, and their cohesion. The impact of a veto player measures through their capacity to change a policy (Tsebelis 1995). However, this study argues that interest groups' willingness or lobby power would be fruitless if they could not function as a restrictive power.

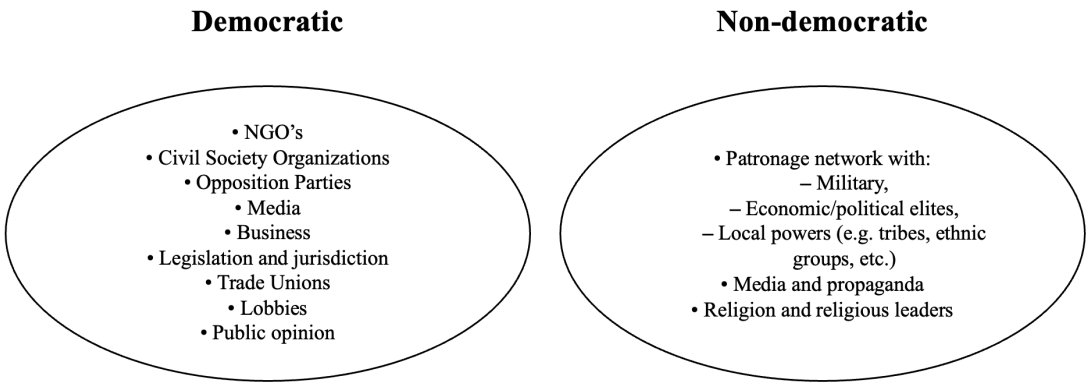
In the lack of effective decision mechanisms and checks and balances, interests would

be unable to affect the outcome. On the other hand, in situations where each institution has autonomy, interest groups can also influence the decision-making mechanism. Lobby groups seek to influence decision-makers and legislators' voting tendencies and compete with each other to convince the decision-makers. Thus, the decision-making process can be seen as a competition among various interest groups (Austen-Smith and Wright 1994). In this regard, interest groups function as veto players and influence decision-makers through their interests. Thus, the basic difference between interest groups and veto players is their ability to impact the decision-making process, and non-democracies do not have veto players due to the lack of a veto mechanism.

That is why, the first section investigates whether veto players have such authority in non-democracies and highlights the difference between democracy and non-democracy. The degree of interest groups' willingness determines the direction and speed of energy transition. The government seeks their consent when implementing this decision, and sometimes, this demand comes from interest groups if it is in favor of their own material interests. However, this only applies to democracies. Even though there are also interest groups in non-democracies, they cannot put pressure on decision-makers due to political pressure, media control, lack of democracy, and the lack of rights. The absence of such constraints prevents interest groups from becoming veto players as is the case of democracies. In non-democracies, the only thing that matters is the survival of the regime, and this is achieved through patronage. Yet, at the same time, as long as the patronage network is maintained, interest groups do not generally rebel against the regime. In terms of the international system, even though there might be pressure to realize this transition, international actors' transformative power is weaker compared to domestic pressure groups. International crises, shocks, or demands have a limited impact on incumbents compared to domestic interest groups. Sanctions, international bans, or exclusion by allies do not pose a threat to the survival of the regime, in fact, help to ensure consolidation within borders.

Figure 4.1 illustrates the differences between democracies and non-democracies in terms of their interest groups. As can be seen, while media, business, or public opinion are recognized as interest groups in democracy, the military, elites, and powerful individuals like the head of a tribe or a religious leader constitute domestic players in non-democracies. Their function, in contrast to democracies, is the continuity of the regime through patronage. According to Weingrod (1968), patronage is a "reciprocal relation between patrons and clients." Patron utilizes its power in order to support and protect some individuals or groups. After a while, those groups who are helped become 'clients', and perform services for their patron. In this context, patronage is

Figure 4.1 Interest Groups in Democratic and Non-democratic Regimes



an intricate relationship between those who protect others by using their power and social position and those who are helped and protected in return. In democracies, even though patronage elements such as hiring or appointments based on political connections or personal relationships may exist, democratic institutions and legal frameworks are generally designed to limit it. Moreover, bureaucrats who engage in patronage practices can face disciplinary actions through institutional mechanisms, and they can also be removed from office through electoral processes. In democracies, there is a bargaining process between these groups and the incumbent, on the other hand, in non-democracies there is no such bargaining process. Since they are appointed officials if they oppose an idea or a policy, they can be removed from their positions and easily replaced with someone else who is loyal to the regime. One can argue that there is not a single type of non-democracies; they vary in terms of their structure, the power of institutions, the power of opposition, and their impact on decision-making mechanisms. In this study, only democracies with a score above 0.80 in V-Dem data (2024) were considered. This is because only in consolidated democracies can interest groups act as veto players and create constraints. That is why, in this study, both democratic and non-democratic regimes are considered as a whole without separating them into subcategories like competitive authoritarianism, totalitarianism.

Thus, democracies are the only suitable regimes in terms of limiting and affecting the decision-makers due to their free and fair elections, checks and balances system, and the rights protected by law. In contrast, lobby groups cannot influence the outcome in non-democracies due to the lack of these mechanisms. However, a veto player does not have to be an individual or a company, in fact, it can be an institution or a partisan veto player (Tsebelis 1995). While institutional veto players

exist in presidential systems, partisan veto players perform at least in parliamentary systems. US Senate, for instance, constitutes an outstanding example of an institutional veto player to constrain the President's political authority. As an example, in 1918, through elections, control of the Senate shifted from Democrats to Republicans. During this period, Henry Cabot Lodge, a Republican member representing Massachusetts in the Senate, became both majority leader and chairman of the Foreign Relations Committee. Woodrow Wilson, who had been president for nearly six years, formulated policies to end World War I. Wilson, with an idealistic approach, desired a "peace without victory," whereas the realist Lodge insisted on Germany's unconditional surrender. When Wilson traveled to the Paris Peace Conference, he did not include senators in his delegation and made the conference results public before discussing them with committee members, which sparked Senate backlash. Wilson took his campaign to the public to secure treaty approval. However, during a nationwide tour in October 1919, Wilson suffered an illness that further impacted his political judgment. In November 1919, Lodge presented the treaty with 14 reservations to the Senate, but due to Wilson's continued refusal to negotiate, the Senate, for the first time in its history, rejected a peace treaty on November 19, 1919 (U.S. Capitol n.d.).

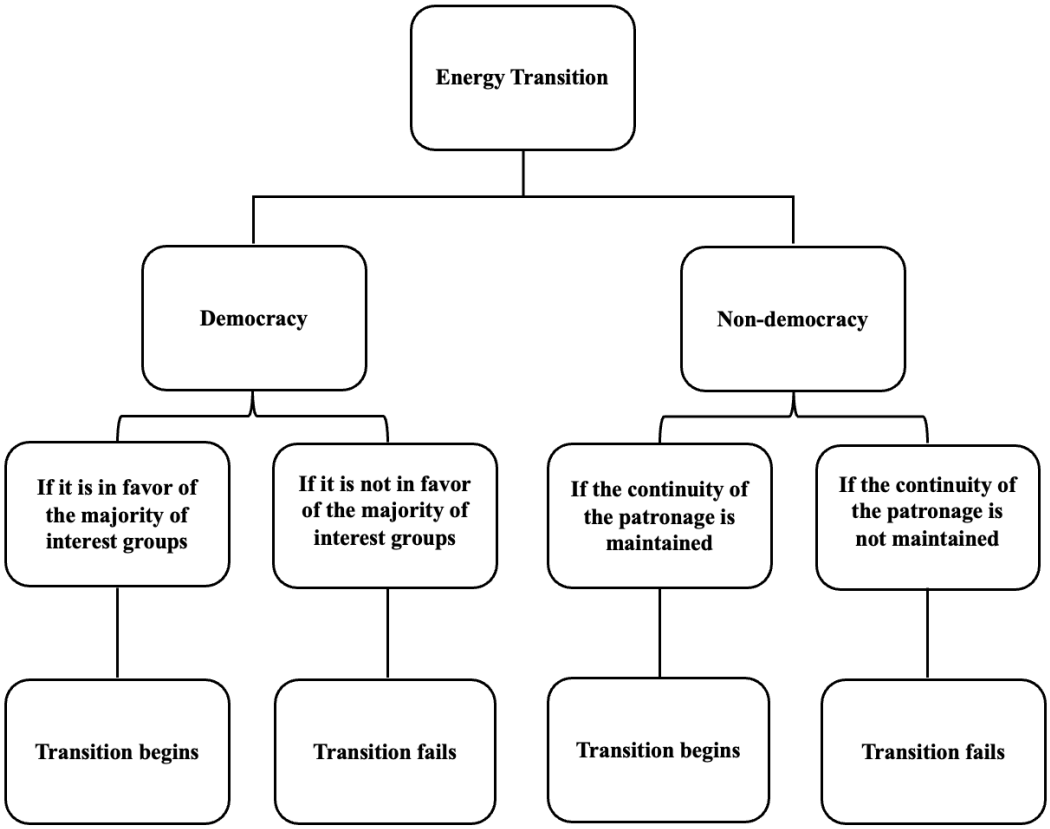
Another example is the American Clean Energy and Security Act of 2009 (ACES), also known as the Waxman-Markey Bill, which aimed to sustain a clean energy economy, reduce carbon emissions, and become energy-independent. When the Obama administration came into power one of the priorities was the clean energy transition. Accordingly, ACES aimed to implement a cap-and-trade system similar to the EU's Emission Trade System (ETS). ETS has been in effect since 2005 and functions to reduce greenhouse gas emissions and facilitate the Union's green targets. Therefore, the system defines a limit on greenhouse gas emissions and companies receive allowances, each allowing the emission of one tonne of CO2eq (carbon dioxide equivalent). They must surrender enough allowances each year to cover their emissions or face fines. The Union achieved reduced emissions from power and industry plants by 47% compared to 2005 levels thanks to the ETS (ec n.d.*f*). Consequently, the Obama administration aimed to create a similar trading system to the ETS and created restrictions on specific sectors, aimed to reduce the US' overall emissions by at least 83% below 2005 levels by 2050. Although the Act was passed by the House of Representatives by a slim margin in 2009, the bill never received a vote in the Senate (Cornell Law School 2021). Because of the Republican majority in the Senate, and the prevention of powerful carbon-intensive lobby groups, this Act never came into power.

These prominent examples highlight the role of domestic factors in ratifying inter-

national measures and illustrate how veto players act as the main determinants in realizing a policy. Figure 4.2 below shows the role of interest groups in decision-making mechanisms and assists in understanding why the Clean Energy Act of 2009 did not pass the Senate. It represents an illustration of the energy transition process of both regimes in terms of how domestic groups react to this process. In democracies, the realization of the energy process depends on the majority of interest groups' willingness —a win-set of interested stakeholders is needed. Businesses, trade unions, civil society organizations, or green activists can form these groups. Consequently, the competition and power struggle among these groups can determine the outcome. If the transition is not in favor of most of the domestic groups, they spoil the process or pose a threat to the incumbent for the next elections by using their veto power. Thus, decision-makers cannot make this decision unilaterally, rather, they have to build a consensus bringing different stakeholders together. On the other hand, in non-democracies, the government does not need to build such a consensus among domestic interest groups, rather it sustains the patronage network among groups in order to maintain the continuity of the system, and as long as this patronage network works, the head of the administration does not care about the dissatisfactions and opposing views. In fact, the independence or the resilience of civil societal organizations, opposition parties, or the business sector is also open to questioning. Consequently, making a comprehensive decision that will affect different parties is more challenging in democracies. Various actors need to be convinced or need to be compromised.

One advantage of democracies is that decision-makers are more likely to follow through on certain commitments they make, and the existence of consolidated institutions that can supply the necessities from this transition compared to non-democracies. Therefore, once a decision is made, there is a higher probability of implementation in democracies. Otherwise, they know they will be punished through elections. Additionally, democracies are concerned about their international reputation in the event of non-compliance. On the other hand, in non-democracies, the lack of accountability creates ambiguity in the long term. That is why, democracies are more predictable regimes in forecasting the future. The only exception to this situation is external shocks. One example can be given in the case of Germany. Germany is one of the leading countries supporting the EU's green transition. Within this framework, the country plans to phase out coal-fired power stations by no later than 2038, and ending the use of nuclear power (The Federal Government N.d.). However, when the COVID-19 pandemic and the Russian invasion of Ukraine struck Germany, the country realized its dependence on Russian gas, faced its inability to meet its energy demand, and faced disruptions in energy, the economy, and public

Figure 4.2 The Stages of Energy Transition in Democracies and Non-democracies



dissatisfaction. The country relied on Russian gas by about 55% and was dependent on Russian coal by 35%. Due to this dependency, Germany was one of the countries that abstained from taking action against Russia when the Russian-Ukrainian conflict began. In fact, German Chancellor Olaf Scholz expressed his concerns by saying "to do so from one day to the next would mean plunging our country and all of Europe into recession. Hundreds of thousands of jobs would be at risk" (Schuetze 2022). However, Germany later changed its stance towards Ukraine. So far, the country has spent approximately 5 billion euros in 2023, and 1.6 billion euros in 2022 on military aid to Ukraine (The Federal Government 2024). Comprehensive transformations like energy transition are implemented in the long term to minimize potential negative effects in democracies. Even though, the energy transition is progressing slower than expected, the country is still sticking to the plan which is Energiewende, which declares that Germany will achieve its environmental targets (Lontay 2024). Despite numerous economic and energy crises, Germany aims to generate 80% of its electricity from renewable energy sources by 2050 under its Energiewende policy. Additionally, the country aims to reduce emissions by at least 55% by 2030 compared to 1990 levels, 70% by 2040, and at least 80-95% by 2050 (Federal Ministry for Economic Affairs and Climate Action 2019).

On the other hand, in non-democracies such concerns do not exist partly because elections are not free and fair. That is why, their energy policies vary in the short term and interests influence decisions. One prominent example of this is China. At the beginning of the 2000s, China relied heavily on coal in its industry, heating, electricity generation, and energy consumption. However, there has been a huge decline in coal consumption since 2015, and there are many nuclear power plants under construction. The absence of veto players and mechanisms in decision-making enabled the decision-makers to implement rapid and comprehensive transformations within a short period of 20 years. However, one cannot be sure that this trend will proceed for a long time because of short-term interests and the lack of a veto mechanism. If China is convinced of the necessity of coal for further development goals, there might be a return phase to coal. That is why, democracies are more predictable in terms of their long-term energy policies. The existence of a large number of veto players both constrains the incumbent on one hand and prevents short-term decision-making on the other.

In democracies, decisions are made through the combination of various components. Domestic interest groups play a major role in democracies in shaping policies. They impact reforms, educational, environmental, or health policies. After a prolonged negotiation process, these decisions are taken by the executive body. Both negotiation, decision-making, and implementation processes need support from actors. The

incumbent wants to make sure that the majority of interest groups are satisfied with the outcome to sustain cooperation in the next election. On the other hand, if the incumbent feels a risk about staying in the office, may withdraw from the decision, and look for a better commitment.

This decision-making process is quite similar to what Putnam (1988) argues in his essential work, Diplomacy, and Domestic Politics: The Logic of Two-Level Games. According to him, central decision-makers conduct two-level games with both domestic groups and international counterparts. Level I constitutes the international system and can be multinational firms, transnational advocacy groups, and international organizations At this level, the head of the delegation submits their proposal and tries to convince their international counterparts. During the bargaining process, each delegation tries to maximize their gain in order to satisfy the national level and to reduce the pressure on themselves. At the national level, which is Level I, delegation introduces the outcome and domestic groups put pressure on the government to adopt policies or revise them in favor of themselves, and the incumbent takes these demands seriously not to lose support, and to preserve their seat for the next term. The national level is where the incumbent is looking for a ratification. Inherently, this stage contains a high level of uncertainty due to the number of veto players, and the power-sharing mechanism. The incumbent tries to convince various actors with different interests at this level. This domestic level of negotiations includes domestic political institutions, NGOs, civil societal organizations, bureaucrats, public opinion, politicians, activists, etc., and domestic political institutions are important determinants in the decision-making process and constitute a constraint according to their impact power. At this level, the main difficulty is to find a common ground for all stakeholders that is acceptable, as the lowest common denominator.

The main concerns of states are their national interests. Reelection, ideology, and policy objectives are three possible dimensions of a politician's interests. Interest groups, on the other hand, care about money and profit for the groups they represent (da Conceição-Heldt and Mello 2017). The robustness and persistence of the agreement depend on the satisfaction degree of the national level. Each decision taken on the international stage is a composition of domestic-level and international-level bargaining processes. If any key player at the domestic level is dissatisfied with the outcome of international negotiation, it may spoil the process. Putnam defines both levels' outcomes as win-sets, and the smaller the win-set, the shorter the survival of the agreement. For a successful agreement, both win sets should overlap. This theory highlights the importance of the domestic-foreign linkages and domestic-level interest groups' impact on the decision-making procedure. Decisions are not only

taken on the international stage but also on the domestic level through multi-staged bargaining processes. Particularly in democracies, the executive body implements these decisions by consulting with political parties, civil social organizations, businesses, green activists, and the opposition. These domestic-level actors determine the viable options at the international level based on their role as veto players in democracies and restricting the win-sets for the governments.

One of the significant examples of this situation is the implementation of the European Green Deal (EGD). The head of the European Commission (EC), Ursula von der Leyen, announced EGD when for the first time she was appointed for this position on 11 December 2019. With EGD, the EU aims to reduce its greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels and to become the first climate-neutral continent in the world by 2050 (EC n.d.*b*). Also with these goals, the EU tries to reach the Paris Agreement's targets as well. The EC also announced a legislative proposal called the 'Just Transition Fund' on 14 January 2020, which aims to support the most affected and need financial assistance countries in the decarbonizing process. The fund also aims to support countries and their societies in climate transition, and it is based on the principle of leaving no one behind. According to this fund, the EC will provide support to member states, particularly to the most negatively impacted ones. €19.7 billion will be provided to member states during the first period between 2021 and 2027 (EC n.d.*e*). Another significant step was taken in July 2020, when the EU Summit endorsed the creation of a €723 billion Next Generation EU (NGEU) initiative to address the impacts of COVID-19 (EU n.d.). The Recovery and Resilience Facility (RRF) is a key component of the NGEU package and according to RRF, national recovery and resilience plans must include green targets to receive funding and must also ensure that they do not harm the environment (Ladi and Tsarouhas 2020; Ladi, Tsarouhas, and Copeland 2024). According to the requirements, plans must allocate at least 37% of their total spending to investments and reforms that facilitate climate goals (EU n.d.).

Additionally, on July 9, 2021, the Union announced the European Climate Law in order to implement these targets and it entered into force on 29 July 2021. According to this law, unilateral agreements that member states sign should comply with the EU law and regulations. Thus, the EU also instrumentalizes climate and energy policies in implementing its supranational governance structure. The law also contains a 2040 climate target based on the 2030-2050 greenhouse gas budget (EC n.d.*c*). On July 14, 2021, the EC presented a proposal called 'Fit-for-55' to achieve its 2030 and 2050 climate targets. Fit-for-55 focuses on the main areas; accelerating the transition to renewable energy, improving energy efficiency, developing clean

and innovative technologies, and empowering citizens to take part in the transition to a low-carbon economy (EC n.d.*d*). The initiative supports the transition to a more sustainable and resilient economy. In early 2018, Commissioner Miguel Arias Cañete stated that energy transition will continue to be the answer to geopolitical uncertainties faced by the Union (Youngs 2021). Given crises such as shortages in energy supply due to the COVID-19 pandemic and Russia's intervention in Ukraine, these environmental decisions not only indicate the Union's climate policy but also the internal dynamics of collective securitization (Sperling and Webber 2020). However, the EU relies on a variety of supply and demand factors, such as geopolitical conditions, energy diversification, operational costs, and weather conditions. That is why, despite the EU's commitment to implement this transformation, it will require decades to fully integrate each member state and its functions into this new system (Cotella, Crivello, and Karatayev 2016). Consequently, even though the EGD represents an important step toward energy transition, each country faces its own set of challenges in achieving these goals and it is difficult to convince countries to implement these requirements.

Take, for example, Poland, which is the second-highest coal consumer after Germany. However, the country is not as enthusiastic as Germany in phasing out coal because both hard coal and lignite are crucial for the country's development. Poland is the largest country in coal production in Europe, 42% of the total supply is provided by coal, and the country generates 70.4% of its electricity from coal (IEA n.d.*i*). Consequently, the country is highly dependent on coal. When the Court of Justice of the European Union (CJEU) decided to cease the country's biggest coal mine, Turów, close to the border between the Czech Republic and Germany due to the case brought by the Czech Republic in 2015, there were opponents from both government and the society and they refused to close the mine. Accordingly, the Czech Republic criticized Poland's extension of the Turów open-cast lignite mine's operating permit and Poland was charged with violating the EU law by granting a six-year extension to the mining permit without conducting an Environmental Impact Assessment (EIA). The rule decided Poland's actions posed serious environmental harm and a threat to water resources (CJEU 2021). However, Poland did not comply with the decision. In fact, there are huge protests defending the Turów coal mine because the mine generates about 5% of the country's electricity. Additionally, the power plant also provides 1,400 residences, hospitals, and schools with heat and hot water in the town of Bogatynia. Workers are worried about losing their jobs defending the coal mine against the CJEU decision (Easton 2021).

Eventually, the Polish government did not acknowledge the decision and the coal continued to operate. On May 29, 2024, CJEU published another decision and

announced a daily penalty of €500.000 until the interim measure is complied with in full. Thus, the total amount of payment was declared as €68.5 million for the period from 20 September 2021 until 3 February 2022 (CJEU 2024). Currently, it is uncertain whether Poland will pay the penalty or not. Thus, the Turów case continues to create a conflict between the green movement and the labor movement, and it seems it will remain a conflict as long as dependence on coal is not reduced, and socio-technical needs are not aligned accordingly. The government declares that the country needs financial assistance in order to realize the green transition and highlights the importance of public opinion and the significance of the consent of the people realizing this transition. Thus, the government is engaging in a two-level game between the EU and the public in terms of the EU's environmental targets and the country's capabilities. At this point, the EU tries to convince Poland by offering more funding from the Just Transition Fund. The government, on the other hand, raises its hand against the EU while preserving its position in the eyes of the public.

Another implementation is the National Energy and Climate Plans (NECPs) which are developed by the EU to track the capacities and advancements of the members in their climate targets. Each member state must design a 10-year integrated national energy and climate plan for the years 2021 to 2030 until 2019 (Maris and Flouros 2021). Accordingly, Poland published its NECP for 2021 and 2030. The country aims to reduce its carbon emissions by 7% compared to the 2005 level by 2030, achieve 14% renewable energy in transportation, and increase renewables in total energy consumption by 21-23% by 2030 (Ministry of Climate and Environment 2019). It is observed that these objectives remained low when compared to the EU's 2030 targets. In fact, Poland declared that it was opposed to the concept of a low-carbon economy from the beginning of the EC's previous climate and energy plan in 2014 (Maris and Flouros 2021). Thus, it is unlikely to accept the EU's environmental targets until the Polish government convinces domestic interest groups.

Just like the EU and its green targets, there are various studies investigating the two-level games on environmental policies. For instance, Haffoudhi (2005), investigates the effect of pressure groups in international environmental agreements (IEAs) and argues that political constraints bind the hands of national governments in the negotiation process. Through their contributions and lobby power, pressure groups impact the outcome of international agreements. The government chooses a pressure group among many according to their possible contribution at the international level. Agrawala and Andresen (2001) focus on the future of climate policies through the two-level games and investigate domestic and foreign interactions. According to the study, decision-makers consider national interests and domestic policies while

making decisions at the international level. Thus, the study establishes a framework for the failures of countries on their environmental commitments due to their domestic constraints. Breton et al. (2010), investigate the stability of IEAs when players have the option to follow the terms of the agreements or to break them, and when stock externalities are taken into account. The analysis demonstrates that whether an IEA stabilizes into full cooperation or defection depends on the size of the original coalition and the degree of pollution. It indicates that partial or complete collaboration can be encouraged by punishment (stick) or lowering its cost (carrot). Furthermore, in the absence of penalty costs, the outcome is inevitably cooperative, and the environmental costs are inversely correlated with the number of signatories.

Grand (1998) explores the scenarios under which international environmental negotiations may be initiated. The study considers situations where all participating countries have existing domestic environmental policies and potentially strict regulations to address damage caused by pollution. Alternatively, some countries may already have environmental policies while others do not, influencing the range of feasible agreements. Distefano & D'Alessandro (2021) investigate under what conditions IEAs can effectively fulfill the emission reduction targets that have been accepted. They compare two countries with different economic structures and technological development and argue that socio-economic dynamics are crucial in determining the success and failures of IEAs. Accordingly, poorer countries may prefer to set lower emission reduction targets, However, when climate risks increase, richer countries have to take on more responsibility, and this leads to lower emission reduction targets in IEAs.

These examples illustrate the domestic-foreign linkages in environmental politics and investigate the two-level games in international environmental agreements. On the other hand, there are not many studies explaining the domestic bargaining process through the two-level game framework. Additionally, these studies do not demonstrate the difference between regimes —democracies and non-democracies— in the decision-making process. This study, on the other hand, argues that this bargaining process cannot be limited to international decision-making processes, further, can be conducted in any decision-making procedure in domestic politics in democracies. That is why, the measurement in the second chapter will only focus on electoral democracies. The lack of a free and fair election and to overthrow of the government in this way prevents interest groups from being a veto player in non-democracies. That is why, non-democracies are excluded from the following chapter.

4.2 Democracy – Non-democracy Comparison on Energy Transition: Australia and China as Case Studies

However, the advantages of democracies over non-democratic countries do not mean that democracies can achieve this transition easily. On the contrary, if democracy is highly dependent on fossil fuels, has companies with high market capitalization, and fossil fuels are suitable for national interests, no matter how necessary this transition, conditions, and interest groups constitute constraints over decision-making. Energy-dependent countries become vulnerable to carbon-intensive industries and the incumbent becomes unwilling to take action. Once a country advances in the fossil fuel sectors, the financial, technical, and social requirements necessitated by the transition increase. As these requirements become complex, the cost increases and the incumbent hesitates due to concerns about not being re-elected. Thus, national circumstances and capabilities are one of the driving factors in this process. An example of this is the Australian and Chinese cases of energy transition. Thus, in the first section, there will be a comparison of Australia and China in order to demonstrate the constraints in democracies in realizing this transition. The subsequent section will investigate the impact of interest groups on the decision-making process by looking at electoral democracies.

Australia and China's comparison is crucial in terms of their energy trends, and to understand how domestic political institutions and interest groups impact decisions in different regimes. Both countries are industrialized countries, members of G20, and have consolidated carbon-intense energy industries with worldwide companies. Both Australia and China have coal mines and highly depend on coal. They are also similar in terms of their historical energy utilization. One exception is their population growth and their regime types. China's population growth remained zero in 2022 and its 10-year average is 0.49% according to World Bank (2021). This is mostly because of the country's one-child policy during the late 1970s. This policy was adopted in order to control the rapidly growing population. In 2013, for the first time, the country introduced flexibility in the one-child policy and allowed to have a second child for parents who were only children themselves. Then, in 2016, China changed the limit on the number of children and allowed per family to have from one to two children (Britannica 2024*b*). On the contrary, there is no restriction on children born in Australia, and a 10-year average has been measured as 1.34% (2021). However, with the flexibility in the one-child policy, similarity in population growth can be expected between China and Australia over the next few decades. Considering their population growth is important because energy needs

Table 4.1 Australia-China Comparison

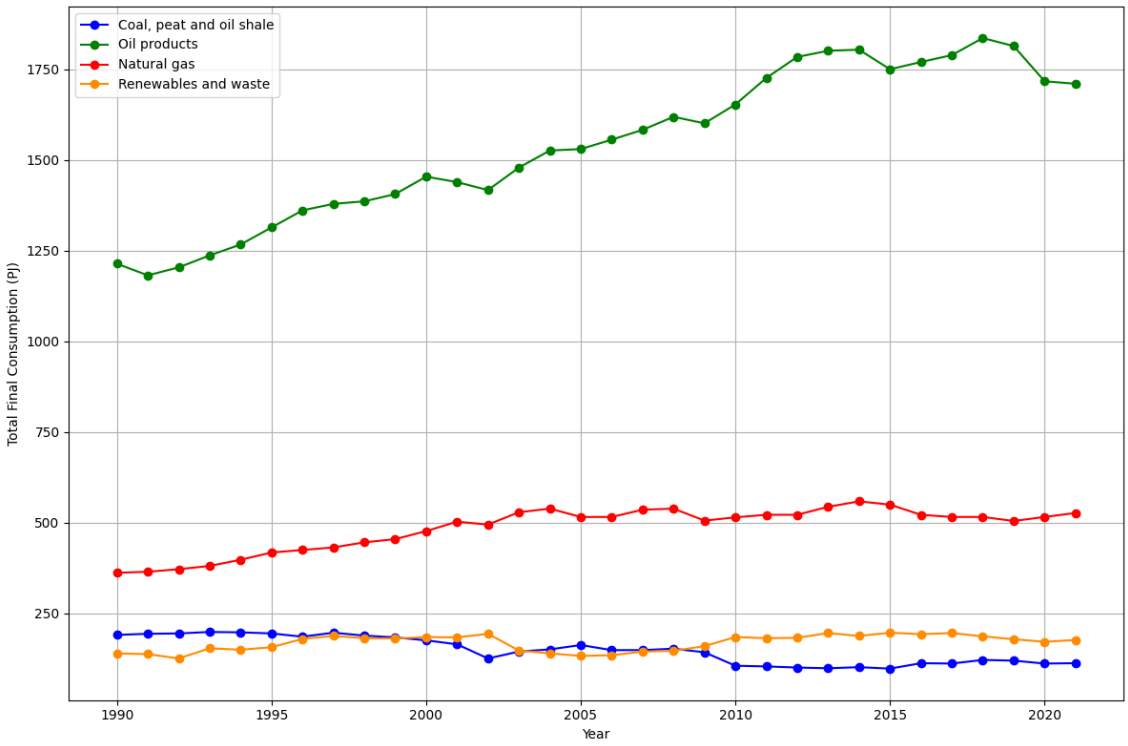
	Australia	China
Population growth (10-year average)	1.34%	0.49%
G20 Country	✓	✓
Energy Dependency (fossil fuels)	✓	✓
Top 10 Coal Producers	✓	✓
Industrialized	✓	✓
Regime Type (Democracy)	✓	✗

and consumption vary according to the population of countries. Table 4.1 above illustrates the similarities and differences between these two countries.

Despite all these similarities, their energy transition paths are different. For instance, in the case of Australia, the country derives 51.7% of its energy consumption from oil products, 15.9% from natural gas, and 23.6% from electricity. 49.2% of total electricity generation is derived from coal and 18.1% from natural gas. Coal is the highest energy source in terms of energy production by 62.6% and natural gas is the second by 30.2%. Additionally, there has been an increase of 361% in natural gas production and 66% in coal production since 2000 (IEA n.d.*a*). Australia aims to generate its electricity from renewable energy by 82% by 2030, reduce its greenhouse gas emissions by 43% compared to 2005 levels by 2030, and become a net zero emitter by 2050 (Australian Trade and Investment Commission 2024). Additionally, the country is implementing another 2030 target for critical minerals and reforms for the gas market in order to sustain energy security (IEA n.d.*b*). However, when looking at Figure 4.3, it can be seen that the share of renewables remained limited compared to other energy resources over the years. Although there has been a slight decline in coal consumption, the overall pattern has not changed much.

The country's stance on IEAs does not appear promising as well. For instance, in 1998 Australia signed the Kyoto Protocol, however, it refused to ratify it until 2007 (of Australia 2017). Additionally, in 2002, Australian Prime Minister John Howard stated that the country would refuse to ratify the Protocol and added "It is not in Australia's interests to ratify. The Protocol would cost us jobs and damage our industry" (EC 2022*a*). Considering this statement with the fact that Australia was the largest coal exporter country in the world at that time and was an industrialized country, the restrictions imposed by the energy market are better understood. Most

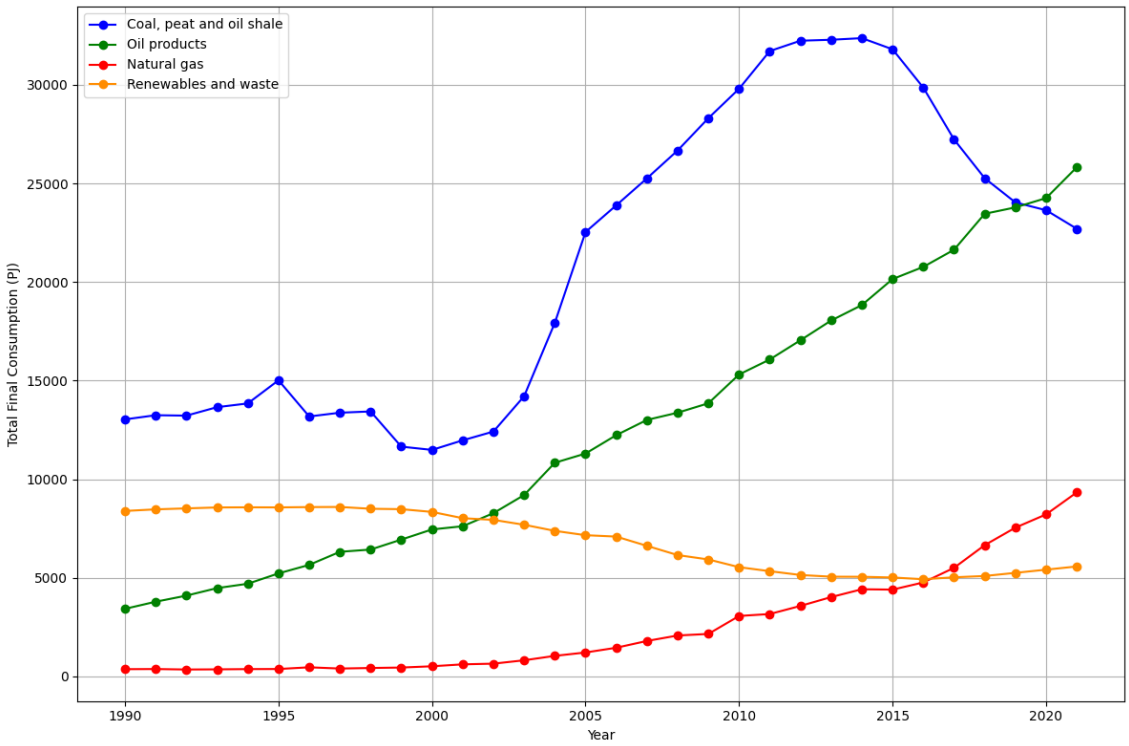
Figure 4.3 Australia's Energy Consumption from 1990 to 2021



importantly, the Future Gas Strategy published by the Australian government in May 2024 highlights the country's dependence on fossil fuels. According to this report, the Albanese administration aims to facilitate the country's green targets and transition by increasing gas production and consumption (**?**). The gas will function as a transit source to net zero. However, considering the energy transition is directly linked to the reduction of greenhouse gas emissions, this explanation is unacceptable.

In fact, the government states that this strategy's objectives include sustaining Australia's reputation in the eyes of its foreign trade partners, helping them to reach their green transition, and ensuring the continuity of investments in Australia. Thus, it has been observed that 'being a reliable partner' was the main determinant while making this decision. Even though the strategy emphasizes the importance of reducing carbon emissions, finding alternative and green energy sources, and changing the role of gas by 2050, it still highlights the importance of gas in global and domestic energy transformation. The government will also support the country's current gas projects, the largest ones managed by Chevron and Woodside Energy Group (Ritchie 2024). Oil constitutes 31.7% of the total energy supply for the country (IEA n.d.*a*), and considering these developments, it is clear that the transition away from fossil fuels will not be easy for Australia.

Figure 4.4 People's Republic of China's Energy Consumption from 1990 to 2021



China, on the other hand, is a crucial example compared with Australia in terms of its energy resources and policies. Even though they have similar energy sources, their paths differ. China meets its energy consumption from electricity by 28.1%, 26.6% from oil products, and 23.4% from coal. The country's electricity generation derives from coal 63%, 15.6% from hydropower, and 7.6% from wind. In terms of production rates, coal is the highest energy source at 70.8%, and crude oil follows with 6.7% of production (IEA n.d.*e*). It can be seen that China has a diversified energy usage compared to Australia. Even though China is the biggest coal producer and consumes more than half of the world's coal, its dependency on coal has been rapidly decreasing in recent years, especially since 2015 (IEA 2023*a*). There has been a phase-out of the coal process, mostly because of the pollutants generated from coal. China's prominent strategy for phasing out coal is transitioning to nuclear energy. In fact, there are 56 operable nuclear power plants in China and 30 power reactors under construction (World Nuclear Association 2024). Additionally, the country aims to limit the carbon dioxide peaking before 2030 and become carbon zero by 2060 (Ministry of Ecology and Environment 2022). The energy consumption patterns of the last 30 years also indicate the consistency of carbon reduction goals. The share of energy sources is demonstrated in Figure 4.4 above.

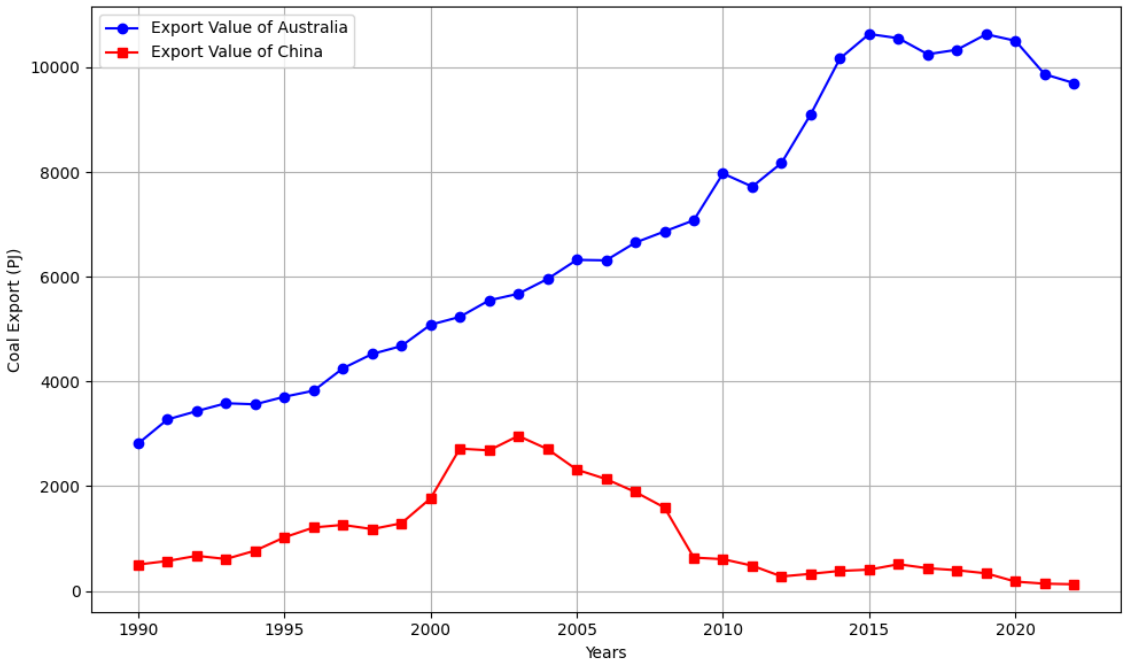
One of the driving factors in reducing carbon emissions is China's increased foreign

trade with the EU. In 2023 and in the first quarter of 2024, China was the major exporter to the Union and the third country in imports after the US and the UK (Eurostat 2024). As a continuation of the Green Deal and the European Climate Law, the EU announced the Carbon Border Adjustment Mechanism (CBAM) mechanism which will be implemented in 2026 (EC n.d.*a*). The CBAM is a policy that applies a carbon price to carbon-intense imported goods. The goal of the CBAM is to equalize the conditions for domestic producers, who face carbon pricing within their own country due to ETS, and to encourage the use of low-carbon technologies and products in third countries. It will include a carbon tax and a quota system. The carbon price is applied to the carbon emissions associated with the production of imported goods, and it is calculated based on the difference between the domestic carbon price and the carbon price in the exporting country. This mechanism is designed to prevent carbon leakage due to the implementation of ETS for domestic producers. After the CBAM, the conditions will be similar for domestic and foreign producers, and the EU will be able to keep its domestic producers and sectors within the borders of the EU and prevent carbon leakage, especially to periphery/underdeveloped countries. As the advantaged party in trade with the EU, China will likely strive to transition to low-carbon production to avoid losing this advantage because of the CBAM.

Comparing the energy consumption of the two countries, it is observed that China's coal consumption is significantly higher than that of Australia. However, the reason for low coal consumption is that Australia exports much of the coal it produces. Thus, the way of instrumentalizing coal is different in these countries. Australia is the second coal exporter with 390 million tonnes (MT) after Indonesia (IEA 2023*b*). Additionally, the country is the largest liquefied natural gas (LNG) exporter in the world in 2023 (IEA 2024*a*). On the other hand, China consumes what it produces from coal. Figure 4.5 below illustrates the difference between Australia and China in terms of their coal exportation ranks.

When comparing the energy consumption trends of these two countries, it can be observed that China has rapid increases and decreases in energy consumption compared to Australia. While Australia has had a more stable progression in energy consumption over the past 30 years, China's graph reflects rapid increases and decreases in energy sources. Especially, since 2015, the rapid reduction in coal usage, construction of nuclear power plants, and electrification process together with energy diversification have been happening quickly. The reason for the difference between the two countries lies in Australia's failure to conduct the two-level game with domestic interest groups. When Australia failed to convince and satisfy its national interest groups, the speed of the energy transition fell behind China's. Although

Figure 4.5 Comparison of Australia's and China's Coal Exports from 1990 to 2022



Australia has a 2030 target for clean energy, when it comes to implementation, Australia still lags in expectations. On the other hand, China does not have as much concern about satisfying its domestic-level interest groups as it does about maintaining the continuity of patronage. The survival of the regime may require changes in the conditions, allies, and patronage, and since there is no limitation in the decision-making mechanism, or checks and balances, changes can be achieved easily. This is the primary reason behind the fast transition in non-democracies, particularly in China. On the other hand, how sustainable is this transition is a matter of other research.

Another crucial factor is the lack of a free market in non-democracies. In China, the government does not need to consult other actors when making decisions regarding coal consumption, whereas in Australia, the agency of companies creates a constraint. For instance, the world's largest coal mining company by market capitalization, China Shenhua Energy is a state-owned company (Statista 2024*a*). Also, one of the world's largest oil and gas companies, PetroChina is another state-owned company as well (PetroChina 2022). On the other hand, Australia's biggest coal company in terms of its market cap, Yancoal is a public company (Yancoal n.d.). Examples can be varied. For instance, Saudi Aramco is the world's largest energy company, and it is a state-owned company apart from the IPOs in 2019 and 2020 (Saudi Aramco 2024). After Saudi Aramco, Exxon Mobil and Chevron, which are

respectively the second and third largest energy companies in the world, are non-state-owned companies (Chevron 2023; Exxon Mobil 2023). Furthermore, Russia's largest gas company Gazprom is a majority state-owned company (Statista 2024*c*). In this regard, Novatek is an exception. It is the third-largest natural gas producer in Russia after Gazprom (Statista 2024*d*), and despite being a non-state-owned company (Novatek 2006), the CEO of the company, Leonid Viktorovich Mikhelson, has always been associated with the closeness to Russian President Putin (EUR-Lex 2024). Therefore, it cannot be said that it is an independent company from the government. Thus, these examples illustrate that democracies face significant constraining factors that reduce the probability of governments making decisions independently.

All in all, energy transition requires costs and benefits and creates winners and losers (Meckling et al. 2022). Supply-side policies, like regulations on fuel efficiency or mandates for renewable energy adoption, mainly impose noticeable financial burdens on businesses. Industries at a disadvantage, such as fossil fuel producers and energy-intensive sectors, are highly motivated to oppose such policies through lobbying efforts. Because these companies are among the largest companies in the world in terms of their market caps, they can be highly influential on both electorates and decision-makers by using their power. However, as demonstrated above, these interest groups can be influential only in democracies because of the authority they possess. Constraints and restrictions impose significant limitations on governments.

In this regard, Australia is one of the significant examples. Even though the country is committed to its 2030 and 2050 targets, when it comes to practice, the government is failing. The Future Gas Strategy is an explicit example of this situation. Because the incumbent fails to convince domestic interest groups, the government's decision is still in favor of carbon-intensive industries. Thus, the failure of the Australian government to conduct a two-level game with veto players leads to this outcome. On the other hand, the lack of agency, rights, and independent officers from the government prevents interest groups from being veto players in non-democracies. Non-democratic countries do not face restrictions as democratic countries face and if the energy transition towards a carbon-zero system is in line with their interests, non-democratic countries are able to fulfill the requirements. In the case of China, the country aims to phase out coal due to the air pollution caused by lignite. The country mostly relies on human capability and resources in its development goals, and air pollution poses a threat to its long-term strategy. That is why, China takes precautions against any material costs that could threaten it. Therefore, the rapid decline in coal consumption is a decision taken not for environmental reasons, but to avoid material costs. In addition, China is able to make these decisions

in a short period of time due to the absence of veto players in domestic politics. This constitutes the main difference between democracies and non-democracies in terms of the decision-making process in energy transition. The subsequent chapter investigates the reasons for the differences among democracies.

5. VARIETIES OF ENERGY TRANSITION AMONG DEMOCRACIES

5.1 Theoretical Framework

The previous chapter explores the differences between regimes in terms of their decision-making processes and investigates how veto players in Australia block decisions when carbon-intensive sectors are negatively affected. This chapter, on the other hand, explores the differences among democracies in energy transition. As indicated previously, the main reason for realizing or failing in this transition depends on the existence of powerful energy companies because of their lobby power and the ability to impose constraints on the government. Therefore, this chapter investigates the varieties of energy transition among democracies and argues that countries with a high number of carbon-intensive energy companies face more restrictions in implementing energy transition because these companies veto such decisions to protect their own interests. However, before measuring their impact power on decision-making mechanisms one should ask the conditions that created this situation.

Without veto players' support and assistance, the speed of the transition or the realization of the transition is less likely to occur. Veto players' support is almost a must for change in the status quo (Tsebelis 2002). These actors shape the outcomes to pursue their interests. Therefore, Historical Institutionalism (HI) considers veto players as crucial in their ability to influence decision-making mechanisms and institutions. The outcomes taken by institutions are important not only in terms of limiting choices or influencing individual strategies but also in understanding how interest groups express themselves (Thelen 2002). Decisions are shaped by the capacity of interest groups according to their influencing power. Thus, HIs view institutions as a conflict of interest, and the outcomes are shaped by this competition. Therefore, achieving sustainable energy transitions depends on the political dynam-

ics. Decisions taken can push countries down an irreversible path. Once a critical juncture is passed, overcoming dependency becomes very difficult. When the entire system becomes reliant on a specific energy source, interest groups are also unlikely to support the transition (Fouquet 2016*b*). This is why many countries struggle to take action on energy transition today. That is why, the following part examines the path dependencies and lock-ins created by carbon-intensive energy companies.

According to Levi (1997), once a country or a region starts to go in a certain direction after a while it becomes costly to change this direction. Even if there are options to choose later on, established rules and systems prevent reversing the original decision easily. Thus, whatever happens previously will influence the potential results later (Sewell 1996). A system usually locks in when there is technical interdependency, large investments, and broad economic impact as in the case of the QWERTY keyword (David 1985). The QWERTY keyboard has become widely accepted as a standard over the past years and prevented other potentially more efficient keyboards from gaining popularity. Thus, timing and sequence of events have specific importance when a broad spectrum of social outcomes becomes realized. Significant results can arise from relatively minor or incidental events, like the QWERTY keyboard, and once the system lock-ins, it may become impossible to reverse (Pierson 2000). Just like in technology, path dependencies determine the paths in energy systems. However, sometimes these paths become inefficient over time and require the destruction or a replacement by another path (Klitkou et al. 2015). Non-renewable energy systems are prominent examples of this due to their unsustainable future. Limited resources, high carbon emissions, and the lack of self-sufficiency are some of the reasons behind this inefficiency.

Path dependencies create energy-dependent sectors and systems, and this makes countries vulnerable to exogenous and endogenous shocks and forces systems to shift toward a new one. That is why, in order to understand the direction of the energy transition, one should study the path dependency and lock-ins. Vulnerabilities and restrictions prevent countries from transforming their systems towards a green future. Additionally, the high costs of enabling and sustaining these transitions cause market failures and free riders. For instance, in France, it is hard to break nuclear power's status quo and move towards new energy systems due to their lock-ins in nuclear power and electricity generation from it. Once the energy system is locked into an energy resource, the incumbent barely achieves to break from it. Therefore, during the establishment of the energy system, it is essential to avoid being fully committed to that specific energy source. If the wrong path is followed, the results can have irreversible effects (Fouquet 2016*b*).

Similar to the energy transition, path dependencies vary due to the lock-ins in their systems. Path dependency usually prevents carbon-dependent countries from moving away from non-renewables and creates a dependency on carbon-intensive energy resources, consolidates markets and industries regarding this dependency, and creates lobbies in favor of fossil fuels. This prevents diversification in energy sources and investments which pose a threat to energy security. One can argue that technology can be a leading factor in breaking path dependency, however, the impact power of the technology also depends on the decision-makers' choice. Additionally, the lack of innovation can be a disruptive factor in realizing energy transition. In the absence of investment, technological developments and innovations in the energy sector remain limited, and this fosters dependency. Besides fossil fuels industries constitute a powerful lobby to gain support from the government and affect the allocation of state subsidies. Eventually, it is the innovators and individuals that are leading the transformation often with the support of government policies (World Economic Forum 2020). The powerful lobbying activities of the carbon-intensive sectors play a crucial role in determining the long-term support for innovation and investments, therefore the pathways, and mostly these decisions taken in favor of these interest groups. These lobbying activities can be information transfer, mediation with third parties, financing their election campaigns, or open support in the elections (Grossman and Helpman 2001). As relations with stakeholders become more complex and the energy system locks, the cost of change increases, and breaking the status quo becomes more difficult. Thus, technology, as a variable, is a crucial factor in the direction of energy systems, however, it is highly dependent on the political atmosphere and the powerfulness of interest groups.

As carbon-intensive energy companies gain power over time, the possibility of reducing carbon emissions and achieving an energy transition toward a green system decreases. This is primarily because of their impact power on decision-making mechanisms. Once the critical juncture is passed, it becomes increasingly difficult to achieve this transition without the consent of veto players. This study argues that since the direction of energy politics depends on the agenda of veto players, the critical juncture is where one of the veto groups gains dominance over the other groups. Therefore, in countries where carbon-intensive energy sectors are consolidated —meaning their market capitalization, employment rates, and influence surpass those of other sectors, decisions regarding energy transition are not easily made. These decisions are often vetoed by carbon-intensive sectors, and even if decisions are made, decision-makers may struggle to implement them. When carbon-intensive energy companies became powerful actors due to the reasons mentioned above and had high veto power, other interest groups such as renewable-related energy compa-

nies, NGOs, or green activists could not succeed in opposing their demands. This is the primary reason for the variety of energy transitions in democracies.

That is why, the main determinant in this regard is how willing veto players are to realize this transition. This research mainly focuses on the carbon-intensive veto players, however, environmentalists constitute the opposition group. In fact, according to Haffoudhi (2005), there are only two dominant groups in domestic politics who can overcome the free-riding problem which are the environmentalists who want carbon reduction, and the industrialists/producers who want to continuity of the existing energy system. Only these two groups can organize politically and impact the decisions of the government in environmental politics. These groups' political contributions, benefit-cost structure, and social welfare determine the outcome and the coalition partners. Additionally, the political competition among different groups positively affects the reinforcement. Policymakers utilize positive reinforcement mechanisms to advance their own political interests. Environmental governments lock in decarbonization efforts by creating strict regulations, while anti-regulation governments provide even less support for clean energy due to their strategic interests. Therefore, the effectiveness of positive reinforcement on real outcomes largely depends on government preferences (Aklin and Urpelainen 2013). The strength of veto players (energy suppliers, consumers, business interests), the number of stakeholders that will be affected by this transition, and the interaction between them are the determinants of this process (Lockwood et al. 2017). That is why, in the absence of any of these dominant opposition groups (e.g. fossil fuels sectors, energy companies, or environmental activists) the decision-making process and implementing it become easier. In contrast, if there is a consolidated energy sector, the powerfulness of veto players binds the government from making decisions toward a green future.

5.2 Research Design

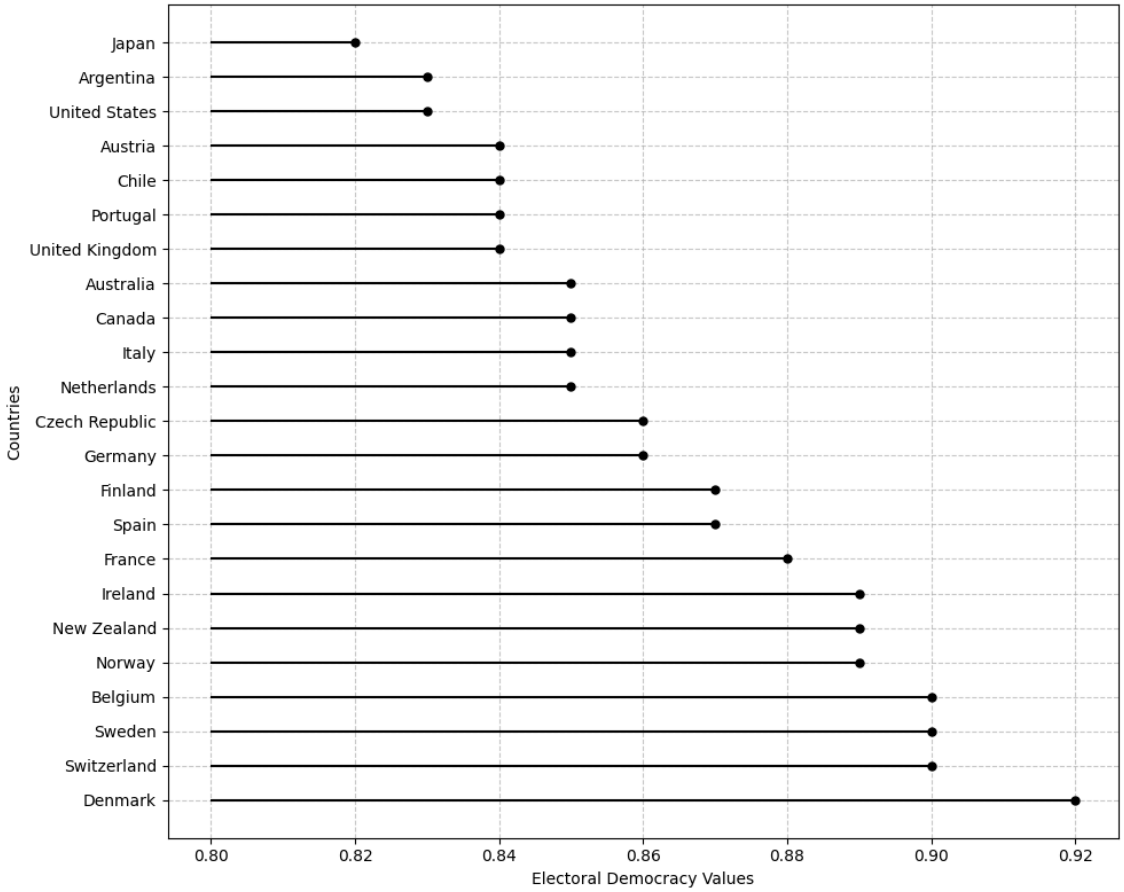
This section contains the research design of the study, the timeline, the case selection, the model, and the empirical findings. The unit of analysis of this section is country-year and all the estimations are conducted in STATA version 17. The main inquiry of this study is to understand the relationship between a country's carbon-intensive energy companies and its energy transition. The thesis hypothesizes that as the power of carbon-intensive energy companies increases, the energy transition decreases. The main independent variable is carbon-intensive energy companies.

The second independent variable is the annual fossil fuel production of the countries. Carbon-intensive energy companies' impact is measured by companies' annual market capitalization and data gathered from Companies Market Cap (2024) from 1996 to 2022. The timeline was determined based on the availability of the data. For the second independent variable data were gathered from the IEA World Energy Balances Highlights (IEA 2023*c*). The dependent variable is the energy transition, and it is measured by the annual carbon emissions of countries. Data were collected from Our World in Data (2024*b*). There are several control variables to test the relationship between the dependent variable and independent variables accurately. The aim is to test the hypothesis' reliability regarding the impact of energy companies and fossil fuel production on energy transition by eliminating factors that could affect the outcome.

The first control variable is population growth and data were collected from the World Bank (World Bank 2021). Population is a significant determinant in countries' energy consumption. Therefore, population growth was added as a control variable. The dataset includes the annual population changes of countries. Another control variable is executive constraints. If a political system is unable to implement a policy regarding energy politics, or if there are constraints on the executive, the government would be incapable of implementing the policy. That is why, constraints on the executive from Our World in Data (2024*a*) were added as a control variable. The data code countries from 1 to 10. 1 indicates that the executive has no restrictions in implementing a decision while 10 indicates significant restrictions on the executive. Another control variable is oil prices. Significant changes in oil prices affect countries' decisions toward green politics. While rapid increases in oil prices encourage countries to find alternative energy resources, sharp declines can increase consumption. That is why, oil prices from Our World in Data (2024*c*) were added as a control variable.

Countries' energy-related patents were included as a control variable. The data were obtained from the IEA (2024*d*) dataset. Since technology is a crucial component in energy transition, energy-related patents were included in the dataset in order to eliminate its influence. Another significant component is energy dependency and to measure countries' fossil fuel dependency import rates were considered. Data are from the IEA World Energy Balances Highlights (2023*c*). Since lots of countries are unwilling to realize their energy transition due to their over-dependency on fossil fuels, it is important to consider it as a control variable. Environmental protection is another control variable and data are from International Monetary Fund (2023). Data on government expenditures were obtained for specified activities including pollution abatement, protection of biodiversity landscape, and waste and wastew-

Figure 5.1 Electoral Democracy Indexes by Country (2024)



ater management. Weather conditions are a crucial factor in the energy transition towards renewables. For instance, climate conditions are necessary for wind power. Therefore, the Weather for Energy Tracker (2024*b*) dataset from the IEA was added as a control variable. R&D activities were added as a control variable to measure the hypothesis accurately, and the data were collected from the OECD (2024*a*). Another OECD dataset is the annual GDP (2024*b*) which was added to control the economic activities of countries. Finally, environmental agreement ratification was added from the International Environmental Agreement Database by Mitchell (2024). The Montreal Protocol from 1987, the UNFCCC from 1992, the Kyoto Protocol from 1997, and the Paris Agreement from 2015 were considered in countries' ratification processes. In the dataset, 0 equals "not ratified", and 1 equals "ratified" based on whether selected countries ratified these four agreements.

There are 23 countries, and these countries were selected according to their electoral democracy index from the V-Dem dataset (2024), and only countries of 0.80 and above were considered, rated on a scale from 0 to 1. The reason for the electoral

democracy is that elections matter in terms of determining domestic politics. Actors shape the outcome together and democracy allows them to restrict the government's actions through elections. There were two more countries which are Lithuania and the Slovak Republic, however, these countries were dropped due to their absence in the global energy market. Therefore, the data are time-series and cross-sectional, and 23 countries are selected for the measurement between the years 1996 and 2022. According to the figure, Denmark has the highest democracy score at 0.92, while Japan has the lowest at 0.82. Figure 5.1 above illustrates the countries and their electoral democracy indexes.

To test the hypothesis interactive ordinary least-square (OLS) regression model was conducted. OLS regression is suitable for the research because the study investigates the impact of carbon-intensive energy companies on the energy transition. Table 2 below illustrates the descriptive statistics of variables and shows the mean, standard deviation, minimum and maximum values, and the observation number. The high standard deviation in fossil fuel production indicates a wide range in distribution, which means there are both fossil fuel-dependent and not-dependent countries in the dataset.

Table 5.1 Summary Statistics of the Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Country	621	12.00	6.64	1	23
Year	621	2009.00	7.80	1996	2022
Dependency Imports	621	4.51e+03	7.08e+03	5.75e+01	7.97e+04
Fossil Fuels Production	621	4.94e+03	1.27e+04	0	7.99e+04
Weather Conditions	621	2.97e+02	3.04e+02	1.00e-02	1.01e+03
RD	621	1.95	0.88	0.31	6.00
Executive Constraints	621	7.97	25.30	4	7
Oil Price	621	4.75e+02	2.70e+03	7.998e+01	6.76e+04
Total Patent	621	7.41e+03	1.75e+04	0	8.92e+04
Population Growth	621	6.50e-01	5.90e-01	-1.85	6.72
Environmental Protection	621	89.605	380.7	1.69	177.52
GDP	621	6.44e+09	1.27e+11	1.08e+07	3.16e+12
Total Company Market Cap	621	1.20e+11	3.45e+11	1.01e+13	3.63e+12
Electoral Democracy	621	0.88	0.03	0.82	1
EAR	621	0.70	0.46	0	1
Carbon Emissions	621	2.78e+06	6.38e+06	6.62e+04	3.48e+07

When examining the maximum and minimum values of the total market company capitalization, it is evident that there is a significant difference. This is primarily due to the inclusion of large-scale energy companies like Exxon Mobil in the US alongside relatively smaller mining companies like Sabre Resources in Australia. The wide range in the standard deviation can be explained by this diversity. Another notable

aspect is the low average value of environmental protection. However, the standard deviation is also broad, which indicates that some countries have high values in environmental protection. Therefore, similar to many other variables, there are significant differences among countries in their environmental protection strategies.

One of the significant observations is environmental agreement ratification. The average is 0.70 and the standard deviation is 0.46 which means although the majority of countries have ratified the environmental agreements, however, there is also a high standard deviation in carbon emissions among countries. This indicates that there is a wide range of carbon emissions among cases, and not all countries implement the requirements of ratified agreements. This means that even though countries sign the IEAs and make certain commitments, it does not mean that these decisions will have a direct impact on carbon reduction. Overall, there is a wide variation among the values in the table. This is due to the diversity of economic, environmental, and demographic factors across countries and the years considered.

5.3 Empirical Results and Analyses

In the OLS regression analysis, the first of the four models examines the effect of companies' market cap on fossil fuel production. Control variables considered are Environmental Agreement Ratification (EAR), GDP, Environmental Protection, Population Growth, Total Patents, Oil Price, Executive Constraints, R&D, Weather Conditions, and energy dependence. In the second model, the effect of carbon emissions on fossil fuel production is analyzed. In this model, companies' market cap is not included in the regression analysis. In the third model, electoral democracy is added as an interactive variable with companies' market cap, creating a separate interaction term. At this stage, carbon emissions and electoral democracy are not included in the regression. Finally, in the fourth model, companies' market cap, carbon emissions, and the interactive variable of electoral democracy are included in the regression.

According to the results, in the first model, there is a positive relationship between companies' market capitalization and fossil fuels production. This means an increase in company market cap contributes to higher carbon emissions. As the economic power of companies increases, fossil fuel production also rises. In the second model, the impact of carbon emissions on fossil fuels production is examined. The reason for including the carbon emissions variable as an independent variable in this analysis is the assumption that it has a direct effect on fossil fuel production.

Table 5.2 OLS Regression Analysis on Fossil Fuels Production

	Fossil Fuels Production			
	(1)	**(2)**	**(3)**	**(4)**
Total Company Market Cap	1.451**		0.411***	0.402***
	(0.350)		(0.120)	(0.005)
Carbon Emissions		0.011		0.035**
		(0.022)		(0.018)
Electoral Democracy			1.242*	1.007***
			(1.003)	(0.032)
Interaction			0.345***	0.002***
			(0.003)	(0.008)
EAR	62.30	61.78	64.66	54.01
	(53.48)	(50.06)	(42.79)	(69.56)
GDP	1.078	1.642	1.853	1.295
	(7.579)	(6.498)	(7.007)	(9.357)
Environmental Protection	1.746	1.894	0.304	1.002
	(1.144)	(1.052)	(0.003)	(0.568)
Population Growth	58.66**	67.06**	49.73*	51.82*
	(24.76)	(19.89)	(20.04)	(18.43)
Total Patent	-0.054**	-0.0451*	-0.001	-0.041**
	(0.042)	(0.002)	(0.072)	(0.010)
Oil Price	-0.579	-0.235	-0.751	-0.818
	(0.050)	(0.024)	(0.174)	(0.191)
Executive Constraints	-547.8**	-468.9**	-502.04**	-309.6**
	(101.8)	(157.4)	(135.9)	(112.5)
R&D	103.6**	114.89**	85.04**	94.7**
	(33.03)	(18.56)	(57.49)	(11.98)
Weather Conditions	-0.469**	-0.684**	-0.248**	-0.275**
	(0.111)	(1.016)	(0.748)	(0.375)
Dependency (Imports)	-0.005	-0.014	-0.134	-0.123
	(0.013)	(0.157)	(0.234)	(0.312)
Constant	1.104**	1.356**	1.524**	1.491**
	(9.39)	(5.73)	(0.87)	(11.05)
Observations	620	620	620	620

Although a positive relationship is observed in the results, the outcome is not statistically significant. This indicates that carbon emissions do not have a significant

impact on fossil fuel production, contrary to expectations. Therefore, the second independent variable is not sufficient to explain the model, and fossil fuel production alone is not enough to explain the estimates. One of the possible reasons for this might be differences in energy usage. While some countries tend to produce fossil fuels and export them, some of them also consume what is produced. Therefore, how fossil resources are utilized is highly important. For example, while Australia is the world's second-largest exporter of coal, data on domestic energy consumption show that coal is not consumed as much as oil or natural gas within the country. Even though Australia uses coal as an energy source, it exports coal to other countries in a way that does not significantly impact carbon emissions domestically. Consequently, coal remains an important energy source, but its impact on carbon emissions is relatively low. This could be a way to interpret the results of the second model. However, the second independent model needs additional measurements and explanations.

In Model 3, a positive and statistically significant relationship is observed. The interaction variable of Electoral Democracy increases the effect of companies' market capitalization on fossil fuel production. Democracy, which involves various interest groups, has a positive impact on market capitalization. This is due to democracies providing interest groups with the opportunity to represent themselves. However, this does not always translate into a positive environmental outcome. Therefore, compared to Model 1, it is seen that the interaction variable enhances the effect of total company market capitalization on fossil fuels production. In the final model, companies' market capitalization, carbon emissions, and the interaction variable are considered together. Unlike in the second model, when companies' market capitalization and the interaction variable are considered together, the effect of carbon emissions on fossil fuel production has increased.

5.4 Discussion and Conclusion

Results indicate that the existence of powerful energy companies constitutes a restriction against shifting a country's energy system towards a green future and reducing carbon emissions. The more carbon-intensive energy companies a country has, the harder it is to realize this transition due to the difficulty in convincing these domestic veto players. Thus, the variations in energy transition among democracies depend on the country's company number. This also shows the counterfactuality in energy politics. The energy transition differs from the interests of domestic actors,

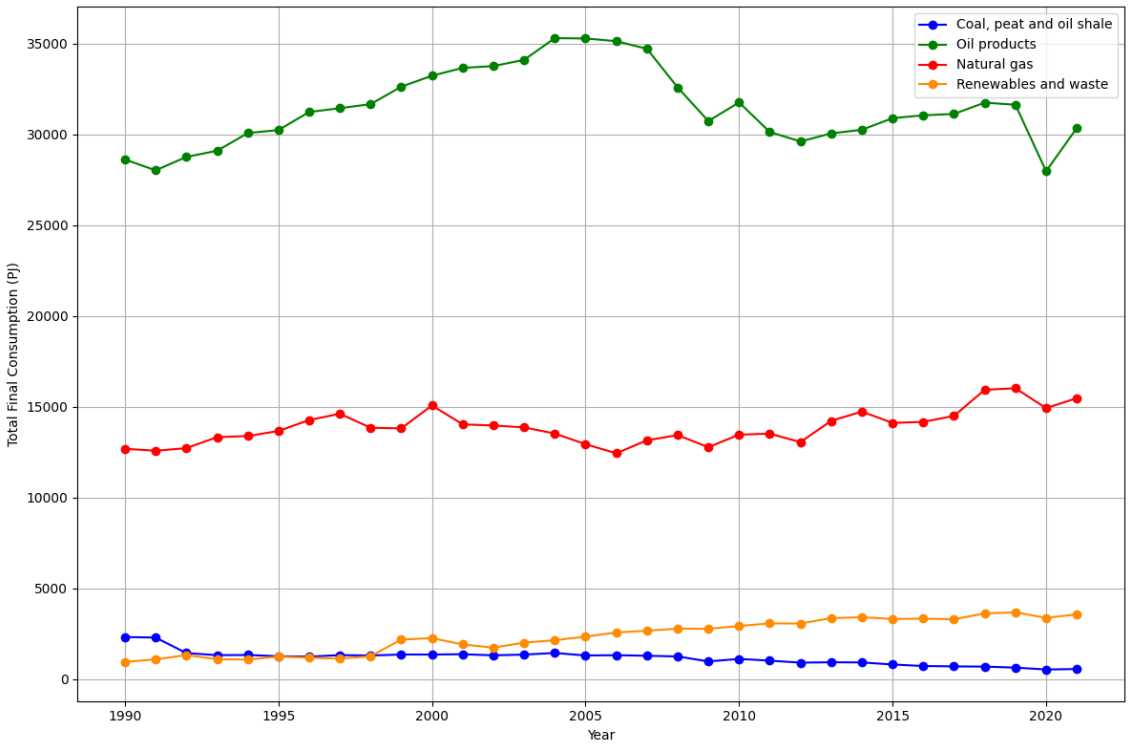
and their positions. Thus, there is no linear path for countries. The following examples are selected from both pluralist and corporatist countries. This approach aims to understand the extent of the veto power of interest groups in the system and to address selection bias. In this regard, the first example is the American pluralist system, which is a classic case of pressure politics.

United States

One of the significant examples of this is the US case. The complex relations and power of energy companies made them veto players in the decision-making process and this critical juncture creates path dependency for the country. Since the country established its energy system based on non-renewables it is costly to implement renewable politics and the influence of veto players prevents the country from being a carbon-zero emitter. Of course, the existence of these companies is not the only reason behind the failure, however, the intricate relations between the government and industry stand out as a significant factor in shaping this outcome. The opposition of energy companies is not only effective in realizing this transition but also in the adaptation and implementation processes of IEAs. For instance, the country withdrew from both the Kyoto Protocol and the Paris Agreement. On November 12, 1998, US President Bill Clinton signed the Protocol, however, Congress never ratified the agreement which means the US never officially ratified the Protocol (Müller n.d.). Additionally, on April 27, 2001, the US Environmental Protection Agency announced that the US would withdraw from the Kyoto Protocol under the Bush administration and would not implement the conditions. It was worth noting that, at that time the head of the EU Commission Romano Prodi explained this situation by saying "If one wants to be a world leader, one must know how to look after the entire earth and not only American Industry" (Phillipson 2001). More importantly, according to the Protocol, it needed to be ratified by countries responsible for 55% of carbon emissions to enter into force, which means that the refusal of the US to ratify it pressured other high carbon emitter countries to meet this threshold and ratify it (EC 2022*b*). However, the US was the highest carbon emitter at that time, and this decision led other countries to hesitate to take responsibility without the US.

As a result, countries like Australia, Canada, Russia, and Japan started to object to ratifying the Protocol. The reasons for the US were the lack of developing countries, questionable science, and the Protocol's negative impact on the economy (Phillipson 2001). Later, on June 1, 2017, US President Donald Trump declared the withdrawal of the US from the Paris Agreement. The reason was "the unfair economic burden imposed on American workers, businesses, and taxpayers" under

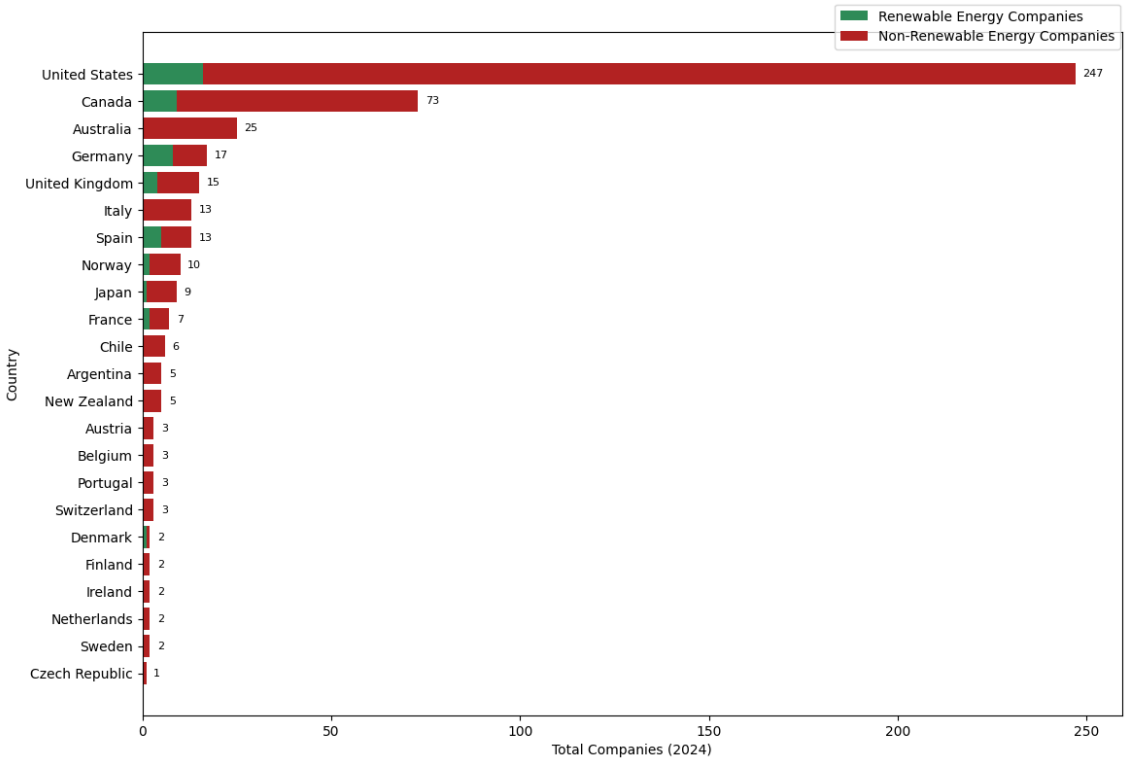
Figure 5.2 The Energy Consumption of the United States (1990-2021)



the Paris Agreement (Pompeo 2019). Both withdrawals illustrate the importance of domestic-foreign linkages, highlighting how industries function as veto players and constrain decision-makers. Another crucial event was held during the Climate Convention in 1992 when the US was highly criticized by other industrialized countries for blocking the approval of the binding target to stabilize emissions at 1990s levels (Agrawala and Andresen 2001). These results are mostly related to decision-makers' inability to convince domestic actors, particularly carbon-intensive energy sectors, and their reluctance toward green transition, rather than ideological differences or incapabilities. Because of the constraints imposed by the domestic interest groups, the US hesitates to ratify and implement IEAs.

As seen in Figure 5.3, there is a slight increase in oil consumption in the US over the years which only decreased during the 2008 economic crisis and the COVİD-19 pandemic in 2019. One important determinant in the increase in fossil fuel consumption is due to the Shale Revolution. The increase in oil and gas production in the US, driven by horizontal drilling and supporting policies, has increased the country's dependency on fossil fuels (Blackwill and O'Sullivan 2014). Overall, the 1973 OPEC crisis affected lots of countries in different ways. Some of them shifted their energy system and economies into a more independent than the previous versions, some countries did not implement a comprehensive transformation. Even though, the US

Figure 5.3 The Number of Energy Companies by Country (2024)



was one of the countries that was highly affected by this crisis, the impacts of it remained short and a significant shift in the energy system did not happen in the US. In fact, the failure of the US was not because of the lack of innovation, financial burdens, technological difficulties, or the incapability of realizing this transition. It was because of the existence of a large number of carbon-intensive energy companies, and consolidated sectors. As Solomon & Krishna (2011) argue, there was disagreement regarding alternative energy resources, high competition among interest groups, and the disability to adapt to new policy regulations and path dependence. All in all, these results are not surprising when considering a large number of energy-related companies in the US. Figure 5.4 below effectively illustrates the difference between the US and other democracies in terms of the companies they have and explains why the US chooses to be a free rider while implementing environmental policies.

Figure 5.4 below illustrates the total energy companies of the countries according to their market capitalization. As can be seen, the US has the highest number of companies which is 247 and only 34 of them are renewable energy companies. Even compared with the second-highest country, Canada, there is a significant gap in terms of the total company they have. Canada has 73 energy companies in the world market, 9 of them are renewable-based companies, and Australia and Germany

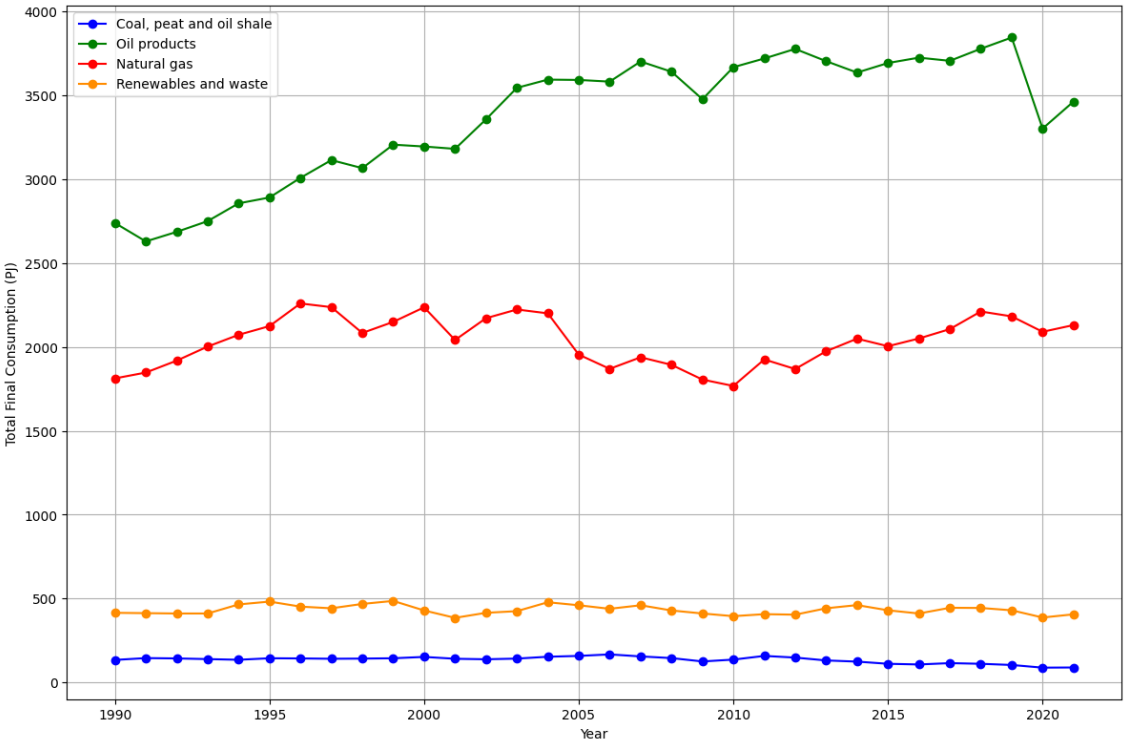
follow Canada as third and fourth countries with 25 and 17 companies respectively. None of the Australian companies are renewable, and this number is 8 in Germany. The crucial factor here is there is a correlation between the unwillingness of countries to realize the energy transition and the carbon-intensive energy companies in their countries. When countries have more companies in the international energy market, they become reluctant regarding carbon reduction. Countries with a higher number of energy companies, particularly, carbon-intensive ones, face difficulties in achieving an energy transition. This is not only because of the lobbying power of energy companies but also the economic, political, and social influence capacity of these companies. Once the carbon-intensive energy sector is consolidated within a country, the interaction between industries, the employment they provide, and the interdependency of different sectors increase, and the costs of carbon reduction get bigger.

On the other hand, countries like Sweden, Denmark, Finland, and Switzerland have prevented carbon-intensive energy companies from dominating the sector by emphasizing diversification in their energy sources and making the necessary decisions for green transition long before. That is why, these countries are the most successful countries in terms of carbon reduction according to the Energy Transition Index (World Economic Forum 2024). As seen, these countries have a low number of companies compared to others. On the other hand, countries like Canada still hesitate to take action for green policies. For instance, Canada was the first country that withdraw from the Kyoto Protocol on 11 December 2011 (UNFCCC n.d.). The reasons behind this decision were the withdrawal of the US, the change in government, and increasing costs in the realization of this process (Fjellvang 2015). Additionally, in contrast to Brazil, Denmark, or France during the 1970s crises, there were no significant energy shifts either in the US or in Canada. The reasons for the failure in the US case are examined above.

Canada

Canada was one of the Western countries subjected to the OPEC boycott at that time and was highly affected by the rising oil prices. However, such an energy transition did not occur in Canada. This was primarily because of the existence of a consolidated energy system that mostly relies on carbon-intensive industries. One of the significant reasons for the different paths after the OPEC crisis was the difference in dependency between countries. For instance, both Brazil and Canada were dependent on fossil fuels, however, while Brazil was dependent on imported oil Canada needed fossil fuels for the continuity of the domestic industries. Even though the country aims to reduce its greenhouse gas emission by 40-45% by 2005

Figure 5.4 The Energy Consumption of Canada (1990-2021)



levels by 2030 and to become a net zero emitter by 2050 (IEA n.d.*d*) there are significant challenges for Canada in achieving its environmental targets considering the country is a fossil fuels producer, consumer, and exporter.

The national capabilities and circumstances prevent Canada from taking action for green targets. Currently, Canada's total energy supply consists of 40.3% natural gas, 32.9% oil, 11.5% hydro, and 7.6% nuclear. Although renewables form 68.6% of the share of power generation and coal production decreased by 28% between 2000 and 2022, crude oil production increased by 123%, and natural gas production increased by 16% since 2000 (IEA 2023). The energy consumption pattern of the country can be seen in Figure 5.5 below. Except for 2019 which was the year of widespread economic recessions and shortages in energy supply due to the COVID-19 pandemic, the country increased its oil consumption year by year. Together with the US and Canada, Japan constitutes a good illustration of the difficulty of convincing domestic interest groups in shifting energy systems.

Japan

The whole process of the Kyoto Protocol is a significant example of how Japan failed to agree upon a climate target and carbon reduction. In fact, the reason that Japan signed the first period of the Kyoto Protocol was that Japan was the host country.

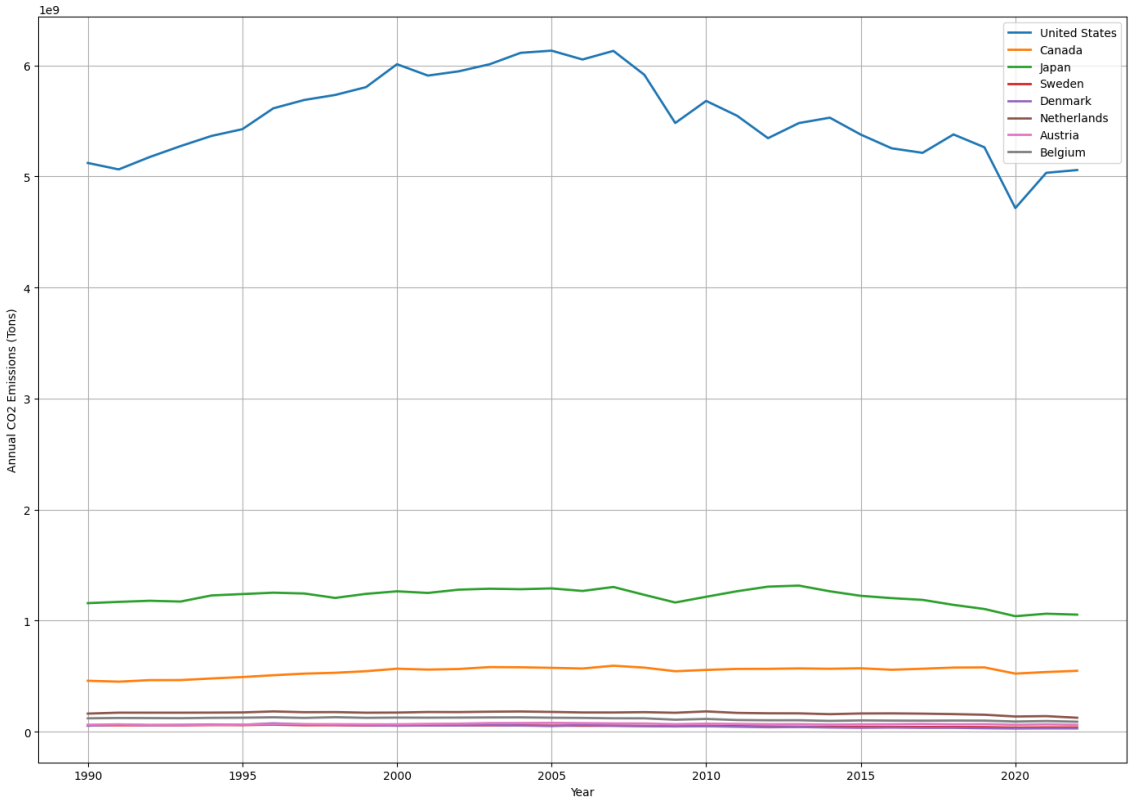
The country insisted the hosting COP 3 meetings in Kyoto, however, for a long time during the negotiations Japan could not submit a proposal due to the disagreements between domestic interest groups. Diverse interests prevented Japan from agreeing on and offering a concrete environmental target until the Prime Minister's Office intervened in the negotiation process. The result was a 5% reduction. One of the conditions for Japan was the inclusion of the US. Otherwise, the costs of the other countries that are obliged by the Protocol would increase. At the end of the COP 3 meeting, Japan committed to reducing its carbon emissions by 6% by the 1990 levels in the five-year period from 2008 to 2012, and the US agreed to sign the Protocol.

Consequently, the Kyoto Protocol became the first multilateral environmental agreement that Japan adopted and the negotiation process showed the significance of domestic actors (Kameyama 2004). The conflict between the decision-makers and stakeholders prevented Japan from adopting the second round of the Kyoto Protocol (Doha Amendment) between 2013 and 2020. Thus, Japan became the third country after Canada and Russia that withdraw from the Kyoto Protocol in 2013 (Ziobro 2013). The country did not sign the extended version in the second period. According to the Vice Minister for Global Environmental Affairs Hideki Minamikawa, the reason for the withdrawal was the second phase of the Kyoto Protocol only addresses 27% of global pollution, and the biggest emitters like China and the US were out of this target (Dutta 2015). There were strong reservations from other carbon-intense countries like Canada and Australia as well due to the possibility of implementing the requirements imposed by the Protocol for the second round.

As a result, Japan declared its reservations to ratify the second period of the Kyoto Protocol and then became the third country that withdrew from it. As of November 2016, Japan has ratified the Paris Agreement and accepted the requirements to tackle the climate crisis (UNFCCC n.d.). The country aims to reduce its carbon emissions by 26% by 2030 compared to 2013 and reduce its greenhouse gas emissions by 80% by 2050. However, this is the lowest target among industrialized countries and far from the targets required by the Paris Agreement (Matsushita 2024). In the appendix, there can be seen the energy consumption of the country for the last 30 years and has seen, there have been no significant changes in Japan's carbon reduction for the last 30 years.

The only actor not committing to carbon reduction is not the Japanese government. Japanese companies also tend to fulfill their carbon reduction and net zero commitments only after facing public pressure. The Government of Japan and companies such as Sumitomo Corporation had to cease their investment in a large coal power plant in Matarbari, Bangladesh. This decision followed the suspension of Official

Figure 5.5 The Annual CO2 Emissions by Country (1990-2022)



Development Assistance, which was influenced by both shareholder pressure and advocacy from Bangladeshi and international environmental organizations. Also, cities like Kyoto and Kobe have taken a stand against one of Japan's largest electricity companies, KEPCO. More than 36% of shareholders have supported increased transparency and more decisive action to meet net zero and climate commitments (Benefield 2023). Investors, climate activists, and international organizations are insisting that Japanese companies show how their business strategies align with the Paris Agreement.

Figure 5.6 above indicates the annual carbon emissions of eight countries from 1990 to 2022. Selected countries are the US, Canada, Japan, Sweden, Denmark, Austria, Belgium, and the Netherlands. These examples were selected consciously in order to illustrate the variations in the difficulty of reducing CO2 emissions. Countries like Sweden, for instance, might reduce their carbon emissions more easily than the US because of the differentiated historical paths they follow. On the other hand, because of the high level of carbon levels, the US might avoid taking action against fossil fuels. Therefore, the historical events examined above fit into this situation. Although not as much as the US, Canada, and Japan's high carbon emissions indicate the reason

for their hesitations in IEAs and implementing environmental regulations.

Austria

Austria is a classic example of a corporatist system, where interest groups negotiate for a social contract. In countries like the Netherlands and Austria, there is increasing collaboration between the government and groups in the formulation and implementation of public policies compared to other Western democracies (Wilson 1983). The country has committed to achieving climate neutrality by 2040. Currently, over three-quarters of its electricity is generated from renewable sources, with a target of reaching 100% renewable electricity by 2030. Although the total energy supply includes 35.4% oil and 22.3% natural gas, biofuels, and waste are the third-largest energy sources, accounting for 20.9%. Between 2000 and 2022, the country's energy intensity has decreased by 20%, while electricity consumption per capita has risen by 17% since 2000. Additionally, renewable energy sources now make up 72.7% of the electricity generation mix. Within this, biofuels and waste contribute 55.4%, hydro-solar 25.7%, and wind and solar energy 9.9%, respectively (IEA n.d.*b*). Austria's success is driven by its investment in renewable energy. Investing in renewable energy sources such as solar, wind, and biomass, creating jobs in these areas, and directing businesses towards these sectors effectively mitigates serious opposition to the energy transition.

Today, Austria's energy policy is integrated within a federal government framework, characterized by a corporatist culture, multiple political parties, and an expanding network of interest and advocacy groups (Wenz 2022). This situation not only prevents a single actor from dominating but also mitigates the risk of energy policies being dominated by any actor, and reduces the likelihood of path dependency. This situation is also visible in Figure 5.3. In the international market, Austria's number of carbon-intensive energy companies is limited to two. When these actors do not dominate the system, it both facilitates investment and incentives for other energy sources and significantly reduces the constraints encountered in transitioning to alternative energy sources.

Belgium

Belgium's energy strategy aims to shift towards a low-carbon economy while maintaining energy security, reducing consumer costs, and enhancing market competition. The country has made significant improvements towards these objectives, particularly standing out as a global leader in offshore wind energy. Since 2000, the country has succeeded in reducing carbon emissions by 24% and has also cut the energy intensity of its economy by 38%. Notably, Belgium's energy production consists of

71.6% nuclear energy and 17.6% biofuels and waste. The proportion of natural gas production is just 0.1% (IEA n.d.*c*)

Investments in renewable energy and support for related initiatives are significant factors in Belgium. Additionally, Belgian energy companies are aware of the unsustainable conditions created by the climate crisis and are supporting this transition. For example, former European Investment Bank (EIB) Vice-President Kris Peeters stated that in 2023, nearly 80% of the EIB's investments in Belgium were climate-related, setting a record. This demonstrates that green investment is not only crucial for mitigating the effects of climate change but has also become economically viable. According to a survey, 64% of Belgian firms reported that weather events had impacted their businesses, and 54% of Belgian companies have taken measures to build resilience against such risks (EIB 2024). Therefore, when policymakers provide the necessary incentives and funding for the transition, companies are more willing to engage in the process.

Denmark

As seen above, Sweden, Denmark, and the Netherlands have fewer carbon emissions compared to the US, Japan, and Canada and the reason for this mostly relies on the path they choose to follow. One of the crucial factors in Denmark's success in green transition is the early adoption of renewables. The country adopted wind tribunes right after the 1973 OPEC crisis and invested in renewable energy. The 1970s energy crises were a critical juncture for Denmark just like many other Western countries, however, the decisions taken at that time prevented the country from being dependent on fossil fuels. From the late 1970s to the 2000s, six thousand wind turbines were constructed. During the 1980s twenty companies that produced wind turbines were founded. In 1991, the initial offshore wind farm was established, which has been dismantled then. Wind power is the cheapest energy source in the country, and in total, there are 4.800 turbines, and 33,000 people are working in the operation process. Denmark aims to construct the first artificial island to distribute renewable energy in the North Sea. Additionally, the country aims to meet 60% of its energy needs from wind power by 2030 (Obadia 2024). Therefore, there are lots of other sectors and industries that survive without fossil fuels.

As shown in Figure 5.4, Denmark has only two energy companies in the world's largest energy companies index, and one of them is a renewable energy energy company. Unlike the US, Denmark does not have many carbon-intensive energy companies, which results in fewer opponents when implementing its energy transition and carbon-neutral policies. Denmark's willingness to realize the green transition, despite having relatively low carbon emissions compared to other industrialized coun-

tries, is explained by Dan Jørgensen, Denmark's Minister for Climate, Energy, and Utilities: "Because we want to be a frontrunner; we want to show the world that you can have a decarbonized economy that is wealthy and provides its people with a high quality of life" (Yale School of the Environment 2021). Denmark is a good illustration of the importance of effective policymaking. The country has set a path that prioritizes not only the future of industry but also nature and the well-being of its citizens. As a result, Denmark is one of the leading nations in the energy transition, due to its historical decisions.

Sweden

The same applies to Sweden and the Netherlands. These countries have also two globally carbon-intense energy companies. Sweden, for instance, was the first country in the world that pass an environmental law in 1967. The country hosted the UN conference on the environment in 1972, later this conference led to the creation of the United Nations Environment Programme (UNEP). Furthermore, Sweden was the first country that adopt a carbon tax in the world in order to reduce the dependence on fossil fuels in 1995. As of 2022, around 60% of Sweden's energy supply comes from renewable energy sources. The country aims to convert its transportation sector to fossil-free by 2030 and become climate-neutral by 2045 (Institute 2024).

According to 2022 data, the share of renewables in power generation in Sweden is 66.9%. Additionally, since 2000, the energy intensity of the economy has decreased by 40%. In terms of energy production, Sweden's sources are as follows: 38.1% nuclear energy, 34.9% biofuels and waste, 17% hydro, 9.9% wind and solar, and lastly, 0.1% coal (IEA n.d.*j*). Therefore, the country is both diversifying its energy sources to avoid reliance on a single energy source and shifting towards low-carbon emission sources. As shown in Figure 5.3, Sweden has only two carbon-intensive energy companies in the global market and does not tie its economy to carbon-intensive sectors. This not only makes Sweden a global leader in the energy transition but also reduces the constraints it faces in making environmentally friendly decisions.

The Netherlands

Another prominent example is the Netherlands. The country has managed to reduce its energy-related carbon emissions by 17% since 2000 (IEA n.d.*k*). The Netherlands aims to provide 16% renewable energy by 2030 and to become a carbon net zero emitter by 2050. This target was shaped by the government in the Energy Agreement for Sustainable Growth in 2013. The importance of this decision was that the environmental targets were shaped by the consensus of 40 different groups including

business associations, trade unions, and environmental organizations In March 2017, the energy-intensive industries signed the agreement and accepted the obligations required by the Agreement (Government of the Netherlands 2013). That is why, it is less likely to observe such a conflict of interest in the Netherlands compared to Japan due to the willingness of stakeholders. The government implies a transition approach adopted by the scientists based on insights from innovation and transition studies. Additionally, during the planning stage, the government contacted similar countries like the UK, Austria, Finland, and Denmark for collaboration (Kemp 2011). Because the Netherlands prioritizes the corporatist approach and inclusiveness of different sectors, academia, and practices, the energy transition plan is much more successful and possible to adopt the new system compared to other cases.

Overall, as results indicate the energy transition varies among democracies. The development of carbon-intensive energy markets and their influence on decision-making mechanisms are the main determinators of the outcome. If a country starts to shift its energy system into a cleaner and more independent one, the environmental targets are more likely to succeed. Sweden poses a significant example of this case. The country has followed a path to a cleaner energy system for almost fifty years. Related to this, the number of Swedish carbon-intense energy companies is fewer compared to other democracies. That is why, there is not much strong fossil fuels industry in Sweden, and when it comes to the implementation of a green policy, decision-makers do not face a strong opposition group/veto players.

On the other hand, in countries where fossil fuel industries are powerful, shifting the energy system towards a green future is less likely to happen. This is primarily because of the impact power of carbon-intense energy companies and sectors. In any attempt to reduce carbon emissions, the cost will be distributed to these companies. In order to prevent such a scenario, these veto players prefer to spoil the process and this can be seen in the US example. This is due to the strength of the carbon-intensive sectors, the US consistently shows reservations regarding energy transition and carbon reduction targets. This shows the counterfactuality among democracies in their energy transitions. If the wrong path has been followed, the carbon-intensive energy industry gets stronger and prevents alternative energy paths for the long term and this creates path dependency. On the contrary, if a country pursues energy diversity and avoids being over-dependent on a specific sector, it has more opportunities to achieve energy shifts.

6. CONCLUSION

Energy is one of the fundamental materials in modern human life. Since the discovery of fire, it impacted the history of civilization incredibly. Every transition in energy has affected societies politically, economically, and socially. One of the crucial examples of this situation is the Industrial Revolution. The transformation in energy usage has impacted human life, working conditions, mass migration, and many other issues. Since the Industrial Revolution, energy has affected our lives in terms of heating, housing, transportation, and communication. It also affects different components of politics like security, migration, climate change, foreign policy, and conflicts on limited resources. Therefore, the Revolution has become a critical juncture in terms of modern civilization's over-dependence on energy resources.

However, climate crisis-related problems are threatening modern systems, and the best way to address these issues is through an energy transition that can control the crisis. There are numerous historical examples of energy transitions, such as the shift from biomass to coal, then to fossil fuels and the subsequent rise of nuclear energy in the last century. For today, an energy transition means moving to energy sources that reduce carbon emissions and involving industries and stakeholders in this transformation. This approach aims to build a more sustainable and environmentally friendly system. However, this transition faces many challenges. Among the primary challenges are the heavy reliance of current energy systems on fossil fuel sources and the high cost of the transition.

It should also be noted that in international relations, the free rider problem is quite common when it comes to energy policies. The primary reason for this is that energy policies, energy dependencies, and energy use vary significantly from country to country. each country formulates its own energy policies. While cooperation is crucial for achieving an energy transition, the approaches countries take can differ significantly. Domestic factors, energy dependency, the types of energy resources available, and the strength of carbon-intensive sectors all play a role in shaping these energy processes. However, in energy systems lacking diversification and localiza-

tion, excessive dependence on external sources leads to significant energy security problems.

This problem was realized the most during the 1973 OPEC crisis and this crisis became a turning point for many countries in realizing their over-reliance on some energy resources, particularly fossil fuels, and decided to shift their energy system into a more diversified one. Countries like Brazil, France, and Denmark started their own initiatives on energy, and through this policy, they aimed to enhance a more sustainable and secure energy supply. The shortages in energy supply are not only a threat to the continuity of industries but also a security vulnerability. That is why, these countries shifted their energy systems in decades. On the other hand, some countries like the US did not change their energy system in the long term. However, the US was one of the first countries impacted by the OPEC crisis. Then, why the US did not shift its energy patterns?

To explain this situation, this thesis examines how carbon-intensive energy companies, acting as veto players, impact the decision-making processes involved in energy transitions. Where carbon-intensive energy sectors are well-established, the implementation of green policies is less probable compared to situations where these sectors are less consolidated, due to their greater capacity to sway decision-making. They function as a veto player and prevent the country from shifting its energy system into a new one. That is why, while Brazil, France, and Denmark were changing their energy system, the US remained more or less the same. Carbon-intensive companies impose restrictions on decision-making mechanisms and prevent energy transitions. Additionally, when looking at the energy trends of countries, it is observed that each country follows a specific path.

A crucial factor here is the difference between democracies and non-democracies. Even though there are interest groups in non-democracies, these cannot function as a veto player against the decision-makers due to the lack of a veto mechanism. In non-democracies, the leader, the head of the government decides on politics, and interest groups cannot oppose it. On the other hand, in democracies, interest groups are able to act as veto players and constrain the government. That is why, more actors are involved in the decision-making process in democracies and this makes the process more complex. In order to illustrate the situation, Australia and China are taken as case studies, and their energy politics are explained. These countries are quite similar to each other in terms of energy sources they have, economic conditions, and energy dependency except their political regime. While Australia is a democracy, China is not.

Thus, this differentiation affects their decisions on energy politics. Australia cannot

realize its energy transition due to the existence of powerful veto players in domestic politics which are consolidated carbon-intensive energy companies. On the other hand, when looking at China's energy trend for the last 30 years, there have been lots of ups and downs, especially, since the 2000s. At the beginning of 2000, China mostly relied on coal consumption in order to achieve its development program, however, since 2015, there has been a rapid decline in coal consumption, and coal has started to be replaced by nuclear power. This is primarily because of the lack of veto players. In the absence of such actors, decision-makers can easily implement politics in the short term. More importantly, when looking at the consumption patterns of countries for the last 30 years, while democracies are stable, there are lots of ups and downs in China's consumption pattern. In conclusion, while democracies cannot realize this energy transition due to the powerful carbon sector as veto players, non-democracies do not want to because of the material costs of this transition.

The subsequent chapter investigates the variations among democracies and the hypothesis tested regarding the impact of carbon-intensive energy companies and carbon emission on fossil fuel production. According to the results, there is a positive relationship between carbon-intensive energy companies and fossil fuel fuel production, and this relationship inreases when electoral democracy added as an interactive variable. This means when carbon-intensive energy companies' market cap increases fossil fuel productions of countries increase as well. On the other hand, there although there is a positive relationship between carbon emissions and fossil fuel production, results are not statistically significant. One of the possible reasons can be the different energy usage of countries. For instance, Australia is the second-largest coal exporter in the world, however, when looking at the energy consumption of the country, the coal is not that prominent. That is why, even though coal is a crucial resource for foreign trade, the impact of coal on carbon emissions in Australia is limited. The relationship between fossil fuel production and carbon emissions should be examined in detail in other studies. In the last model, both companies' market cap and carbon emissions are considered as independent variables and electoral democracy is included as an interactive variable. In the regression results, it is observed that there is an increase in the strength of the relationship.

In terms of limitations, the topic itself, energy politics, constitutes an important limitation. The dynamic of energy politics makes it difficult to generalize and keep up to date. Each energy transition is unique and there are variations among countries. Therefore, the examples provided in the study may lose their relevance after 10 years, however, it is hoped that the theoretical part will remain valid. Another limitation is data. The data can always be improved. A better dataset and research design can better explain the relationship between variables. The limitation in this thesis

was the availability of data from 1996 to 2022, but a study containing the 1970s, particularly, would better illustrate the relationship between energy companies and energy transition. This study asked what affects the decision-making process in energy transition and found energy companies. For further research, scholars should ask how energy companies affect the decision-making processes. I believe, studies will provide interesting results.

All in all, there is no single energy transition. There are variations of energy transition and each case should be studied in detail by political scientists. The energy transition is a multifaceted process requiring significant socio-technical changes, and politics plays a crucial role in shaping this transition and addressing climate change. The influence of political factors can either support or obstruct progress in the energy transition. Therefore, understanding the energy transition involves not just natural sciences but also a thorough exploration by political scientists. Even though fossil fuel energy companies play a significant veto role in the transition, as seen in Japan, the pressure from citizens, climate activists, and civil society organizations can compel these companies and policymakers to reconsider their decisions. In this context, citizens should have a greater influence on the decision-making process in energy policies, and the energy transition should advance alongside the concept of active citizenship.

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APPENDIX A

Figure A.1 Energy Consumption of Brazil (1990-2022)

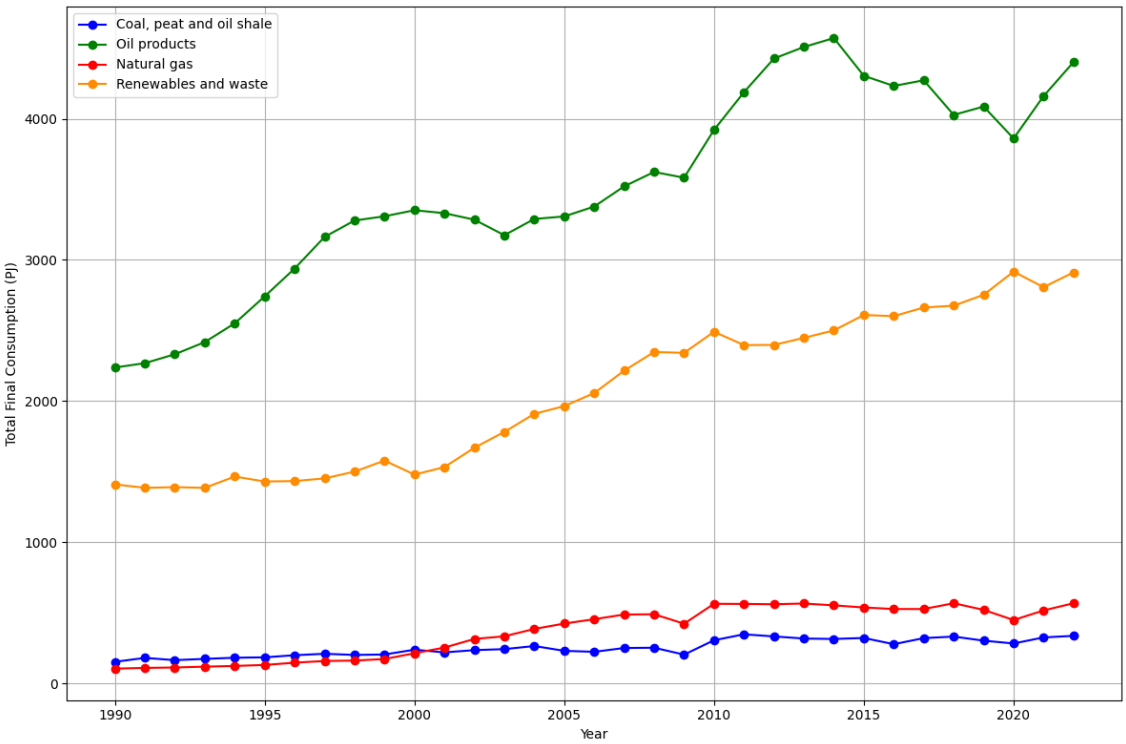


Figure A.2 Energy Consumption of Denmark (1990-2021)

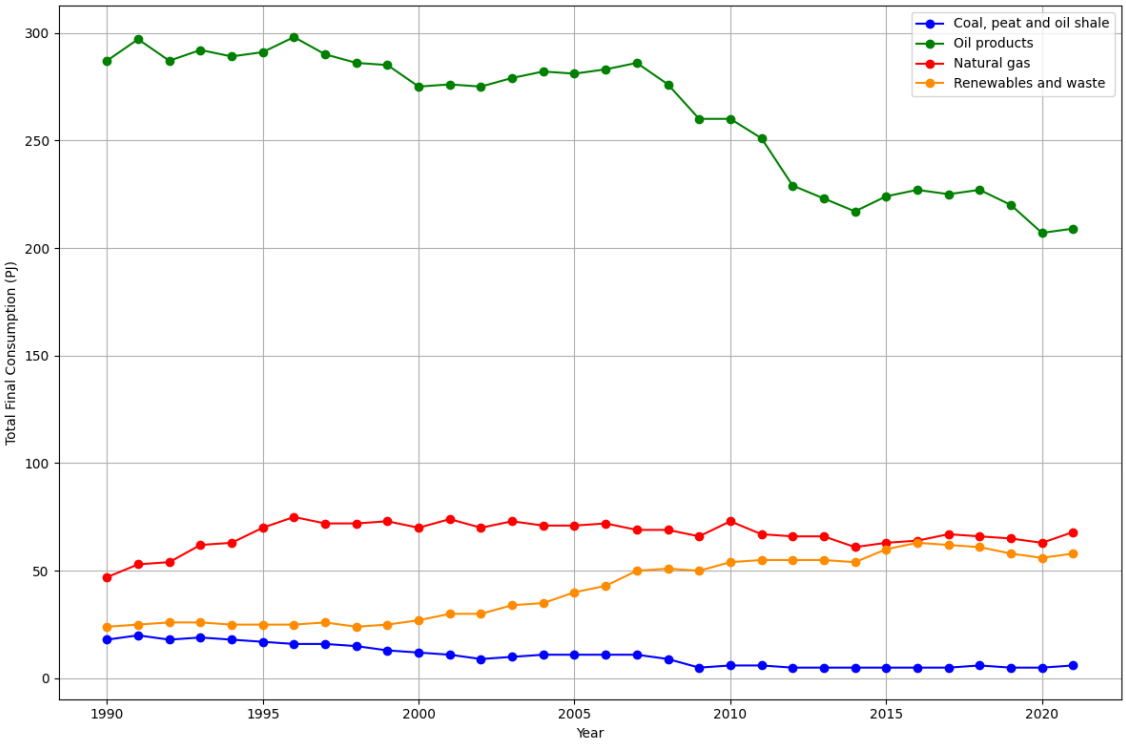


Figure A.3 Energy Consumption of France (1990-2022)

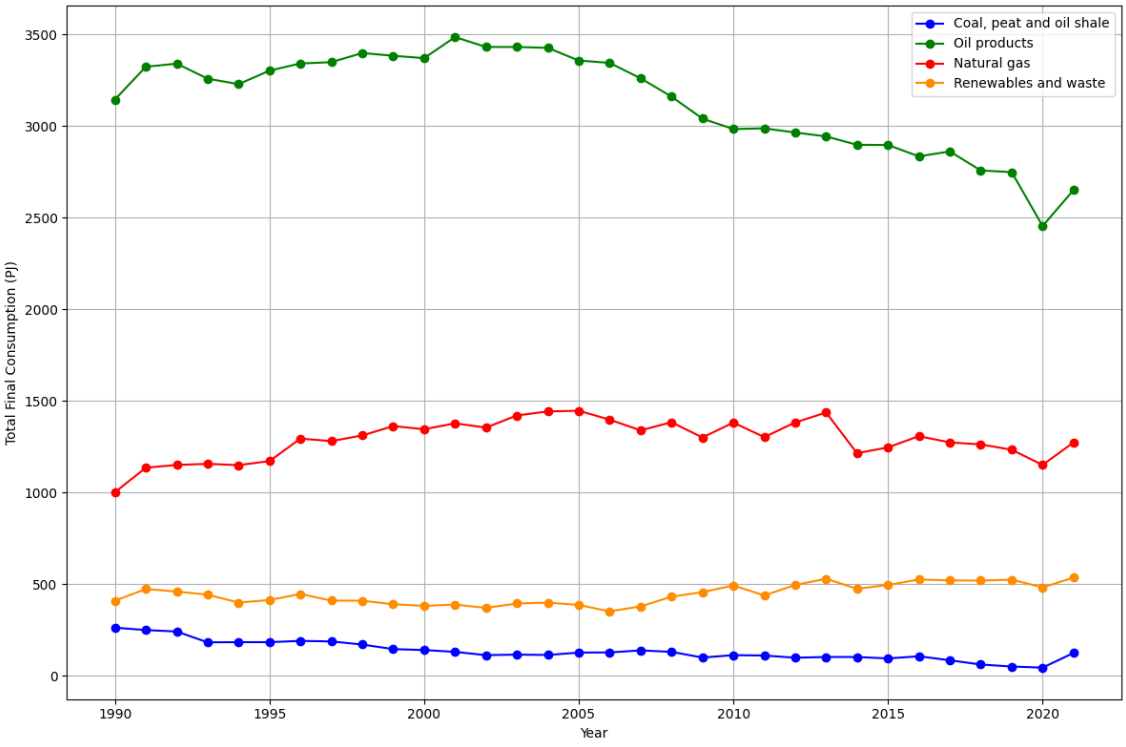


Figure A.4 Energy Consumption of Germany (1990-2021)

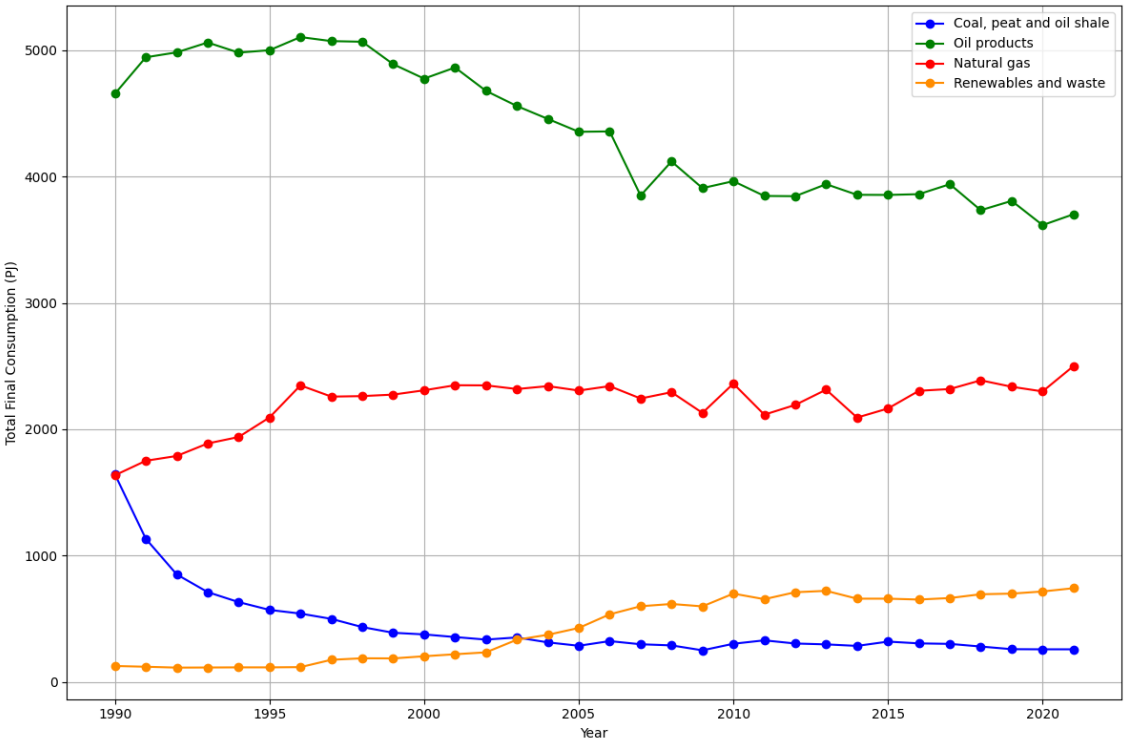
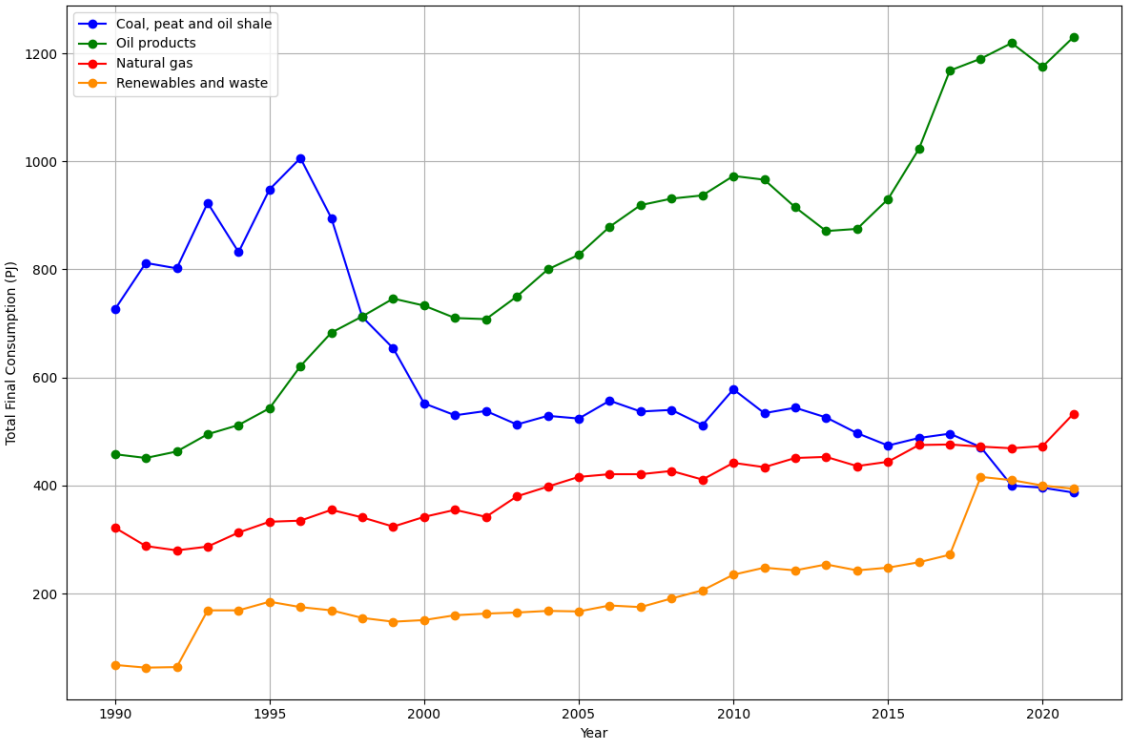


Figure A.5 Energy Consumption of Poland (1990-2021)



APPENDIX B

Figure B.1 Energy Consumption of Austria (1990-2021)

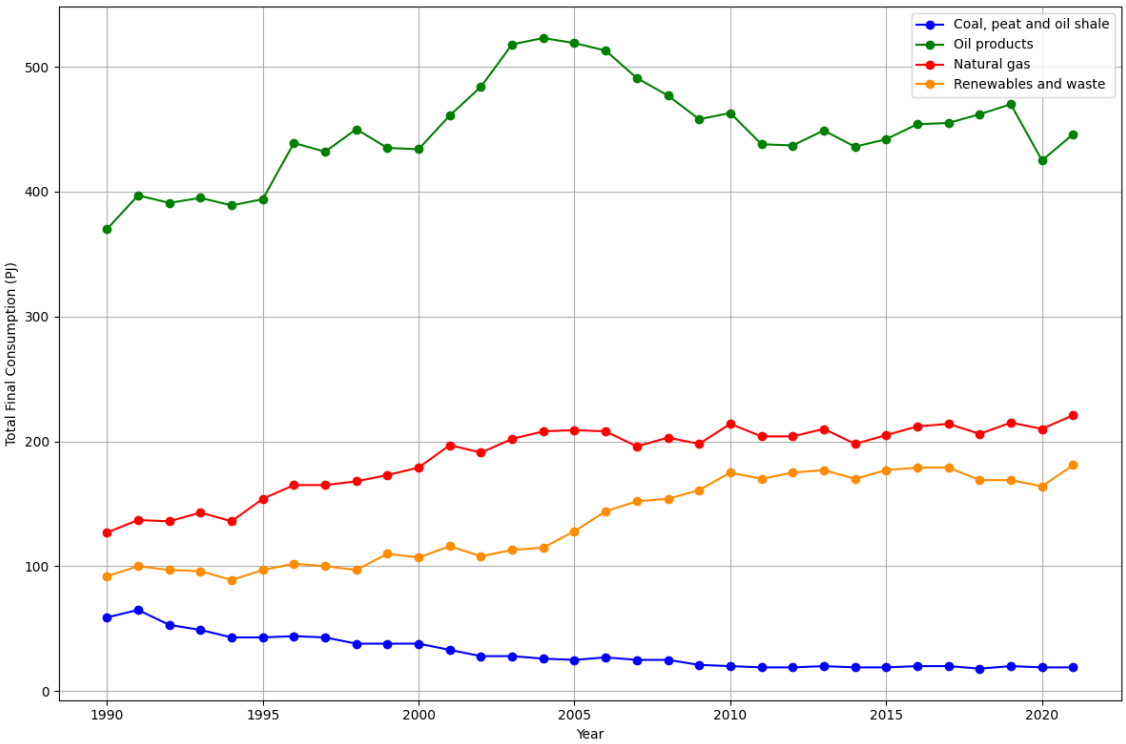


Figure B.2 Energy Consumption of Belgium (1990-2021)

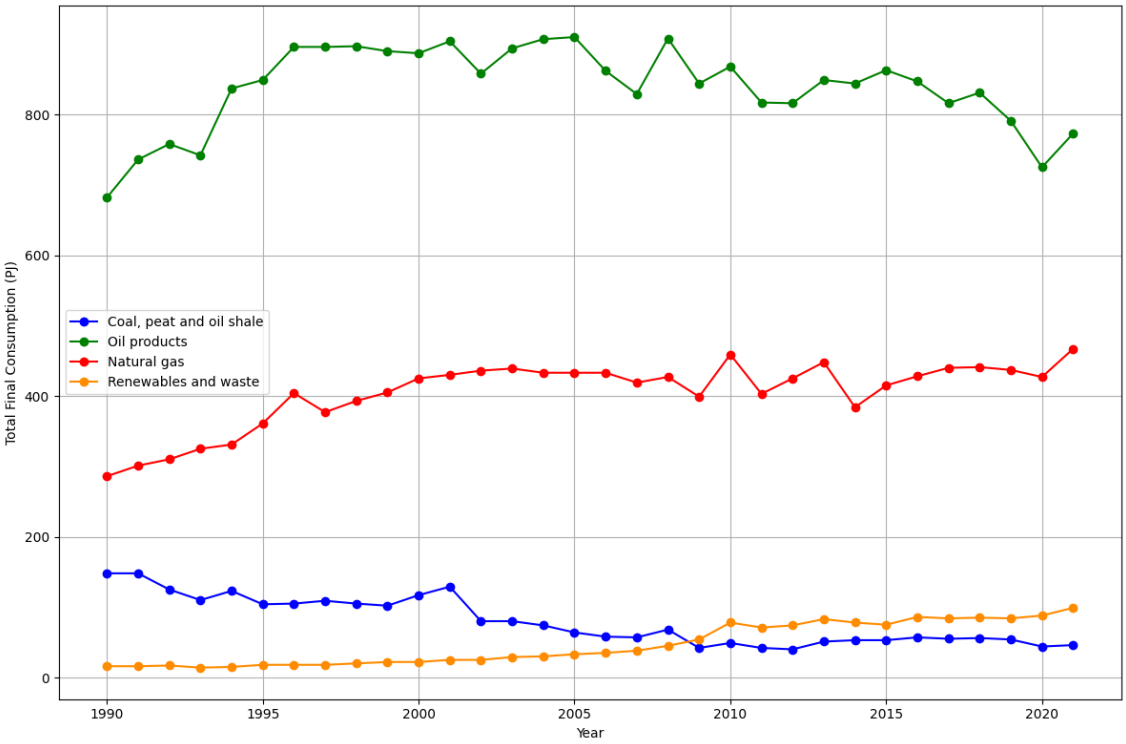


Figure B.3 Energy Consumption of Japan (1990-2021)

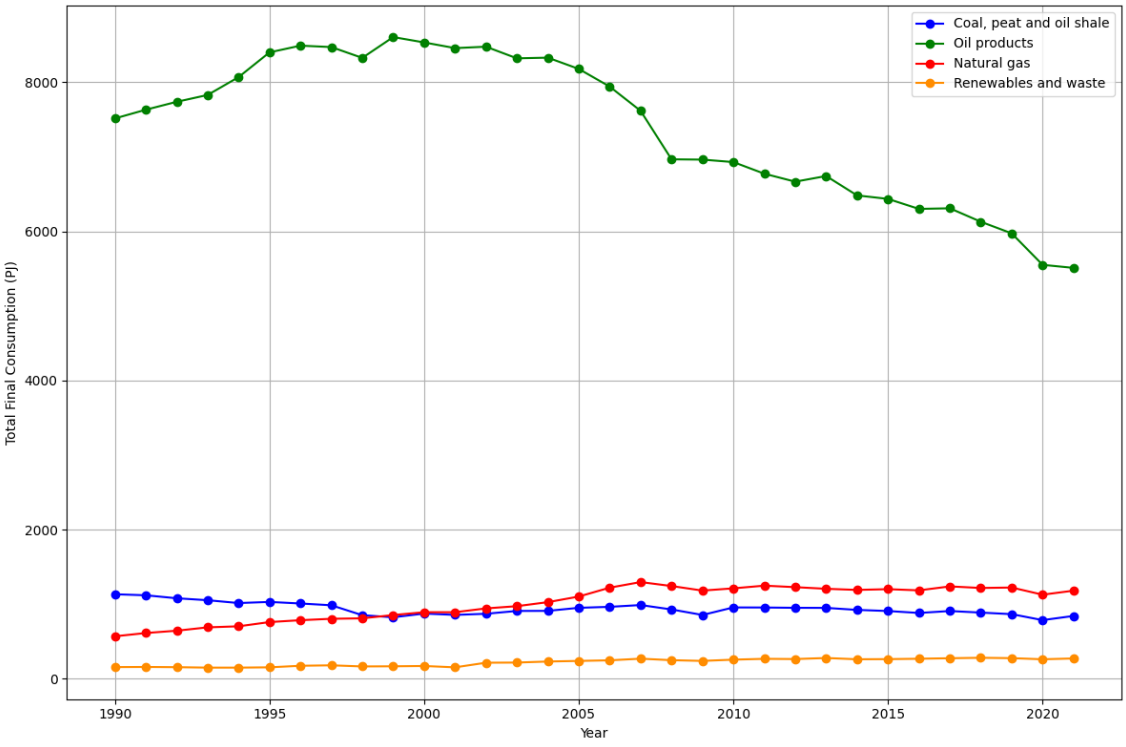


Figure B.4 Energy Consumption of the Netherlands (1990-2021)

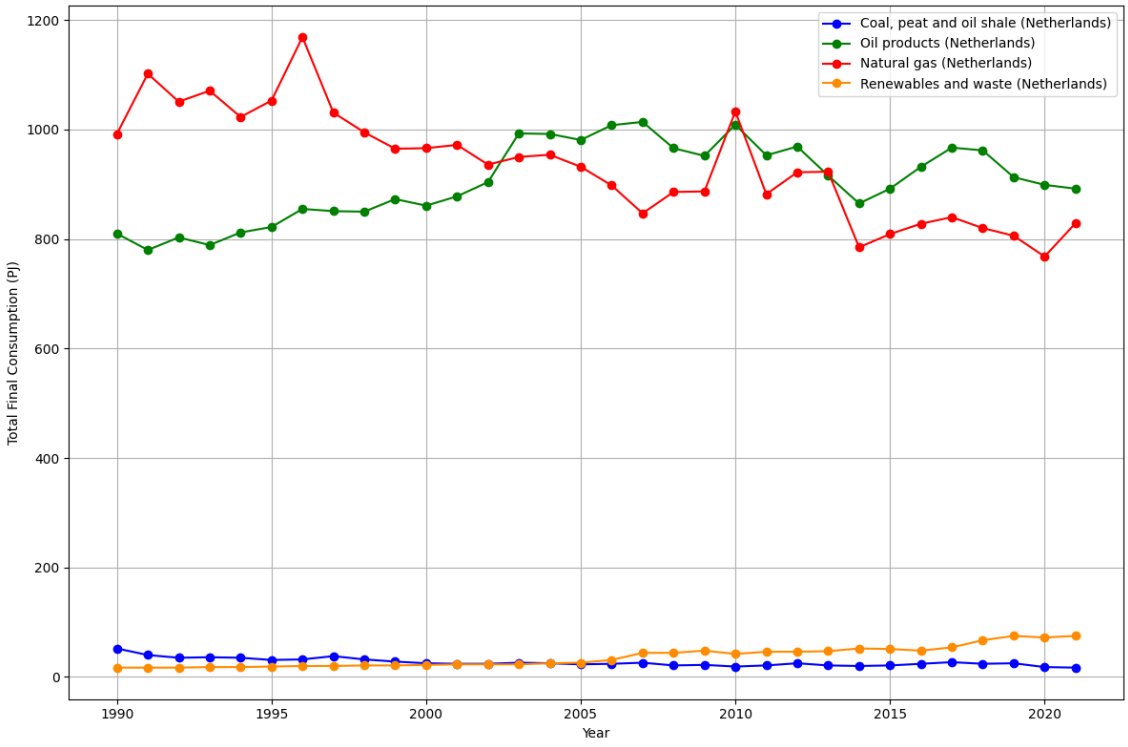


Figure B.5 Energy Consumption of Sweden (1990-2021)

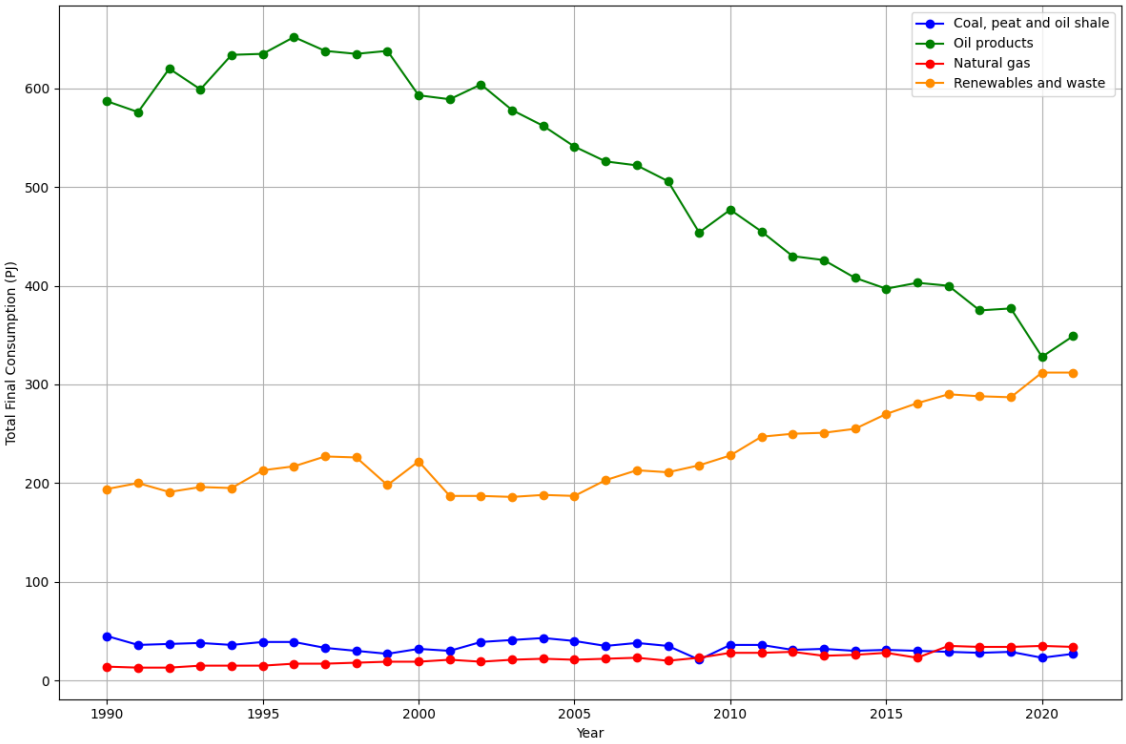


Table 6.1 Electoral Democracy Indexes of Selected Countries

Country	Electoral Democracy (2022)
Denmark	0,92
Belgium	0,9
Sweden	0,9
Switzerland	0,9
Ireland	0,89
New Zealand	0,89
Norway	0,89
France	0,88
Finland	0,87
Spain	0,87
Czech Republic	0,86
Germany	0,86
Australia	0,85
Canada	0,85
Italy	0,85
Netherlands	0,85
Austria	0,84
Chile	0,84
Portugal	0,84
United Kingdom	0,84
Argentina	0,83
United States	0,83
Japan	0,82

Table 6.2 Number of Total Energy Companies of Selected Countries

Country	Total Company	Renewable Energy Companies
United States	247	16
Canada	73	9
Australia	24	0
Germany	17	8
United Kingdom	15	4
Italy	13	0
Spain	13	5
Norway	10	2
Japan	9	1
France	7	2
Chile	5	0
Argentina	5	0
New Zealand	5	0
Austria	3	0
Portugal	3	0
Switzerland	3	0
Belgium	2	0
Denmark	2	1
Finland	2	0
Ireland	2	0
Netherlands	2	0
Sweden	2	0
Czech Republic	1	0