



## THE EUROPEAN GREEN DEAL: ARE GREEN ALTERNATIVES RELIABLE?

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**Abstract** : The European Green Deal embodies an audacious and all-encompassing vision for the European Union to tackle urgent environmental issues, counteract climate change, and foster sustainable growth. Renewable energy sources, including wind, solar, and hydropower, have become increasingly prominent. Renewable energy sources have exceeded the use of solid fossil fuels in their contribution to the overall energy supply in recent years. The European Union must devise a strategy to eliminate its most significant sources of pollution. This paper seeks to tackle the persistent energy issue by guaranteeing a smooth and effective transition to clean and efficient energy sources. The process entails expanding the range of energy sources, enhancing the grid infrastructure, and advocating for energy efficiency. In the last paragraph, it will be examined a potential course of action for executing the European Green Deal. Some of present suggestions include allocating funds towards renewable energy, enhancing the efficiency of public transit, and investing in education.

**Key words** : Long-term solutions, pollution, renewable, resolution, responsibility, sustainability .

### 1. INTRODUCTION

The European Union aspires to achieve carbon neutrality and become the world's first continent to do so by the year 2050. This ambitious objective entails attaining a state where there are no net emissions of greenhouse gases. The EU aims to take a leading role in the global effort to combat climate change by giving priority to sustainable energy sources and lowering emissions.

The Green Deal aims to transition towards a contemporary, resource-efficient, and competitive economy. The EU seeks to provide fresh economic prospects while protecting the environment by adopting sustainable practices. The shift towards a more environmentally friendly future must encompass and involve everyone. The Green Deal prioritizes the principle that every individual and area should get equal attention and support. The success of the project relies on the inclusion of social fairness, job creation, and community well-being.

The European Green Deal is a bold and ambitious plan for a climate-resilient Europe. To completely understand this innovative project, one must understand its background and worldwide contexts. Recalling a 1997 Japanese summit helps explain the European Green Deal. After intense campaigning by environmental groups, most industrialized nations joined the Kyoto agreement, the first carbon reduction plan. Russia, Japan, the US, Canada, and Australia were annex one countries, along with the EU. These countries were forced to

reduce carbon emissions as large CO2 emitters. Between 2000 and 2017, European CO2 emissions fell 20%. Europe was the only signatory to meet agreement standards. Europe's industrial industry moved abroad, contributing to this. The party has met its responsibilities, yet the agreement's reductions are insufficient. The climate summit had less impact as global temperature and CO2 emissions rose and a global solution seemed impossible. After lengthy talks, the world community approved the Paris climate agreement in 2015, promising to keep global warming below two degrees Celsius. Even if the French president who hosted the event and the UN secretary general praised them, their agreement had no legal requirements. The world's biggest polluters were expected to cut emissions freely. The EU has progressed despite various countries' shifting promises. The organization pledged carbon neutrality by 2050. They initially pledged 40% emissions reduction by 2030, then 55%. The 2019 European Green Deal focuses on decarbonizing and digitalizing Europe's economy. The European Commission president called the pact Europe's "man on the moon moment," a major achievement. However, the contract is not law. Instead, Europe needs a clear plan and laws to be sustainable. The European Commission presented strategic papers on food production, biodiversity conservation, and industrial and digitalization policy, all key elements of the green accord. This initiative seeks 1 trillion euros for the transformation. Thus, it is the largest global environmental project. This money may not be enough, as projections show the EU may need up to 2.8 trillion

euros to cover the shift. Despite your expenditure commitment, not all pledged funds come from the EU. Approximately 50% will come from EU funding. The remaining cash will come from its Green Deal-inspired strategy to mobilize private and national resources by creating new business opportunities. The European Green Deal adds regulations to existing laws and procedures to promote the environmental transition, rather than changing them

## 2. THE EXISTING SOURCES IN EUROPE

Before analysing the potential solution for a sustainable European Union, it is necessary to examine the available sources. An overview of energy production sources within the European Union will be provided [1]:

1. *Nuclear Energy*: The primary source of electricity generation in the European Union is nuclear power facilities. They contributed an estimated 613 terawatt-hours, or roughly 20%, to the total power generated in 2022. France is the primary contributor to the European Union's nuclear power production, which will account for over fifty percent of the region's total output in 2021. Sweden, Germany, and Spain were also significant producers during that year. Notwithstanding its status as the primary electricity provider, nuclear power generation in the European Union (EU) has exhibited a predominantly declining trajectory for over ten years. Numerous nations, including Germany, have made firm commitments to decommission their remaining reactors by April 2023.

2. *Natural gas* : In 2022, the European Union generated 558 terawatt-hours of gas, which was second only to nuclear energy. Norway is a substantial gas supplier to the European Union, accounting for nearly 30% of the total gas imports in 2023. 2. United States: An additional significant supplier, the United States accounted for 19% of the overall gas imports during the corresponding year. Further gas suppliers consist of Qatar, the United Kingdom, and North African nations. By contributing to the EU's gas supply, these nations reduce reliance on Russian fossil fuels and ensure diversification.

3. *Renewable Energies*: Wind power constituted the most substantial contributor, generating an estimated 421 terawatt-hours during the corresponding year. Other renewable energy sources, including biomass, hydroelectricity, and solar, also make substantial contributions to the energy composition of the European Union.

4. *Solid Fossil Fuels*: Despite a gradual decline, solid fossil fuels constituted 15.2% of primary energy production in the EU in 2021. However, as a result of environmental concerns and initiatives to transition to cleaner energy sources, their share has been declining.

5. *Fuels derived from petroleum and oil*: In 2021, fuels derived from petroleum and oil accounted for 3.4% of the EU's primary energy production. In spite of a

sustained decline over an extended period, oil continues to be a substantial power source. Notwithstanding variations in output and utilization, crude oil and petroleum products remain significant contributors to the energy composition of the European Union. In 2022, the European Union's reliance on imported crude oil and petroleum products peaked at an all-time high of 97.7%. Ongoing endeavours are being made to improve energy security and decrease dependence on particular suppliers.

6. *Non-Renewable refuse*: In 2021, 2.3% of primary energy production in the EU was derived from non-renewable refuse.

7. *Nuclear Heat*: In addition to generating electricity, nuclear energy will account for 31.2% of primary energy production in the EU in 2021 in the form of heat

Let's start with the EU's biggest polluters before considering the Green Deal. Estimated EU carbon dioxide emissions in 2022 were 2.73 billion metric tons. This was a little drop from the previous year's 2.74 Gt CO<sub>2</sub>. CO<sub>2</sub> emissions peaked in 1979 at 3.99 billion metric tons in the EU. A considerable decrease in CO<sub>2</sub> emissions was seen from 1979 to 2022.

Germany has continuously had the highest EU carbon dioxide emissions since the 21st century. In 2022, Germany emitted 35 million metric tons of carbon dioxide, surpassing Italy and Poland's combined emissions.

Two major polluters exist in the EU:

1. *Coal Power Emissions*:

Coal dominates the European Union's power sector emissions by a significant margin. Coal-fired power stations contributed to over 60% of the total emissions in the power sector in 2022, emitting 457 Mt CO<sub>2</sub>. Since 2015, however, EU coal power emissions have decreased by approximately 36% due to the closure of coal facilities in an increasing number of countries. [2]

2. *Transportation* [2] :

A fifth of EU emissions come from road transport. Passenger transportation modes emit different amounts of CO<sub>2</sub>. Passenger vehicles emit 61% of EU road transport CO<sub>2</sub>.

The average European car occupancy rate in 2018 was 1.6 people. Increasing public transportation, cycling, walking, and vehicle sharing could reduce pollution.

We must decide if electric cars are greener. Car CO<sub>2</sub> emissions can be lowered by increasing fuel economy or switching fuels. Diesel powered 67% of European road transport vehicles in 2019, followed by gasoline 25%.

Electric vehicles accounted for 17.8% of newly registered passenger vehicles in 2021, up from 10.7% in 2020.

Sales of plug-in hybrid and battery electric vehicles have skyrocketed since 2017. These sales tripled by 2020, when CO<sub>2</sub> targets took effect.

In 2021, 3.1% of the market share for newly registered vans was comprised of electric vans. When

quantifying the carbon dioxide (CO<sub>2</sub>) output of a vehicle, it is necessary to consider not only the CO<sub>2</sub> emissions generated during operation but also those resulting from its manufacturing and disposal processes.

3. The environmental impact of electric vehicle production and disposal is comparatively lower than that of internal combustion engine vehicles. Furthermore, the extent of emissions emitted by electric vehicles is contingent upon the specific method employed for electricity generation.

4. With the average energy balance in Europe, however, electric vehicles are already demonstrating their environmental friendliness in comparison to gasoline-powered vehicles. Future growth in the proportion of electricity derived from renewable sources should contribute to the environmental friendliness of electric vehicles, particularly in light of EU initiatives to develop more sustainable batteries.

### 3. EXPERIMENTAL RESEARCHES

- *Hypothesis*

The idea of this experiment is to see what policies and what investments we can make to accomplish the European Green Deal objectives. We know the budget, the main energy producers and the biggest polluters, we have 26 years to achieve carbon neutrality.

- *Some successful examples*

The first thing I will address is the energy production sector and I will like to analyse the case of Germany, they shut down their last nuclear plant in April 2023 and still manage to increase the percent of produced renewable energy. Mostly doing that by using wind energy, that being the cheapest and most efficient way to produce renewable energy.

#### 3.1 *The energy problem:*

##### 3.1.1 *Wind plants and solar energy*

The European Wind Energy Association (now Wind Europe) has estimated that by producing 230 terawatt-hours using wind energy which is 14-17% of the EU's electricity, will avoid 333 million tonnes of CO<sub>2</sub> per year and saving Europe €28 billion [3] a year in fuel costs. That was a projection for the year 2020. That can be reinvested in more Wind plants. Only 7 countries from the EU are above the average number of wind plants installed, leaving a lot of room for improvement. In the last 2 years, were installed 16.000 wind plants per years, One wind plant, given the average capacity factor for small wind turbines, a 10 kW turbine will produce roughly 14,892 kWh per year [4], multiplying that number with 16000 we will obtain 227.6 TWh, or about 7-10% of all European energy consumption. A 10 kW turbine cost between 4-8 million euros [5], summing up to a total 96 billion euros. That kind of investments cannot be supported on the long term given our projected

budget, but from the 28 billion we can spend them on building more wind plants. Till 2050 we will have a 91.000 more than in the present, or around 45% more. Reaching a total of 1291 TWh, almost 35% of the present EU demand.

Those renewable energies can replace the coal mines especially, taking into consideration that coal mines are the biggest polluters, with countries like Germany, Italy and Poland being at the forefront. Italy having only 12000 wind plants compared with Germany's 70000 and Poland having only 9000.[6]

##### 3.1.2 *Solar panels*

The installed solar photovoltaic (PV) capacity in the European Union was projected to exceed 158 GW in 2021. As of 2023, the solar generation capacity of the European Union was estimated to have substantially increased to 259.99 GW. Although not a significant industrial energy producer, solar energy is exceptionally efficient for residential use. Governments may provide subsidies for residential solar panel installation. Hydro run of river.

Pure generation plants produced 348 TWh of electricity in the EU27, and pumped storage plants contributed 27 TWh. When including the broader region, the total generation from pure generation plants increases to 605 TWh, and pumped storage plants provide 30 TWh [7].

Adding the energy from wind plants, nuclear plants and hydro plants we will add up to a total of 2500 TWh from renewable sources and around 85% of EU total need [8]. The cost of this will be around 200 billion euros.

##### 3.2 *Transportation:*

Another area where is place for improvements its in transportations, one fifth of the pollution being cause by it. As we can see from the statistics presented before, personals cars, most of them being for transportation within the city. Lucky for us, most of with can be replaced with a more efficient public transportation. In order for us to succeed implementing such strategies we will have to invest heavily in this area. One way to start will be to start to subsidize a part of public transport subscription for students and people who work in the respective city. In addition we can develop infrastructure for bicycles, such as the Netherlands did.

Car manufacturer have to respect the regulations for their car engines, which states that the carbon emissions of each engine should be reduced.

Also, the EU can start developing some biofuels, in the world already being some prototypes, after more research hopefully the technologies will become cheaper.

It's almost impossible to estimate the costs of this transformation, but is safe to say that will be around 250 billion euros.



### 3.3 Education and reforestation:

An educated population is crucial for the successful implementation of any policy. With 26 years until 2050, an entire generation will have passed from birth to adulthood. While many eastern countries have already adopted such policies, it is not too late for the eastern part of the union to do the same.

Promotion should focus on three key aspects:

- the significance of recycling ;
- the utilization of public transportation [7], [8], [9];
- efforts to construct houses and ships using renewable energies that are as sustainable as possible.[10]

Finally, it is very important to pointed the reaction of CO<sub>2</sub> emissions on forest - EU plans to plant 3.000.000.000 trees by 2030, which are mean to capture the carbon dioxide. More than that, the EU can organize summer camps, workshops and many more activities, designed for students, to educate them about climate change and how they can help. During those camps, they can plant trees, collect unrecycled plastic and many more activities.

The cost of this policies will be reduced compared to the first two parts, summing up to a total of 50 billion euros.

## 4. CONCLUSIONS

In conclusion, the European Green Deal represents a holistic approach to sustainability, emphasizing both environmental protection and economic prosperity. By implementing its action plan, the EU can pave the way toward a greener, more resilient future . The project is ambitious, but also possible.

The European Green Deal consists of a package of policy initiatives, which set the EU on the path to a green transition, with the ultimate goal of reaching climate neutrality by 2050.

Human activity is causing an increase in the average global temperature which is impacting climate patterns. More frequent and stronger extreme weather events have devastating consequences on lives and the economy.

In period 2013-2023, +1.22 °C was the increase in global average temperature. Approximate, 80 % of people from Europe are in poor conditions.

If we continue using resources as we do today, will be needed 3 planets to 2050.

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