



What are the main future targets and prospects of renewable energy in Ireland?

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Master Science in International Business

National College of Ireland

Submitted to National College of Ireland, August 2022

Submission of Thesis and Dissertation

National College of Ireland
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Acknowledgements

Firstly, I would like to thank my supervisor Gemma Davis who had guide me patiently and with her amazing knowledge. She was always available to answer my questions.

Secondly, I am appreciative to thank my research participants who shared their experience and knowledge about renewable energy even though they had a hectic time at work.

Lastly, I emotional thank my family, and my friends, in particular, Jan Michalik, for their constant support and patience. It was a challenging and special journey for me from beginning to ending.

Dilan Ozen

Abstract

Around the world, many governments, companies, enterprises, and people have started to realize how important it is to use more renewable energy. The energy problem is one of the biggest problems in the world, and this problem continues to grow daily. The increasing population and developing technology demand more energy. Obtaining energy from fossil fuel sources such as coal, oil and natural gas, which are included in the non-renewable energy group, negatively affects environmental pollution and human health. From this point of view, especially fossil fuel-based energy production should be abandoned in a short time. Many natural resources produce the energy required by humanity.

Turning to renewable energy sources is of great importance for the future of the world and for humanity. The aim of this study is to give information about the renewable energy sources in Ireland and what are the future plans for these renewable energy sources.

- Renewable energy sources reduce carbon emissions and promote environmentally friendly energy use.
- They also help to improve energy efficiency and lower air pollution.

They are easier to install than other energy systems because they don't require advanced technology. They are also a very cost-effective energy solution over the long run because they have a lifetime. Solar and wind energy, the two greenest energy sources, are increasingly used to generate electricity for individual households and the national grid.

In terms of the clean energy they can offer and the potential benefits they may have on local economies, these alternative energy sources hold much promise for what they may do for us in the future.

Wind power installation costs continue to be astronomically expensive. However, solar panels make a long-term solution potentially accessible to anyone with a rooftop. The capacity for renewable energy is anticipated to rise by 50% during the following four years, with hydropower, wind power, and solar power leading the charge.

Ireland has been working on renewable energy for a very long time. Many significant developments and state-of-the-art facilities have been established, especially on wind energy. Ireland is very

convenient in terms of wind energy use. Wind energy offers the chance to be used in every corner of the world as a clean and sustainable type of energy that almost does not harm nature. Wind turbines, which require suitable land and wind conditions for their establishment, are also at a low level of efficiency.

However, also covid 19 has affected the energy field as it has affected every area. This study has also studied the effect of covid 19 on plans and the current situation. Interviews were held with professionals working in the energy field.

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1. Chapter 1

Introduction

It is essential to keep energy, economy, and ecosystem in balance. If energy is produced by polluting the ecosystem irreversibly and life opportunities are destroyed, energy will no longer matter. In other words, the ecosystem is clean if there is no energy. But without energy, the continuation of today's life is not possible.

Energy is the primary input of the industrial sector and is the basis of economic production. Without energy, there will be no economic growth and development. For these reasons, a balance should be maintained between energy, economy, and ecosystem for sustainable development. The ecosystem should not be destroyed while using energy resources.

Renewable energy sources are accepted as energy sources that do not have a certain lifespan, can renew themselves during human life, and are inexhaustible. Most renewable energy sources have been formed by the change of form of solar energy or by the effect of heat emanating from the depths of the earth's crust. The importance of these resources is to reduce dependence on fossil fuels by providing energy security to counter the instability of fossil fuel prices. Population growth, developments in living standards, technological innovations, urbanization, and industrialization, bring about a rapid increase in energy demand.

It is increasing as it gives confidence to the producer, contributes to the protection of the ecosystem depending on the reduction of greenhouse gas emissions, and provides new job opportunities.



Figure 1

Non-renewable resources account for 80% of all energy on earth. The need for alternative energy sources has grown due to rising energy use, the potential for fossil fuel depletion, and the harm these sources do to the environment. Technological developments lower the cost of investments and increase their allure, encouraging businesses to participate in the energy sector. With increased government subsidies and interest in renewable energy sources like wind, geothermal, solar, and hydroelectric energy production, assets increased.

Ireland's and the world's renewable energy industries are at a critical juncture. The gas and oil markets have seen significant changes on a global scale. In comparison to prior years, fossil fuel prices are lower, and it is predicted that they won't rise over the coming ten years. Parallel to this, the cost of renewable energy technology has significantly decreased which are especially for wind and solar PV (Gannon, 2017).

According to SEAI (2021), Ireland has made significant development in the direction of reaching its objectives; however, the enhancements had been now no longer sufficient, and it's miles predicted that Ireland will now no longer meet its obligatory EU goal for a typical 17% renewable power percentage with the aid of using 2030. The specific fulfilment is predicted to be among 13.6% and 14.1%. (SEAI, 2021).

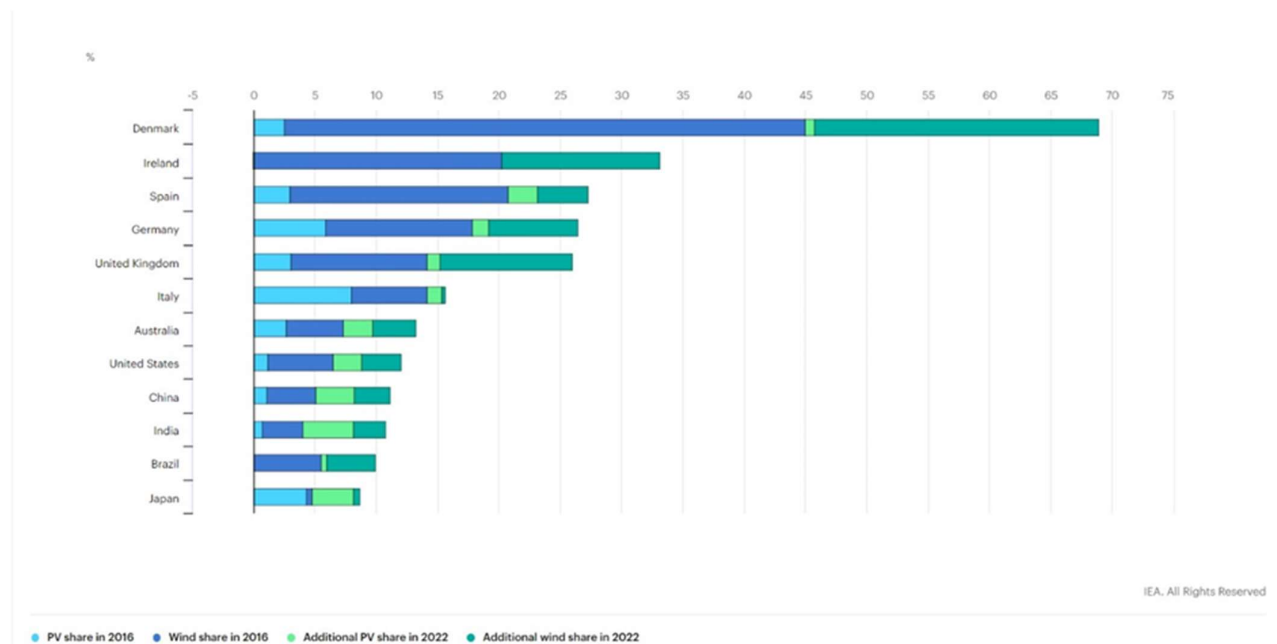


Figure 2

The figure is shown on the previous page. Over 30 years, policies promoting renewable energy have been developed and implemented throughout the EU, including in Ireland. The critical rules of the energy system are those policies, although they are frequently viewed as dry legal papers. These rules are constantly being duplicated and altered by individuals, institutions, new technology, and business models.

According to IEA (2021), with about 165 GW in operation, renewable resources accounted for nearly two-thirds of net new electricity capacity globally in 2016. By 2022, this performance is anticipated to continue to thrive, and there will be an increase in renewable electricity capacity of almost 920 GW. By 2022, solar and wind energy will account for more than 80% of the global growth in renewable power. Wind energy will generate more than 25% of the electricity in various European nations, including Germany and Ireland. According to figure 1, Denmark is expected to overtake Ireland as the international top.

The World Economic Forum (2021) reports that governments throughout the globe are working on switching to renewable energy and tracking their progress toward sustainable energy with the goal of raising energy productivity.

Ireland is an island country known for having great renewable energy sources, which play a large role in supplying Ireland's energy grid. Among these renewable resources, bioenergy, solar, and wind energy may provide Ireland's enterprises and domestic customers with fantastic potential. By using renewable resources, Ireland can increase its sustainability and energy security while reducing its reliance on fossil fuels.

Geographically Ireland is an island at the edge of Europe. Therefore, ideally, wind power is a good potential in the country. On the other hand, Ireland does not have rich fossil fuels, coal and oil reserves. 94 % of energy consumption in Ireland comes from carbon-based fuels. As a result, in Ireland energy prices are particularly low by developed-world standards, and energy-intensive industries are unlikely to invest in new facilities in Ireland. Even if Irish expenses are greater than those in other rival nations, Irish businesses should pay the total economic cost of energy in all situations. (John Fitz, 2005, p.2)

Problem definition

Since 2016, Ireland has made progress toward realizing many renewable energy projects. However, covid 19 has affected the energy sector and many things in this process.

We can see the figure 3 showing the 2020 targets below. During the preparation of this chart, a situation like covid 19 that affected the whole world had not occurred yet.

The European Union is moving in the right direction. 22 of the 28 member states raised their percentage of renewable energy in 2016. However, not all members are performing equally well, and some need to put more effort to fulfil the EU targets by 2030.

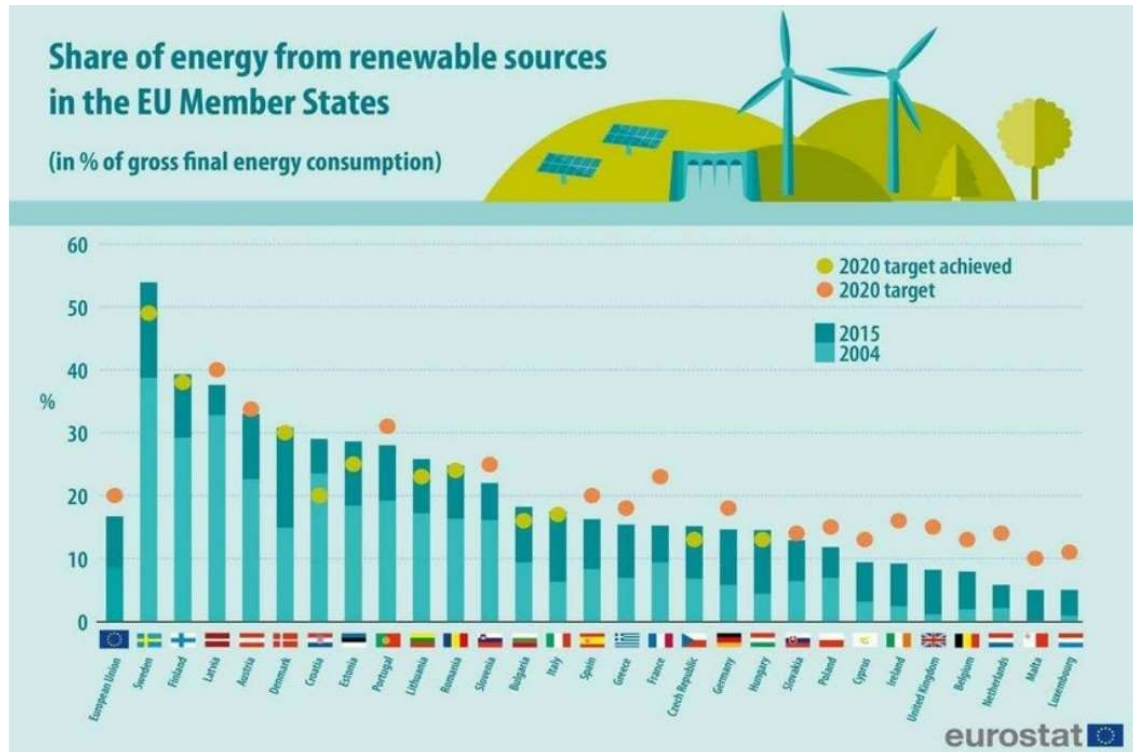


Figure 3

In 2015, the EU's use of renewable energy increased to approximately 17 per cent. This aim is close to the 2020 aim of 20 per cent and trebles the 2004 share of 8.5 per cent.

The European Union launched its ten-year employment and growth plan, Europe 2020, two years after the financial crisis. One of its goals was to meet 20% of the EU's energy demand with renewable sources by 2030.

Country	2015	2020 target	Points off target ▼
Croatia	29	20	-9
Sweden	53.90	49	-4.9
Estonia	28.6	25	-3.6
Lithuania	25.8	23	-2.80
Bulgaria	18.2	16	-2.2
Czech Republic	15.10	13	-2.1
Hungary	14.5	13	-1.5
Finland	39.30	38	-1.3
Denmark	30.8	30	-0.8
Romania	24.8	24	-0.8
Italy	17.5	17	-0.5
Austria	33	34	1
Slovakia	12.9	14	1.1
Latvia	37.6	40	2.40
Slovenia	22	25	3
Poland	11.8	15	3.2
EU	16.7	20	3.30
Germany	14.60	18	3.40
Cyprus	9.4	13	3.6
Spain	16.2	20	3.80
Malta	5	10	5
Belgium	7.9	13	5.10
Luxembourg	5	11	6
Ireland	9.20	16	6.80
United Kingdom	8.20	15	6.80
France	15.20	23	7.80
Netherlands	5.80	14	8.20

Figure 4

According to SEIA 2021, government investment of €121 million was distributed through programs SEAI administers on the government's behalf. In 2020, 17,600 homes were upgraded for increased energy efficiency, 4,840 new electric vehicles entered our private car fleet, and 90 public building retrofits were delivered, among many other measures. These figures show the ongoing connection between our economy, energy use, and emissions and the market's growing desire for decarbonisation of our energy system. But following a brief decrease in 2020, emissions are already rising back near pre-pandemic levels.

This dissertation will explain Ireland's future targets which are the impact on the Irish economy, what problems are demanding for future energy, and how covid-19 affected the renewable energy industry.

- What are Ireland's plans for current renewable energy and future potential in 2030?
- How were COVID-19 impacts on 2020 energy data?
- What are Ireland's most significant obstacles in meeting the renewable energy targets, which are heat, energy and transport sectors?
- What are the biggest obstacles to effectively and securely incorporating further use of green energy in the power sector?

Aims and Objectives

This study will show us the renewable energy resources in Ireland,

- what studies have been done on these resources, and
- what will be done in the future will be examined. What has changed in our lives regarding renewable energy will also be shown. In addition, Covid 19 has affected the sector.

The research on renewable energy is described in the literature review. Ireland needs to accomplish its energy goals and the use of renewable technology. The topic is relevant now and significant for the entire world. Not only important in Ireland. Ireland is moving closer to decarbonizing its energy system and is concerned about climate change.

CHAPTER 2: Literature Review

One of the biggest problems the world is currently facing is climate change. To meet this challenge, the economy as a whole must reduce carbon emissions significantly, and the transition to a net-zero energy system must happen quickly. Ireland is dedicated to leading the way in addressing climate impact. Regarding research, renewable energy is the future for humanity and the environment. The world, especially Eu countries, has been improving its targets for renewable energy. Improving their plans for renewable energy will impact their economy, investments, and clean energy for future householders.

The use of renewable energy has the potential to improve both the environment and quality of life. Developing renewable energy will improve our living standards and the environment. It has been a

while since many people have taken care of the climate change problem. Using renewable energy will have moved our world in the right way. (National Energy Climate,2021)

The economic crisis of 2008 left Ireland's economy in good shape. Ireland has not been able to sever the link between emissions and rising affluence, as seen by the fact that emissions have increased again in recent years despite the recent improvement in the economic outlook. Irish economy must be decarbonized if energy consumption is uncoupled entirely from population and economic growth.

Ensure that the EU achieves the requisite 43% reduction in GHG emissions. Ireland's approach to decarbonisation is in line with EU climate ambitions. The EU Effort Sharing Regulation covers emissions from all other industries, including agriculture, transportation, buildings, and the light industry.

The main topic of this dissertation is the future target of renewable energy in Ireland, which renewable energy has potential industry boost on the economy and also how covid 19 affected the sector. The study will illustrate the potential and current situation of renewable energy in Ireland. Therefore interviews have been had with professional who is working in the different renewable energy industry such as electric, solar and wind.

Introduction

Renewable energy sources; It can also be called sustainable or clean, natural and inexhaustible energy resources. Renewable energy sources are called 'Green Energy Sources' or 'Sustainable Energy Sources.' Many approaches, classifications, and definitions regarding energy and electricity production are based on energy resources.

In this section, the types of renewable energy in Ireland will be explained. Which renewable energy does Ireland have, and how are investments made in these types of energy? How do these investments affect the economy and the environment? In the following sections, the future renewable energy plans planned until 2030 will be discussed.

Ireland's energy sector

Ireland saw exceptionally robust economic growth throughout the 1990s and the early 2000s, especially from 1993 onward. Due to this, the Gross Domestic Product (GDP) in 2007 was almost three times greater than in 1990. The economy entered a recession in 2008 that grew worse in 2009. Despite the recent economic downturn, Ireland's total annual primary energy demand increased by 57 per cent between 1990 and 2009 (compared to 70 per cent between 1990 and 2007 (Howley et al., 2010).

Fossil fuels, which made up 95% of all energy used in Ireland in 2009, were primarily responsible for meeting this growing energy demand. With a share of 52% in 2009 (up from 47% in 1990), oil has surpassed natural gas and coal as the world's leading energy sources (8.5 per cent). From a low base of 1.8 per cent of primary energy requirements, renewable energy increased to roughly 4.5 per cent, primarily due to an increase in wind energy capacity. Energy imports have risen significantly recently due to Ireland's fast-rising energy consumption and declining domestic output. Ireland has a high reliance on imported fossil fuels, which made up 89 per cent of total consumption in 2009. (SEAI, 2012).

According to the EU Renewable Energy Directive, Ireland has a legally binding target of using 16% renewable energy by 2020. The Irish government set goals of

40% renewable electricity,

10% renewable transportation, and

12% renewable heat to accomplish.

Although Ireland will fall short of the total target due to insufficient renewable energy in the heat and transportation sectors, today's SEAI results reveal that Ireland met our 40% renewable electricity goal. (SEAI, 2021)

This dissertation will discuss why Ireland could not reach their targets, what the covid19 affected and how they are planning to improve by 2030.

Renewable Technology	Installed Capacity MW	Electricity Generated GWh	% of Gross Electricity (actual)	% of Gross Electricity (normalised)
Hydro	238	806	2.8	2.5
Wind	2,440	6,573	22.8	21.1
Biomass & Renewable Waste	49	275	1.0	1.0
Landfill Gas	49	172	0.6	0.6
Biogas	9	30	0.1	0.1
Solar	2	2	0.01	0.01
Total	2,787	7,857	27.3	25.3

Figure 5

Ireland's national goal concerning the EU internal energy market is to integrate further Ireland's wholesale electricity market and its regulation with the EU internal energy market (IEM), building on well-known continuing plans, programs, and initiatives.

In order to meet Ireland's objective to reduce greenhouse gas emissions, new technologies must be created and implemented.

Ireland has set a goal of having 34% of its energy consumption come from renewable sources by 2030. Increase the percentage of renewable energy used to produce power to 70% and 3.5 GW or more of offshore renewable power.

In the upcoming years, Ireland must develop and use innovative technologies to achieve its goal of lowering greenhouse gas emissions.

Decarbonisation and sustainable living, as well as intelligent and sustainable food production and processing, are two priority areas.

Assist the EU in increasing energy efficiency by at least 32, 5% by 2030. Ireland must undertake a wide range of activities and initiatives outlined in the Climate Action Plan to reach the EU's 2030 emission targets and attain net zero emissions by 2050.

The Climate Action Plan lays out a clear set of policy actions and targets for 2030 that will put us on track to meet the country of Ireland's goal of having net zero-carbon energy systems by 2050.

Several initiatives in numerous areas will help Ireland reach its national energy efficiency commitment in terms of energy efficiency.

Heating

The Plan also calls for a switch to alternate heating methods, with goals of installing 600,000 heat pumps between 2021 and 2030.

Through new regulatory criteria for home heating systems, oil boiler installations will be effectively prohibited starting in 2022, and gas boiler installations will begin in 2025 in all new homes. Oil and gas boilers in existing homes should be gradually phased out using a combination of incentives, education, and regulatory measures.

Transport

In terms of the clean energy they can offer and the potential benefits they may have on local economies, these alternative energy sources hold much promise for what they may do for us in the future.

The capacity for renewable energy is anticipated to rise by 50% during the following four years, with hydropower, wind power, and solar power leading the charge. Wind power installation costs

continue to be astronomically expensive. However, solar panels make a long-term solution potentially accessible to anyone with a rooftop.

Agriculture

Additionally, the strategy seeks to significantly reduce greenhouse gas emissions by implementing several specified farming practice modifications.

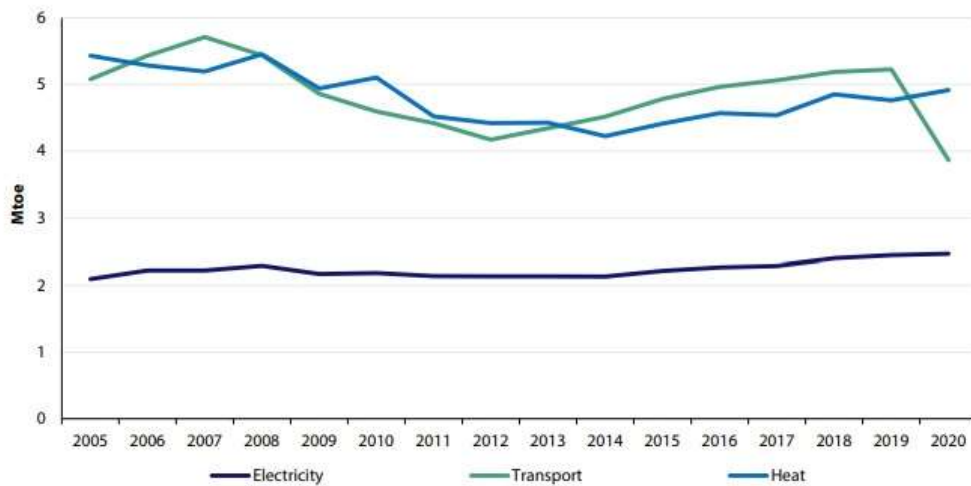
Generation of electricity

By building 12 GW of renewable energy capacity, the Plan seeks to raise the share of renewable energy from 30% to 70%.

Public Sector

By 2030 public sector energy efficiency target of 50%

By 2030, all public buildings will have Building Energy Ratings.



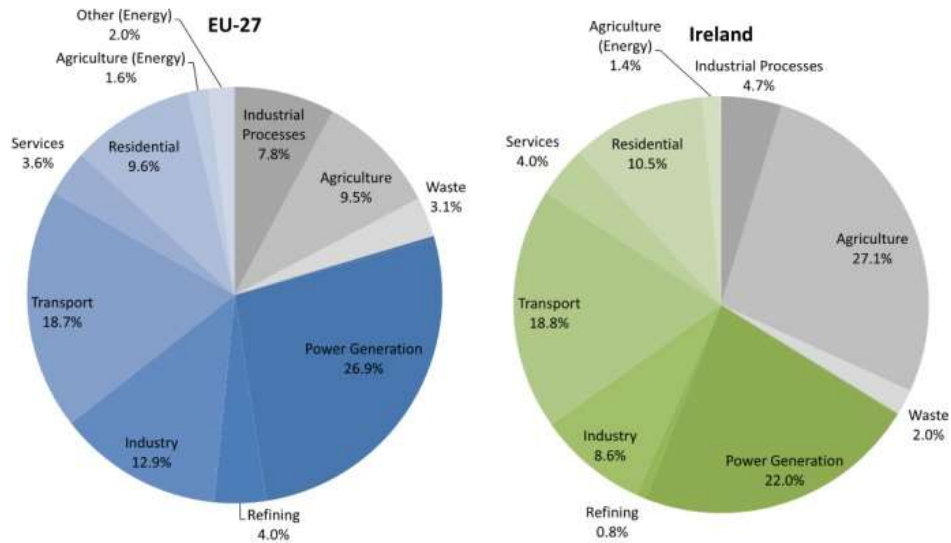


Figure 6

Comparing Ireland's proportion of the EU-27's 2005 GHG emissions in the context of the objective for Non-ETS emissions, the role of agriculture is particularly prominent. In 2010, 42.5% of Ireland's non-ETS emissions came from agriculture. The country's land use patterns and the kind of activities carried out there have a significant impact on these emissions levels. The largest indigenous industry in Ireland, agri-food, accounts for around 7% of Ireland's GDP and 61% of the country's total land area. The cattle and dairy industries, of which more than 80% are exported, are the ones that contribute the most to greenhouse gas emissions.

Non-ETS : a portion of domestic greenhouse gas emissions not included in the EU Emission Trading Scheme

GHG :Greenhouse gases

The EU will maintain its strong track record of tackling climate change and fostering concurrent economic growth over the next ten years. Compared to 1990, the EU's emissions were down by about 25% in 2019, but the economy grew by 62% during that time. That demonstrates that we can combat climate change while ensuring long-term economic growth and job creation. A decrease in emissions of 55% from 1990 levels by 2030 is achievable economically and advantageous for Europe with the right policies.

Wind energy

Wind energy has historically been Ireland's most effective form of renewable energy. Ireland's most significant source of renewable electricity has remained wind power over time. In Ireland, the installed capacity produced by using this resource has increased to 2,851 MW.

Ireland has enormous potential for wind energy. Ireland has advantages from its massive territory in the Irish Sea and the Atlantic regarding offshore energy, making it one of the most affordable renewable sources in Europe. Additionally, technology for wind energy integration into the grid and wind turbines will progress during the ensuing decades. Ireland is projected to rank among the top renewable electricity producers for the European market by 2030.

Wind energy experienced a record-breaking year in 2020. With onshore wind power surpassing 700 GW and offshore wind power surpassing 35 GW, the installed capacity of wind energy worldwide grew by 93 GW to 770 GW.

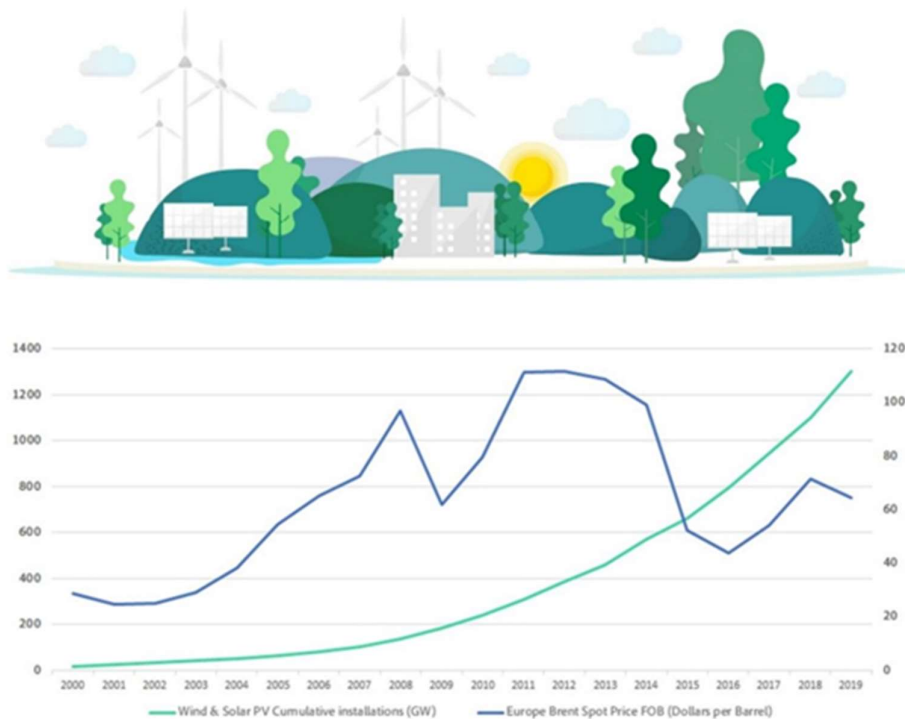


Figure 7: Illustrates wind and solar Pv installations

The remarkable year demonstrated the resiliency of renewable energy sources; the global pandemic had impact on wind power installations, and demand for renewable energy sources. Market expansion will continue in the coming years.

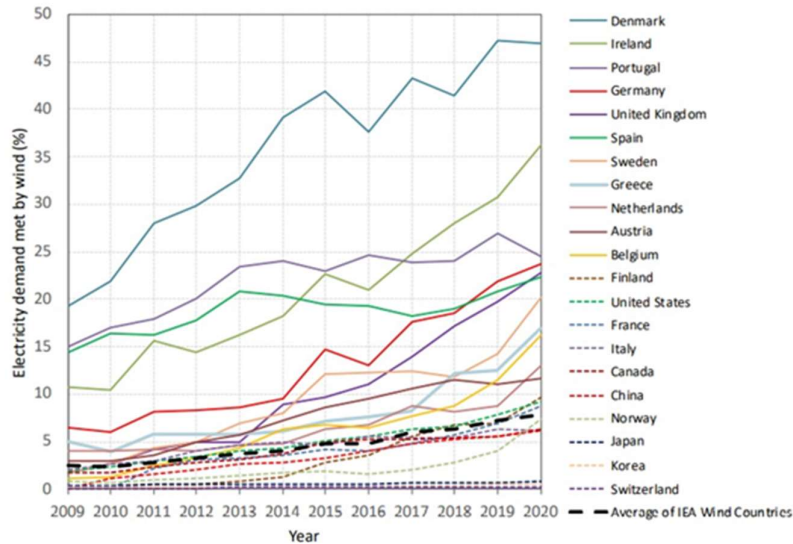


Figure 8: Illustrates Ireland beyond Denmark: wind energy

Despite cost-cutting successes, market uncertainties in the future regarding demand and financing availability may have an impact on the deployment of wind power. New regulatory structures are also necessary to achieve the lofty goals for 2030 and beyond. For the adoption of wind energy, long-term visibility and solid regulatory frameworks will remain essential. Lower-than-expected growth rates have been attributed to regulatory program gaps and changes in various nations, including Germany and Ireland.

Brexit and the UK epidemic have made the investment environment uncertain. Since no new licenses have been awarded, it is already anticipated that Norway's excellent deployment rates will end after 2022, affecting deployment through 2027. Sweden is still debating whether to eliminate project grid connection fees to make up for higher offshore costs than onshore. Some good things happened in 2020. In Greece, the offshore embargo was overturned, and the land-based wind was again included in auctions in the UK. While waiting for new laws, Austria had a year of installations; in 2021, it is anticipated that this will result in funding for the backlog of projects.

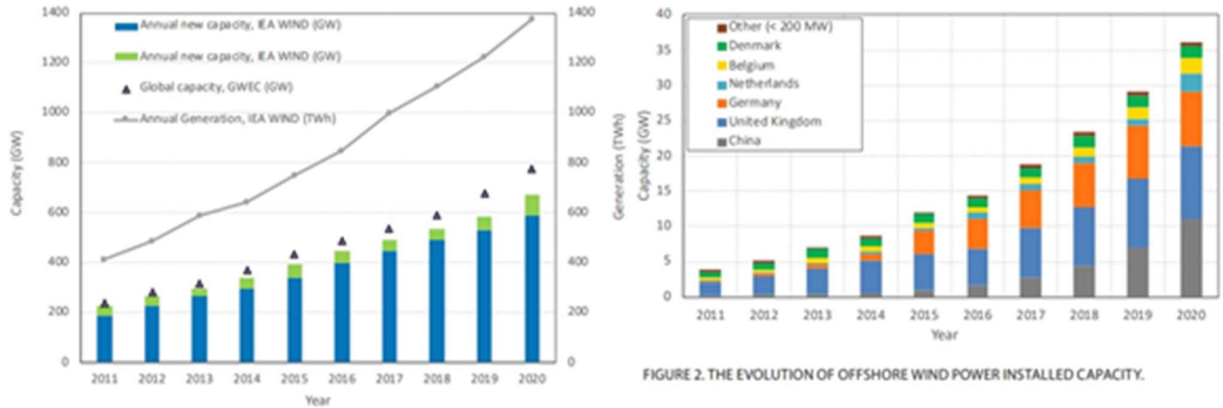


FIGURE 2. THE EVOLUTION OF OFFSHORE WIND POWER INSTALLED CAPACITY.

Figure 9: Wind power capacity

Bioenergy energy

Bioenergy has been the primary source of renewable heat in Ireland, and it is anticipated to continue to be a significant contributor to the replacement of fossil fuels, particularly concerning the more prominent heat users, such as the industrial and commercial sectors.

Currently, biomass produced domestically provides 3.5% of Ireland's energy needs. With a bioenergy potential of about 30%, this contribution will probably increase by 2035. Considering current energy market pricing, this potential comprises forestry, energy crops, agricultural waste, and other wastes. Regarding bioenergy sites, biofuel refineries in Ireland have developed to a relatively small extent, mainly because they need to be quite large to obtain economic scale.



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Figure 10: Bioenergy reserves

To sum up, Ireland's climate is favourable for bioenergy crops. However, reaching the 12 per cent renewable heat target will be difficult, and further work is needed.

Solar energy

Solar; In a word, the sun can be defined as the energy emitted from the sun. Solar energy, namely solar energy, is the radiation energy released due to the transformation of hydrogen atoms in the sun into helium atoms. The sun is so big that 1 million earth can fit inside it, and the amount of energy it emits is so significant that 564 million tons of hydrogen turn into 560 million tons of helium per second.

The Department of Communications, Climate Action and Environment (DCCA), which accepted the technology as a part of the Renewable Electricity Support Scheme (RESS), released in July 2018, has acknowledged the advantages of solar PV to Ireland's energy mix.. The government's goal of expanding investment in emerging technologies may benefit the solar industry at the first auction by encouraging a more diverse mix of energy sources in Ireland.

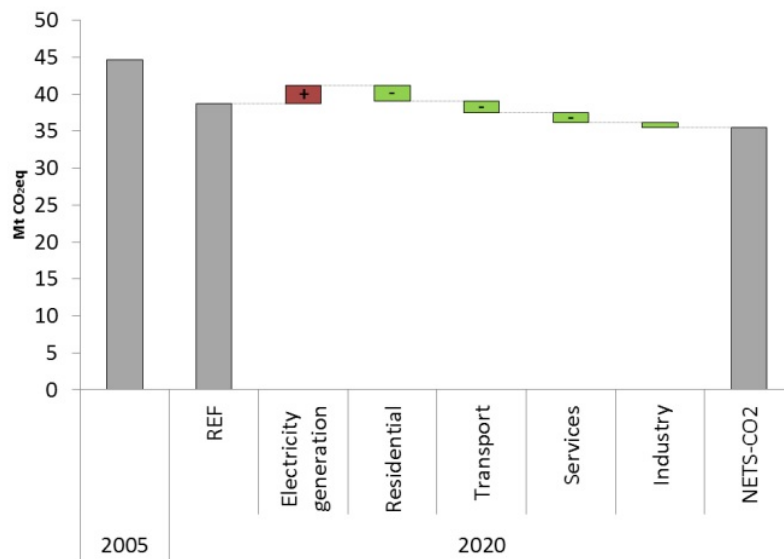


Figure 11

Barriers to national offshore wind development and best practices focus on market integration and the aggregation of national renewable energy trajectories for offshore wind till 2030. Ireland also consulted with the other North Seas nations regarding its National Energy and Climate Plan's anticipated offshore wind deployment through 2030 and associated grid planning issues.

Ireland dedicates to securing our energy infrastructure at the lowest possible cost. The security of Ireland's natural gas and electrical systems' energy supply is now being reviewed. Ireland possesses significant energy sector assets that can be applied to the solar PV industry, including research and development, building materials, systems integration and optimization, a high-value manufacturing base, and onshore wind knowledge.

Covid 19 how impacted the Irish renewable industry

The unprecedented situation of the worldwide outbreak of Covid19 and consequent government restrictions in the context of the pandemic had a significant influence across all industries. The renewable energy industry was not an exception. The consequences of previous unprecedented years had a crucial effect on the current situation within the sector and because of that, there will be in following paragraphs closely examine particular parts of those years as well as the general outcome of that crisis, which also depict possible future ways and intentions.

When we look into the first months of the pandemic, there is a study from Hosseini (2020), which was published in May 2020, which is describing the literally first two months during which almost all countries around the world introduced full lockdown, unprecedented and draconic restrictions in Europe. The immediate impact of these restrictions on the renewable energy industry was according to him, mostly the closing down of the renewable energy manufacturing facilities, which consequently caused significant disruptions to supply chains and companies. Companies experienced massive delays and slowed down transition processes to renewable energy alternatives.

Eroğlu (2021) describes another dimension of the first year of the pandemic which was questioning various ecological, renewable, and sustainable policies across all sectors. In other words, what the pandemic showed us, was a significant shift away from the importance of ecology. In those moments were the questions of public health much more important and we could see a rapid increase of single-use plastic items. An analogous situation was also within the renewable energy sector when at first the ecological motivations decrease to a minimum. On the other hand, during the second half of the pandemic, we experienced a significant decrease in fossil fuel demand, which consequently caused a fall in its prices. This caused a shift into substituting coal-based power plants with gas ones, which is from an ecological point of view producing significantly less air pollution. From the current point of view and in the context of Russian aggression in Ukraine, the ideas developed during the Covid19 era do not look realistic anymore.

Hoang, Nižetić, Olcer, Ong, Chen, Chong, & Nguyen (2021) in their study described the overall outcomes of the pandemic within the renewable energy sector. The most visible one is according to them that the pandemic brought visible and tangible evidence that a massive reduction of emissions can bring pretty quick results – we could see a comeback of dolphins into the channels in Venice in Italy, a clear sky over a huge city, etc. This put a spotlight on the efficiency of renewable energy sources, as the results of using them might be pretty quick and visible. Secondly, they mention that during the pandemic there was a massive loss of jobs and working positions across industries and it is an opportunity for the government to create new jobs within the renewable energy industry. On the other hand, they mentioned possible concerns over cheap prices of gas and oil, which can the shift towards renewable energies significantly slow down (the study was published in 2021). With the current situation with Russian aggression are these concerns irrelevant and are the massive opportunities for this sector, which were created during the pandemic stay still possible?

Conclusion of Literature Review

In conclusion, Ireland has made significant strides in achieving its energy efficiency and renewable energy goals. But these initiatives must be expanded going forward. Additionally, the rapid economic expansion and the persistently low oil prices have increased the energy demand, making it even harder to meet energy requirements. This part illustrates us which renewable energies Ireland has, what is the current situation and potential. How Ireland has improved their target and what will be the future targets. This will be linked between research questions and interviews. Also, energy policy must be continued to encourage the adoption of renewable energy technology and energy efficiency. The literature illustrates that wind capacity is necessary to meet the 2030 targets.

Chapter 3: Research Method

Research Rationale

According to the SEAI (2021), Compared to other energy types wind energy is the most significant aid of renewable energy in Ireland and is less expensive. Approximately %22 of electricity was provided by wind energy in 2017. This year's total energy consumption was %86 in Ireland.

But, in 2020, the public health efforts adopted to battle the Covid-19 situation had far-reaching consequences for many parts of society, including our energy use and CO2 emissions in the whole world. The total amount of energy used was significantly lower than in prior years, with transportation accounting for most of the decline. In this research, I would like to compare how Covid-19 impacted the renewable energy industry, how changed future targets and is there any next pandemic that the industry is going to use its potential. Also, I will focus on current problems and

investments that have been improving since covid-19. Is there any new policy about the prospects of renewable energy?

Literature Review

In the year 2020, Covid-19 and other public health policies had a tremendous impact on Irish society and the economy. The awful loss of life and significant disease, as well as the resulting burden on our health services, were the most immediate and damaging effects. (SEAI, 2021, p.10)

According to the Sustainable Energy Authority of Ireland (2020) when we look through the perspective of energy, especially during Covid-19, national and international travel limitations impacted the transportation sector, and supply-chain disruptions influenced energy consumption patterns in schools, and universities and civil service.

There are significant CO2 emission reductions, such as 11.4 per cent in 2020, it's important to remember that much of the difference was driven by temporary public health measures in response to the Covid-19 pandemic and isn't indicative of long-term trends toward a renewable energy industry.

Despite Covid-19, the renewable energy industry is at a crucial moment in Ireland. Significant developments in the gas and oil markets may be seen all over the world. Prices for fossil fuels are lower than in prior years, and they are not predicted to rise in the coming decade. Parallel to this, renewable energy technologies, which are solar PV and offshore wind, have seen considerable price reductions.

By 2010, the European Union wants to generate 21% of its electricity from renewable sources. The Directive 2001/77/EC on promoting renewable electricity established this goal. While some countries, such as Germany, Spain, and Denmark, are on course to meet their goals, others lag far behind.

The Renewable Energy Framework Directive must preserve and strengthen existing renewable energy legislation frameworks. In addition, minimum requirements for removing administrative barriers must be established, including streamlined procedures such as one-step authorization.

In 2018 Ireland had some targets for 2020 such as transport, heat and electricity. The aimed target was 16% but the country reached 11%. Targets were:

	2018	2020
Electricity	33.2%	40.0%
Transport	7.2%	10%
Heat	6.5%	12% (SEAI, 2018, p.4)

In 2020 Ireland did not reach their target. But there is a big improvement compared to 2015. In 2015, the share of energy from renewable sources in the final consumption of energy was 3.1%. Therefore, I will analyse the difficulties that Ireland faced and how could improve its target compared to the other European countries. (SEAI, 2021, p.12)

There are some important aims for renewable energy which are

- Energy safety
- Environmental preservation
- Cost of competition capacity

According to Professor Brian Ó Gallachóir of the Environmental Research Institute at University College Cork, in 2050 Ireland will have a low carbon economy. But there are two important subjects which are society and policy it's challenging.

In 2013, renewable energy accounted for 7.8% of Ireland's total energy consumption. The EU Renewable Energy Directive (2009/28/EC) sets a required objective of increasing this to 16 per cent by 2020. Ireland's renewable energy aim of 16 per cent adds to the EU's overall goal of 20 per cent renewable energy utilization by 2020. The European Council agreed in November 2014 to set a target for the EU to reach a 27 per cent renewable energy contribution by 2030.

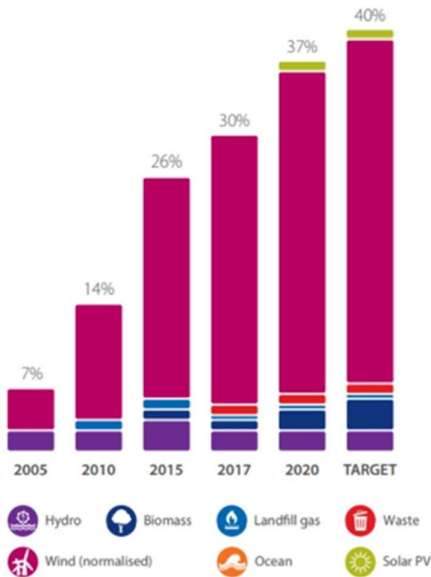


Figure 12

Research Questions

This dissertation will focus on “What are the main future targets and prospects of renewable energy in Ireland?” There are also some following questions related to subjects:

- What are Ireland's plans for current renewable energy and future potential in 2030?
- How were COVID-19 impacts on 2020 energy data?
- What are Ireland's most significant obstacles in meeting the renewable energy targets, which are heat, energy and transport sectors?
- What are the biggest obstacles to effectively and securely incorporating further use of green energy in the power sector?

Research Methodology

This project aims to explore the current situation and future target of renewable energy by 2030.

Any research's quality is dependent on the data collection techniques used. Therefore, this part is significant to explain and define methods used to collect and understand data in the study. Thus, the methodology needs to consider the topic and the purpose of the study.

The proposed research will focus on Ireland's renewable energy system to improve its target that understanding the future potential and ongoing projects. While collecting information and data will

explain the benefits of renewable energy for the country. I would also like to work on climate change and current renewable energy projects in Ireland. I will utilize my work based on the proposal, company's information, articles and research.

Research Philosophy

The term research philosophy refers to a system of beliefs and assumptions about knowledge development. Although this may sound elevated, it is precisely what you are doing when you research: expanding your knowledge of a specific topic.

There is some approach such as positivism, critical realism, interpretivism, postmodernism and pragmatism in business. (Saunders, Lewis and Thornhill, 2015, p. 130) These number of research philosophies are accessible online. It is really important to choose your philosophical approach to your subject.

In this proposal, I will work on the interpretive approach in business. I am going to interview people who are working with renewable energy on companies, had to experience in this area, have been studying renewable energy and some professionals. As we know, the interpretive approach collects data, analyse and focuses on their experiences. This study aims to explore the challenging subjects, understand the current situation and be creative for future targets in renewable energy in Ireland.

Research Design

One of the ways of research methodology construction is based on the theoretical concept of the "research onion", proposed by Saunders et al. (2016). The research onion describes the primary layers or steps that must be completed to build a successful technique in a rather tiring manner.

The research methodology has its starting point with delineation of the main philosophy, choosing approaches, methods and strategies as well as defining time horizons, which altogether take the research logic to the research design – main techniques and procedures of data collection and analysis.

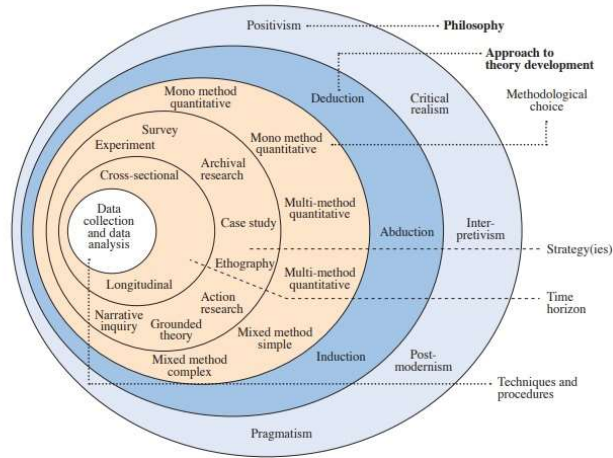


Figure 13: Saunders, Lewis and Thornhill, 2009, p. 108.

Data Collection Method

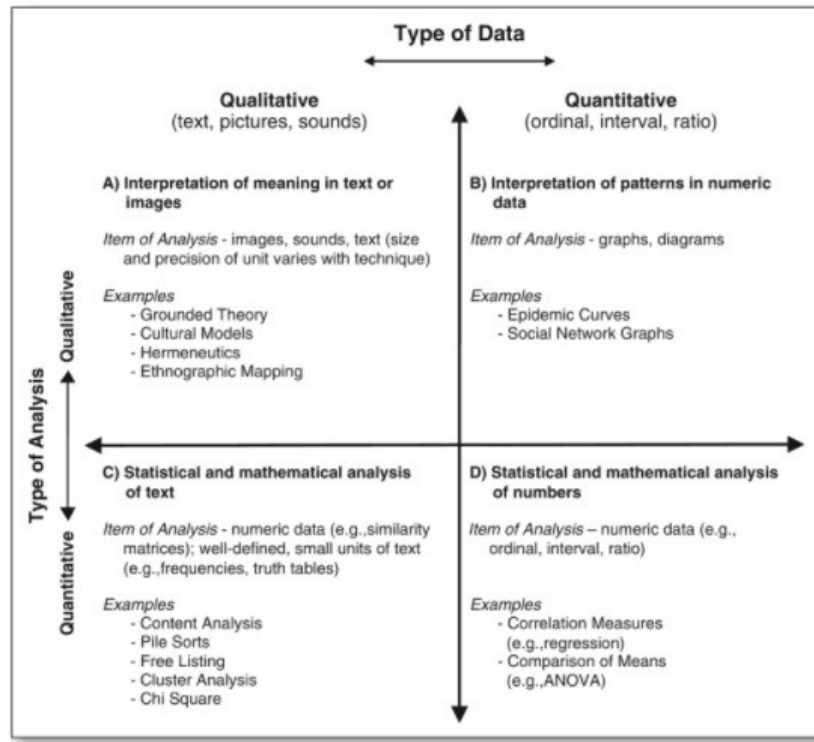


Figure 14: Qualitative and Quantitative Data Analyses (Bernard, 1996)

For this proposal, I will use primary and secondary sources to collect data. Firstly, primary data will provide an understanding of the research questions. Secondary data collection will be used from research, thesis, study cases and e-books. I will analyse renewable energy targets and problems in Ireland, including some important online websites, which are Research Gate, Academia.edu, JStore, Doaj and school library books for understanding the importance of future targets of renewable energy in Ireland. These opportunities will set a higher amount of data consisting of my proposal.

This dissertation will consist of a qualitative research framework with these secondary data. This certain amount of data will aim to the proposal more convenient.

Data Analysis Method

This re to interview people who have been working in the renewable energy industry. Also, another aim is to collect different opinions for future targets about renewable energy by 2030. There will be interview questions to ask the participants. During the interview questions can be changed or depends on the participant's experiment. But also the researcher must be aware of the questions' nature since it will help them answer the research questions and accomplish the study goals.

The secondary thematic framework method will deeply focus on my proposal subject and make allowance for the contents related importance of targets, problems and the current situation of the

renewable energy industry in Ireland. Secondary data analysis will aim to more accurately and detailed understand the contents. Secondary data analysis will be a predicate on and reach the research subject.

There is an invitation letter to participate in a scholarly study and an information letter with critical facts information the survey was sent to the renewable energy specialists in advance through email. The individuals who consented to participate in the study chose a time and location convenient for them to hold the interview. All participants gave their time voluntarily, and they were free to withdraw at any moment.

The participants had access to the semi-structured interview guide in advance, allowing them to get ready for the interview.

The researcher sought consent to record the interview at the preliminary stage. The interviewees were made aware of their right to privacy, the confidentiality of the information provided, the fact that the researcher would only use it, and the fact that it may be erased upon request.

The participants were also requested to sign a consent form after being informed about the interview's transcription. Consequently, the discussions were managed according to ethical principles.

Ishtiaq (2019) asserts that data analysis is essential since it enables the researcher to assess the findings. The data gathered during the data gathering phase determines the data analysis process. This paper's focused qualitative data have been collected related to thematic coding-based qualitative analysis. Although the researcher initially created the transcript through the Microsoft teams transcription process and structured it. Each interview transcript has been kept in a separate word processing file.

Ethical consideration

The phrase "ethical consideration" can be characterized as a collection of guidelines that must be followed by a researcher when conducting a dissertation since they influence the study design and methods. While collecting primary and secondary data from the samples, researchers and scientists must abide by several codes of conduct.

The researcher placed the protection of the rights of research participants as the top ethical priority (Poppleton 2020). The researcher ensured that none of the study subjects experienced any kind of injury throughout the investigation. Second, the researchers gave respect for the participants'

dignity priority. There were no inquiries during the poll that could have had an impact on the respondents directly.

In addition, it was clear that participants could refuse to answer any questions they felt were inappropriate or would otherwise impair their dignity. Second, the researcher prioritized getting complete participant information before starting the study. Additionally, the research participants' confidentiality has been guaranteed for the organizations and the people involved.

Exaggerating the goals and objectives and engaging in fraud have been prohibited. According to Hong et al. (2018), researchers must disclose all relationships, including financial support sources and potential conflicts of interest. However, it has been avoided because this research lacked the same.

Information sheet for Participants

My name is Dilan Ozen. I graduated in materials engineering in Turkey. Also, I have done my master's degree in smart and renewable materials at Gebze Technical University in Istanbul. I am taking the final steps toward a Master's degree in International Business at the National College of Ireland. My supervisor is Gemma Davis who is guiding me for this dissertation. I also obtained ethical approval to undertake this dissertation.

Excellent renewable energy sources, abundant in Ireland and essential for supporting the nation's energy infrastructure, are well known worldwide. According to the EU Renewable Energy Directive, the Irish government is obligated to producing X% of total energy from renewable sources by 2030.

The dissertation will illustrate future targets of renewable energy in Ireland. Also, affection for covid-19 and some comparisons between Ireland and European countries.

How it will go

Professionals in the Irish energy sector will be interviewed in a semi-structured interview process to get the primary data. There is a list of questions which will be asked to the participants.

The methods of data collecting will include audio recording, online calls, and email interviews. All information supplied will be confidential. The research will have exclusive access to all acquired data.

Time

Approximately 30 and 40 minutes will take per participant.

Participant's rights

You have the right to stop this research anytime and without cause.

You are free to omit or decline to respond to any questions posed during the interview. Any or all of the information you supply may be removed from this dissertation before submission. Following the completion of the dissertation, a summary will be made available. Before beginning the data collection, you can ask the researcher any questions about this information sheet.

If you have any questions about this dissertation I am glad to answer. You can contact me via my e-mail which you can see below.

X20227299@ncirl.ie

Informed Consent Form

Research Title

The dissertation consists of the future target of renewable energy in Ireland. The study will explain Irish renewable energy sources, targets, affection of covid-19 and EU renewable energy targets by 2030 and 2050.

Invitation to participate by e-mail

Dear x,

Date

My name is Dilan Ozen. I am studying International Business at the National College of Ireland. I am about to finish my master's programme. I would be appreciated it if you could help and support my dissertation.

My dissertation is titled "What are the main future targets and prospects of renewable energy in Ireland? "

Audio recording, in-person interviews, and email interviews are some of the data collection techniques.

I've been getting in touch with people who operate in the Irish renewable energy sector. I want to interview you. The questions are on a list and won't take more than 40 minutes. Please accept my invitation.

Please don't hesitate to get in touch with me if you need or would like more details about my study topic before deciding to participate.

Kind regards

Dilan Ozen

Chapter 4: Finding and Data Analysis

This part will answer questions about renewable energy we have seen and examined in other chapters. This part is very important to understand and exemplify what we have read. The interviews will illustrate that potential and plans for renewable energy targets in Ireland will be examined.

The interviews will be face-to-face, by email or through individual calls. It will depend on the participant's schedule and requests. The questions are already prepared and covered the research topic. Individual calls and face-to-face meetings will be recorded. All this information is given to the participants.

A dissertation's most important chapters aid the researcher in interpreting the research using secondary sources, such as academic articles. Given that the primary goal of a dissertation is to respond to the research question, the research question is addressed through data analysis. Thematic data analysis has been done in the next part to answer the research problem.

Sampling part

The sampling part decided on the target population. Finding a participant part was quite tough and challenging. However, I contacted by email or on LinkedIn and asked to participate in the study. Interviews were done based on the professionals' responses who agreed to participate in this study. Below is a display of the self-selected sample:

Profile of Participants

Participant	Name of the company	Age	Gender	Years of the experience
Participant 1	Eirgroup	32	Male	5 years
Participant 2	Mainsteam Power -1	25	Male	Less than one year
Participant 3-4	KRA Renewables	28/36	Male/Male	2 years / 6 years
Participant 5	PM Group	31	Female	5 years
Participant 6	Sustainable Energy Authority of Ireland	33	Male	7 years

Research question 1: What are Ireland's plans for current renewable energy and future potential in 2030?

Participant 1: EirGrid's primary motivation is to deliver a cleaner energy future for generations to come, which all begins with the efforts we make now in reducing conventional thermal generation and increasing renewable sources of electricity. The roadmap describing the means by which we hope to achieve this is detailed in the Shaping Our Electricity Future document. All efforts within the company are aimed at creating a stable and secure grid which provides as clean energy as possible to all on the Island of Ireland.

Participant 2: did not answer this question

Participants 3-4: Participants 3 and 4 discussed about more wind energy. They agreed that the interviewee indicated that "wind is only present 33% of the time, is intermittent, and is very difficult to control. The main challenges raised were technology-related problems, such as controlling wind batteries and a lack of sufficient land. Ireland must make significant R&D investments if it wants to increase the proportion of wind energy in the system". Also interview 4 added that "Ireland needs to upgrade its infrastructure, network, and connections to Europe." Interview 3 said "Ireland has suggested setting 5-year carbon budgets that align with 2030 carbon emission reduction goals of 51%. Europe is setting new goals for 2030 on a global scale, and technical specifications and reporting requirements have been agreed."

Participant 5: Mentioned wave technology and biomass (renewable gas/biofuel). The government's tariffs and carbon tax on fossil fuels are some obstacles. They must encourage development and promote wider usage of renewable energy sources.

Participant 6: By 2030, Ireland must have at least 16% of its energy production be green and sustainable. Ireland understood that its access to fossil fuels would not last forever, and the global energy market is shifting away from the use of non-renewable energy sources. Ireland is required to satisfy the EU's renewable energy goals because it is a member of the EU.

Research question 2: How were COVID-19 impacts on 2020 energy data?

Participant 1: "The hold placed on construction work had quite a negative impact on the delivery of renewable generation projects, as well as the maintenance of conventional generators." Participant 1 mentioned about beginning of the covid 19 how affected their projects.

Participant 2: Clean, dependable, convenient, and affordable energy is provided through renewable energy solutions for critical services, including healthcare, water, and food supply. They are therefore essential to the quick response to Covid-19. Renewable energy must also play a crucial part in economic recovery, assuring sustainability and energy security, fostering job growth, and boosting resilience. Compared to the other industries can have the same effect while lowering emissions contributing to global warming.

Participants 3-4: Participants 3 and 4 agreed that 'the covid had generally affected the industry. It did affect us to restrict visiting our project in the field during the lockdown. Therefore sometimes, some problems are challenging to solve. But nothing was measured for us.'

Participant 5: At the NISO/NISG All Ireland Occupational Safety Awards 2020, PM Group was honoured to receive the Supreme Safety Award, making history the first company to take home the highest honour two years in a row. During this challenging year, our company did not affect so much compare to the other companies.

Participant 6: During the COVID-19 crisis, spending on energy efficiency is drastically decreasing. Investments in efficiency and end-use applications are anticipated to decline by 10-15% in 2020.

Also, lockdown procedures dramatically decreased electricity demand, which impacted the mix of energy sources. Every month of complete lockdown reduced need by 20% on average or more than 1.5% annually since decreases in commercial and industrial operations have far outpaced increases in residential demand. Because their output is generally unaffected by the order, renewable energy

sources have made up a higher portion of the electrical supply due to lower demand for electricity from all other sources which are coal, gas, and nuclear power.

Research question 3: What are Ireland's most significant obstacles in meeting the renewable energy targets, which are heat, energy and transport sectors?

Participant 1: undoubtedly the electrification of heat and transport will call for a blended mix of renewable technologies to meet increased demand. Increased penetration of solar will play a partial role (last RESS auction), along with hydro and biomass. The dominant contributor of renewable electricity generation will be wind, specifically offshore. If the ambitious target of 5GW offshore is met by 2030, coupled with onshore generation and other planned RES projects, Ireland may be in the fortunate position of being a net exporter of electricity. This will be facilitated by interconnection with mainland Europe (Celtic interconnector to France) and to Great Britain (EWIC & Moyle interconnectors)

Participant 2: According to interviewee 2, people depend on solid fuel or gas, and changing it can be costly. Other than district heating, the difficulties can be resolved using heating pumps, renewable energy incentives, tax breaks or additional grants, and updated building codes. "I believe the heat will get better, but it will take time." The 2020 targets reached their transportation-related goals, but they could not meet their overall goals, heating goals, or even electricity goals.

Participants 3-4: Interview 3 discussed planning, federal wind energy regulations, offshore grid policy development, and integrating renewable electricity into the grid as problems. Interviewee 4 said about electricity goals for that to achieve future goals, "the DS3 program needed to be continued past 2030". *DS3: The DS3 program's goal was to go up the quantity of Ireland's electrical grid now uses renewable energy safely and securely to satisfy Ireland's 2020 electricity targets.*

Participant 5: The interview mentioned that there is still a long way to go in-store technology, not just for Ireland but for a 100% renewable grid worldwide.

Although Ireland may not have fallen short of its goals in the electrical industry, it is doubtful that changes in the transportation and heating industries will occur rapidly enough. Interviewee 5 also thinks that the Government will be required to pay the fine or buy credits.

Participant 6: Ireland "is expected to be between 13 and 15% of the 17% target," according interviewee 6. Ireland is making every effort to achieve its goals.(not too much information about)

Research question 4: What are the biggest obstacles to effectively and securely incorporating further use of green energy in the power sector?

Interview 1: The technical challenges include voltage control, frequency control, signal telecoms, a more robust transmission and distribution system that allows the transfer of electricity from more of these generation sites etc. (no point building these projects if the current underground cables and overhead lines can handle the increased load). There are also market challenges that ensure fair trading and opportunities for participants.

Interview 2: Energy derived from natural resources is referred to as renewable energy. Renewable energy has recently gained popularity and is now a primary source of energy production.

Interview 3-4: One of the primary problems with renewable energy is creating power using uncontrollable natural resources. In contrast, solar energy only generates electricity during the day and turns it off at night. Like other forms of energy, wind energy depends on the wind's existence; if the wind speed is insufficient, the turbine will not turn, producing any power that the grid can use. On the other hand, too much wind could damage the generator. Therefore, maintaining a delicate balance is critical to keep the electricity flowing continuously. The unpredictability of energy generation in renewable energy systems makes integration more challenging.

Interview 5: The demand for hydrogen is expected to increase fivefold by 2050, driven mainly by the transportation sectors of aircraft, shipping, and roads. By 2035, the hydrogen supply is likely to change from nearly 100% grey hydrogen to 60% clean hydrogen as costs come down and authorities encourage the use of hydrogen technologies.

- A. Infrastructure and supply chains,
- B. Technological improvement and manufacturing scale-up, and
- C. Political assistance and three significant enablers are required to promote the growth of the hydrogen economy.

Interview 6: Renewable energy sources are anticipated to dominate the mix of power generation in 2030, reaching 80–90% of the total. Due to their decreasing prices, solar and onshore wind are anticipated to account for most of the expansion. They will have accounted for 43% and 26% of generation, respectively, in 2030. Due to regulatory restrictions and governmental barriers, offshore wind is expected to remain confined to less than 7% of worldwide age, with the potential to increase if factors like land use still constrain onshore wind. Ireland's energy supply has become more efficient during the past few decades due to the construction of natural gas facilities with improved efficiency.

Chapter 5: Discussion

Heat/Transport and Electricity sector in Ireland

While discussing the difficulties in incorporating more renewable energy sources into the electricity industry. The literature review and the majority of participants were discussed

technical difficulties,

improved connectivity with Europe,

difficulties with planning and national wind energy policies,

storage capacity,

utilizing grid,

creating and introducing renewable electricity into the grid.(SEAI,2021)

- Ireland's ultimate energy consumption decreased by 9.6% in 2020, mostly as a result of COVID-19, with the transportation sector accounting for the majority of the decrease.
- Private vehicle energy use decreased by 21.4% in 2020, while airplane energy use decreased by 64.3%, partly due to public health travel limitations.
- The year that saw the most electricity use was 2020.
- In Ireland, the energy generated for end consumers in 2020 came from 42.1% of the time renewable sources.

Numerous complicated supply and demand issues, such as supply security, must be considered to operate the electricity system safely and effectively (Eirgrid Group, 2020). One of the participants also brought up demand-side management. Additionally, contributions from the transportation and heating industries and private investments.(SEAI, 2021).

The participants emphasized that more substantial infrastructure for distribution and transmission and system upgrades are required to address these problems. The participants and the literature evaluation referred to the renowned program DS3 as supporting the improvements needed for the electrical sector. (SEAI, 2021).

as one of the primary modifications needed in the renewable transportation industry which is electrification. (SEAI, 2021). Additionally, there should be improved infrastructure, train connections, and the original bus routes.

More than one member suggested making the switch to electric heating gradually. The switching cost is high for Irish citizens who rely on solid fuel or gas. Where gas is present, bioenergy has a

tough time competing. A problem in this market is also thought to be district heating, recycling industrial waste heat, tax incentives, and the new building code. One of the attendees said that energy must be cheap for the entire population without pricing anyone out of this market to overcome these obstacles.

The literature review illustrates some difficulties with storage capacity. Ireland's move to renewable energy relies on two important subjects which are public investment and private investment. Finally, it is critical to note in this section that the literature assessment and the interviewees predicted that Ireland would fall short of its goals. The estimated achievement is between 12.7% and 13.9%, according to SEAI (2018). Ireland will probably need to purchase statistical transfers from EU members who have surpassed their 2020 goals. Future energy goals will therefore be much more challenging and expensive.

In conclusion, there are numerous renewable energy initiatives. Some of them have been working and progressing in the field. However, we can plainly see that there are many obstacles and difficult circumstances in the sector when it comes to interviews.

An energy system based on renewable resources offers a rare chance to achieve climate goals while boosting economic growth, generating new job opportunities, and improving human well-being. This goal may be performed by moving to a renewable energy-based system, which will create new growth opportunities, raise incomes, add jobs, and improve the health and well-being of millions of people.

More than 24 million people would be employed in the renewable energy sector, the global gross domestic product (GDP) would rise by 1.1%, and welfare would grow by 3.7% if the share of renewables were doubled by 2030.

Although Ireland won't be able to meet its 2030 goals, it has made significant strides toward its energy efficiency and long-term renewable energy targets.

[Future Targets in Renewable Irish Energy](#)

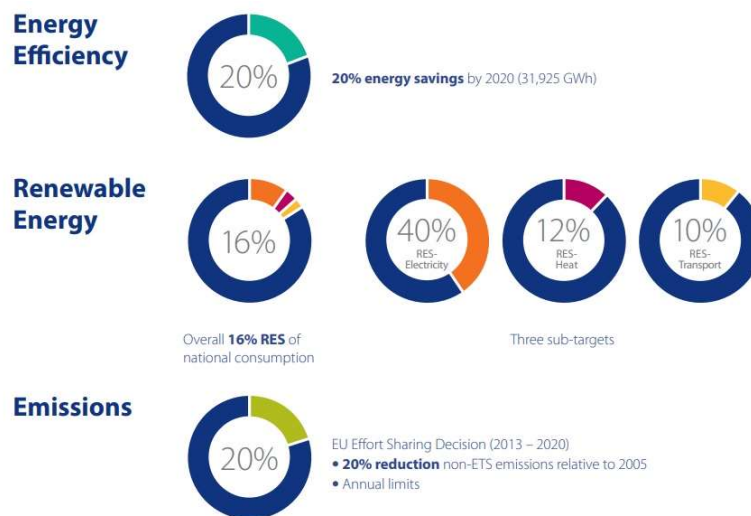
Among IEA members, Ireland had the second-highest proportion of wind-generated electricity in 2018.

Increasing domestic gas production and lowering the proportion of oil in the energy supply has also increased the security of its energy supply.

The interviews covered the necessary strategies to help Ireland reach its EU 2030 goals while also averting further shortages. The adoption of energy efficiency in homes and companies was the focus of the majority of participants and the literature study. The enlargement of existing policies, increasing national investment in the acceptance of renewable energy technology, innovation in the

grid, and a substantial reduction in carbon emissions in the energy sector, particularly in industrial and commercial settings.(Muenchmeyer, 2018).

Ireland's climate ambitions must be compatible with the structure of its economy. Energy infrastructure, including energy storage and management technologies, requires urgent private and public investment (Llado, 2018). The attendees also highlighted that Ireland must address its data centres, energy demand, and agriculture problems. Ireland will miss the goals, but thus far, the nation has made progress. Ireland can improve its efforts to meet the EU 2030 goals by studying its and other nations' achievements. Most participants thought Ireland should observe what other countries are doing, such as putting support programs for renewable technologies. The electrification of the transportation industry is demonstrated in Norway.



Ireland has benefited from business, the economy, and the environment due to the advancements made so far in applying energy efficiency and using renewable energy technologies. Ireland is becoming a nation that values sustainable energy (SEAI, 2021). Energy-related R&D is being encouraged, homes are becoming more energy-efficient, and communities and businesses are beginning to take an increased interest in energy transformation (SEAI, 2021). However, ongoing effort is required to reach future goals.

Ireland can serve as a model for the deployment of renewable energy technologies. With the DS3 program, participants in all of the researcher's interviews concurred that Ireland is already a global leader in producing renewable energy and has the potential to be one in the heat and transportation sectors. Most participants once more discussed the need for better European connectivity, technical

difficulties, various renewable supplies, a cautious transition to renewables, and storage concerning Ireland. Another time, the DS3 program was cited as a proponent of avoiding the trap.

Chapter 6: Conclusion

This dissertation's main topic was the challenges and future targets Ireland encountered in achieving its EU 2030 goals. Goals for renewable energy are based on a portion of end-use demand. This indicates that achieving renewable energy goals depends heavily on energy efficiency measures that lower overall market. From a detailed examination of the primary and secondary data, Ireland needs to improve its incentives to encourage the growth of renewable resources across all industries. The penetration of renewable energy in the transportation, heating, and electrical sectors must rise.

It illustrates that 2020 Ireland's future target below. Unfortunately, Ireland could not achieve their targets. Therefore, 2030 is a great opportunity to improve their missing parts. Ireland slightly missed meeting its renewable energy objective for electricity in the EU 2020 but met its renewable energy target for transportation.

Target	Progress Towards Targets								Target 2020
	2005	2010	2015	2016	2017	2018	2019	2020	
RES-E (normalised)	7.2%	15.6%	25.7%	27.1%	30.3%	33.3%	36.5%	39.1%	40%
RES-T (weighted)	0%	2.5%	5.9%	5.2%	7.5%	7.2%	8.9%	10.2%	10%
RES-H	3.4%	4.3%	6.2%	6.2%	6.6%	6.4%	6.3%	6.3%	12%
Overall RES	2.8%	5.7%	9.0%	9.2%	10.5%	10.9%	12.0%	13.5%	16%

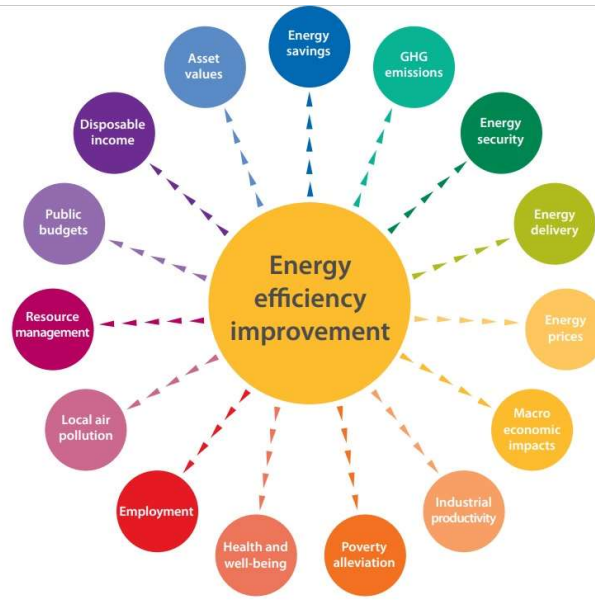
Figure 15: SEAI,2021

By 2030, the Climate Action Plan wants up to 80% of all electricity to come from renewable sources.

- Irish wind energy is eager to take on the task.
- According to the Irish Wind Energy Association (IWEA), by 2030, 70% of Ireland's electricity will come from renewable sources.
- Wind Power Ireland asserted that, when Denmark's significant share of offshore wind is taken into account (about 47%), Ireland is the world leader in onshore wind.
- Increase global effort and cooperation to hasten the implementation of renewable energy in line with sustainability and climate change goals. COVID-19 has influenced the world, and in the months and years to come, developing countries could be hit disproportionately hard. There needs to be more cooperation between governments and the global community. Long-term stimulus programs may aggregate investment from public and private sources to

de-risk projects and provide access to financing for both centralized and decentralized renewable energy.

- The achievement of the renewable energy objective will depend on the creation of alternative financing methods to increase the rate of energy efficiency retrofitting of homes and businesses, as well as the continuous implementation of an Energy Efficiency Obligation on energy suppliers.



Future scope

Despite its location and the economic crisis in Ireland, renewable energy is in an excellent position in the energy sector. Despite its strong competitors in the European market, it has made significant progress. Ireland has made a remarkable recovery from the economic crisis that began in 2008. Since 2014, when GDP surpassed pre-crisis levels, Ireland's economy has multiplied in IEA countries. Although energy consumption has increased along with GDP growth, it is still below its peak in 2006, partially reflecting the economic structural change toward the services sector's dominance.

Renewable energy should be more important in electricity, heating, and transportation. The government should pay more attention to the more robust Irish economy for a healthier future and the world. The offshore wind might play a sizable role in Ireland's future energy renewables mix given the east coast's demand for electricity, the potential for grid connection, and shallow sea.

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