**COMMITTEE:** G20

**TOPIC:** Encouraging a global transition towards renewable energy

**MEMBER OF THE ETAT MAJOR:** Konstantis Kosmidis

**POSITION:** President

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## Personal Introduction

Dear delegates,

My name is Konstantis Kosmidis, I am 17 years old and a student in the LFHED Hellenic Section, and I will be your president for this year's LFH MUN session. By my side, as this committee's vice-president is going to be Mayaud Quitterie.

I hope that this study guide will help you get a grasp on the topic and equip you with important information for our debates to come.

All three subjects chosen are very interesting. The global transition to a greener future, the economical background of it as well as the impact of AI to our lives will give you the opportunity to deep dive into real world issues, as well as offer you an understanding of how the world of diplomacy goes about making decisions that impact the lives of all of us. I am sure that these subjects will spark your interest in our world's actuality.

During the sessions remember to be open to talking and making acquaintances with others, an indispensable skill a diplomat must possess to make a lasting impact. The whole conference is based on forming alliances while discussing pressing issues with other delegates. Teamwork plays an important role during the preparation for the debates, and it also gives all of you the opportunity to meet new friends and make plenty of good memories.

I remember my first time receiving an email with a 30-page Word document filled with words I had never seen before and lines and lines of what seemed like jargon, and it is safe to say I was quite terrified, but do not worry. The MUN is an amazing project. It is a platform for all of us to develop many important skills, socialize and look back to as a set of fond memories. We truly believe that you will all find an interest in this topic and in turn encourage us to have productive conversations and fruitful debating sessions.

Looking forward to meeting all of you!

## Introduction

The transition to renewable energy really started picking up in the late 20$^{th}$ century. Up until that point, our sources of energy and the economy solely depended on fossil fuels. Advancements in the domains of science and technology helped scientists better understand the actual impact of burning fossil fuels, and with that also came public pressure towards governments and institutions for policies that would help lead the world away from ‘’dirty’’ energy sources.

In today's world, a transition to a greener future is not just an option, but a critical move we must make to better our lives. Global politics and conflicts threaten the energy security and economy of many countries, issues that would be resolved if all nations fulfilled their energy consummation locally and in an eco-friendly manner. Furthermore, such a transition promises climate protection and health benefits.

The global energy landscape is undergoing a critical transformation as nations seek to reduce their dependence on fossil fuels and transition to renewable energy sources. Fuelled by a worldwide change in attitude towards the environment, ongoing global conflicts as well as a fast-approaching AI based future, it is safe to say that the topic of the environment is a pressing world issue that cannot be ignored for much longer. Advancements in the fields of technology, biology, physics have given governments around the world the opportunity to directly combat and overcome the issue, but few seem to utilise them to their full potential good. Renewable energy sources -solar, wind, hydro and geothermal power- offer a sustainable alternative to traditional, highly polluting, energy sources such as coal, oil and natural gas. However, the adoption of new environmental technologies varies by country, with many having to combat economic and political challenges that occupy a larger attention of their time.

International organizations like the United Nations (UN), the International Renewable Energy Agency (IRENA), and the International Energy Agency (IEA) play a crucial role in guiding this transition, in influencing countries green trajectories. The UN Sustainable Development Goal (SDG) 7 specifically calls for "affordable, reliable, sustainable, and modern energy for all" by 2030, emphasizing the need for investment funding in renewable energy projects and innovative solutions to expand energy access efficiently. The private sector has also played a major role in advancing the global energy transition. Companies such as Tesla, Siemens, Ørsted, Vestas, and NextEra Energy have invested billions in developing cutting-edge renewable energy technologies such as solar roof tiles, electric vehicles, offshore wind turbines and AI based energy management software. Meanwhile, energy giants like BP, Shell, and TotalEnergies, traditionally known for their role in the fossil fuel industry, have pledged to shift toward cleaner energy alternatives by investing in wind and solar power. Amazon, Google, and Microsoft have also committed to running their global operations entirely on renewable energy, setting an example for other corporations to follow.

In order to directly address these issues, the necessity of intergovernmental cooperation is higher than ever. Corporations, international organizations and citizens must also ensure an equitable transition for all nations around the world.

While important steps have been made in many nations around the world, most states are facing many problems. Insufficient funds, lack of technological expertise, dated infrastructure and political agendas with the sole purpose of financial gain standing in the way of real progress. Encouraging a global transition to renewable energy requires forward thinking leaders, international cooperation and new policies

to support this shift from fossil fuels, while making sure that the lives of animal and human populations around the planet do not have to suffer.

## Definition of key words:

**Global energy landscape:** The overall state of energy production and consumption. Also including the transition to new sources of energy.

**Fossil fuels:** Coal, oil, natural gas and others that create pollution when consumed.

**Renewable energy:** Energy that comes from natural sources like the sun, wind, water, and heat from the Earth, and doesn't run out.

**Solar Power:** Energy derived from the sun. Usually captured by solar panels.

**Wind Power:** Usually captured by wind turbines.

**Hydropower:** Energy from flowing water like rivers or dams.

**Geothermal Power:** Energy derived from heat inside the Earth.

**International Renewable Energy Agency (IRENA):** A global organization that promotes renewable energy and helps countries switch to clean energy sources.

**International Energy Agency (IEA):** A global organization that provides data, policies, and guidance on energy use and production.

**Sustainable Development Goal (SDG) 7:** A United Nations goal to ensure everyone has access to clean, affordable, and reliable energy by 2030.

**Private sector:** Businesses and industries owned by individuals and not the government. In many cases, these corporations have much more influence than the central government.

**Intergovernmental cooperation:** When different governments work together.

**Insufficient funds:** Lack of financial support.

**Dated infrastructure:** Outdated facilities that no longer meet current demands and standards.

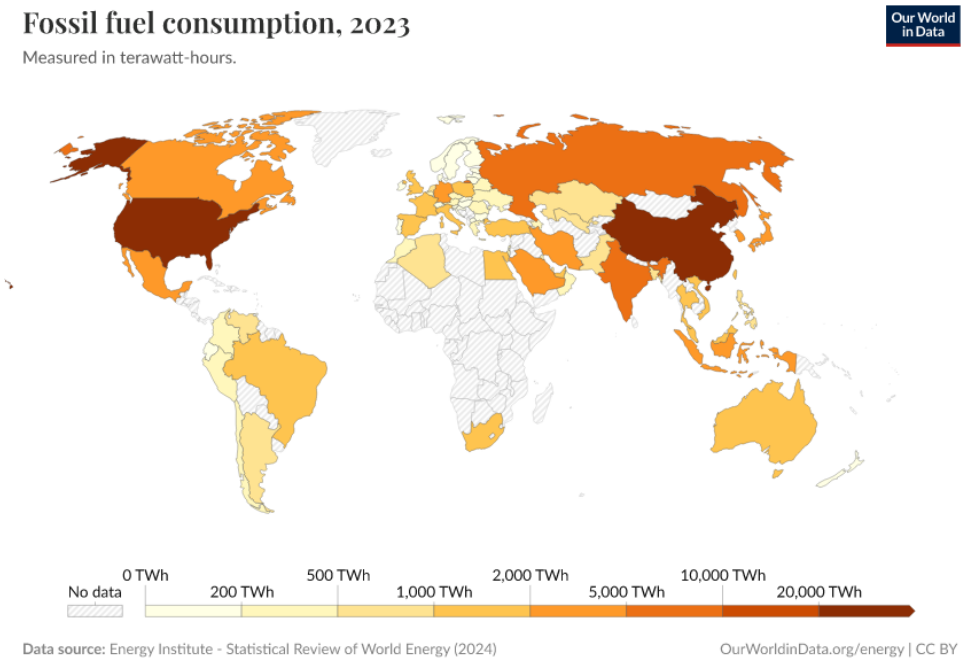
**Political agenda:** The goals and priorities of a government or a political party.

**Policies:** Rules and guidelines, or in some cases laws, created by governments for organizations and businesses in general to follow.

## General overview

## 1) The need for a global energy transition

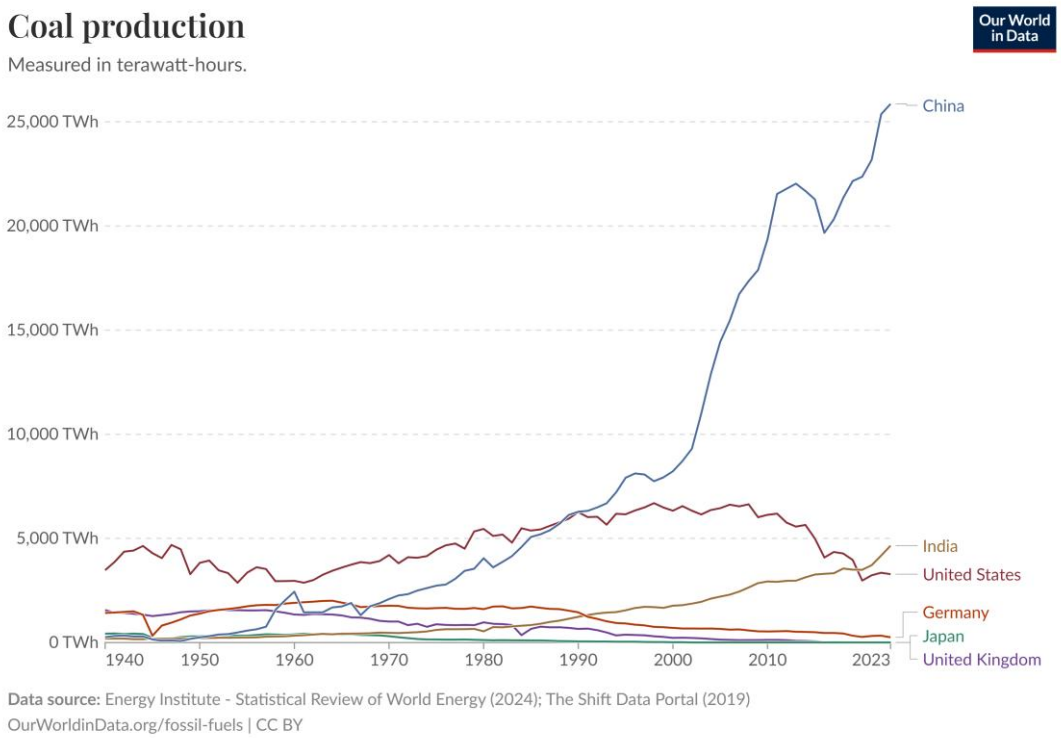
As highlighted in the previous part of the study guide, a global transition to renewable energy will play a fundamental role in shaping the future of our planet and of humanity itself. It is an indispensable step we must take to ameliorate our world for generations to come.




*This world map depicts fossil fuel consumption per country, helping you understand and visualise which are the regions of our planet that have high consumption indexes. (Source: Energy institute)*

**The negative impact to the climate, the environment and our health.**

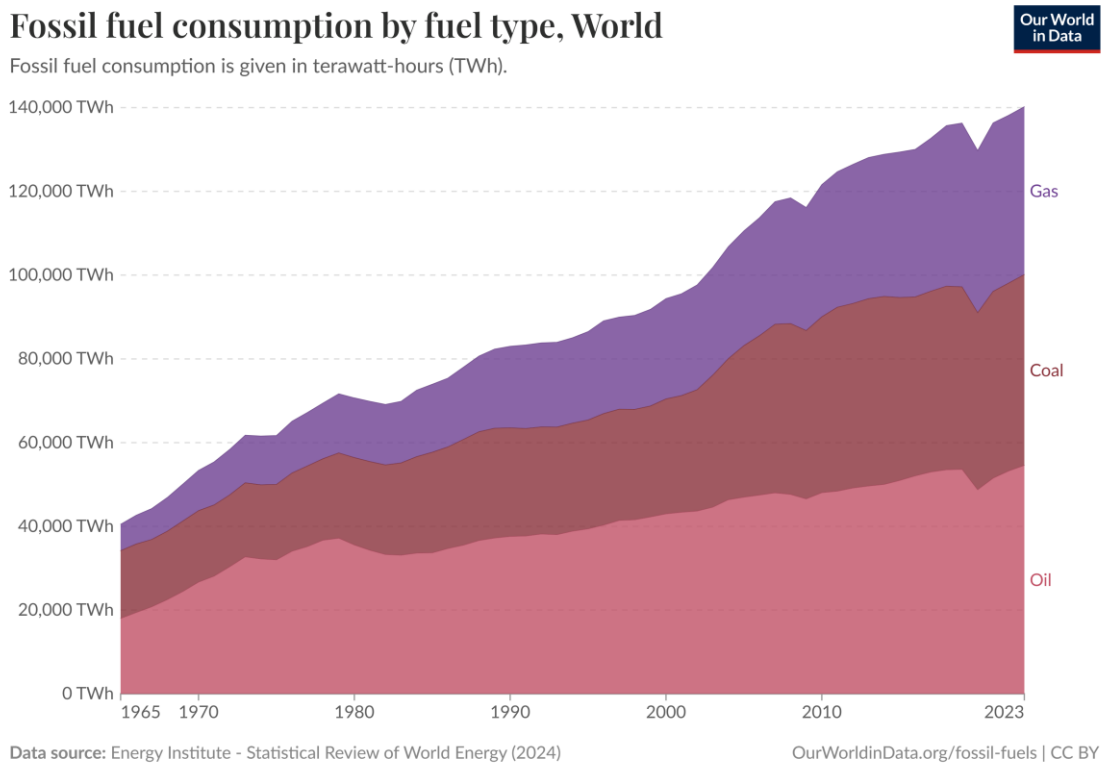
When we burn fossil fuels, they release harmful pollutants (such as $CO_2$, $SO_2$ and $CH_4$) into the air. Coal is the dirtiest fossil fuel responsible for 40% of global Carbon Dioxide emissions. Consequences of its consumption include health hazards like cancer and asthma, severe air pollution, with cities near vast coal plants experiencing high smog levels and environmental destruction like deforestation, water contamination and habitat loss created by the mining process. Even though countries are phasing out coal, some of the world's biggest economies such as the U.S., China, and India still heavily rely on it.




*This chart shows the rapid increase of coal production amongst the world's major nations. We can clearly see that China has had a drastic augmentation in their fossil fuel production. (Source: Energy Institute)*

Oil is the leading source of Urban air pollution. The main problems caused by its use evolve around the human health with asthma, different types of cancer and other diseases. It is mainly used for transportation and countries with heavy car dependency, like the U.S. and Saudi Arabia have air mainly polluted by its burning. Cities with massive traffic congestion, like Beijing, Los Angeles and New Delhi struggle with toxic smog and poor air quality.

While natural gas is considered ‘cleaner’ than oil and coal, it is far from a viable solution for our planet. Its consumption releases harmful chemicals to the air, and it also contributes to the ozone formation, with methane leaks trapping the heat in our planet. Viewed by many as a ‘transition fuel’, natural gas poses a problem to the task of moving away from fossil fuels towards renewable energy.

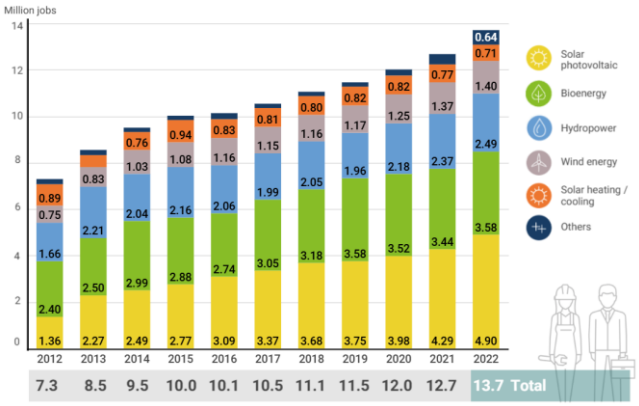


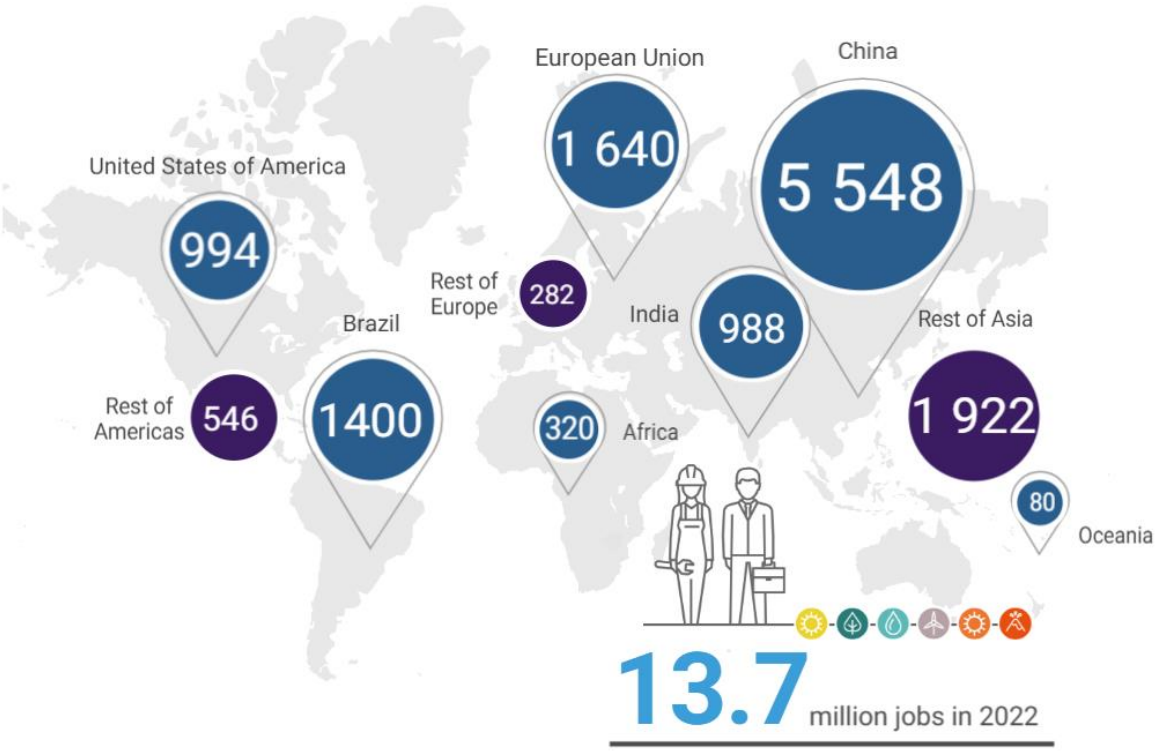

*Fossil fuel consumption disaggregated by type, making us understand that fossil fuel consumption keeps growing. (Energy Institute)*

**Socio-economic benefits of the transition towards renewable energy.**

Contrary to popular belief, this transition doesn't translate into a vast loss of jobs in exchange for a bet. While the job of minors, distributors and factory workers will diminish significantly, there will be many more posts that will need to be filled in sectors, such as the technological and innovations domains.In today's world, the renewable sector is a major job creator, employing over 13 million people globally, with that number expected to grow significantly in the years to come.

*Through this diagram we can see the increase of jobs in the renewable sector, especially in the domains of solar power, bioenergy and solar power. (Source: IRENA, International Renewable Energy Agency)*





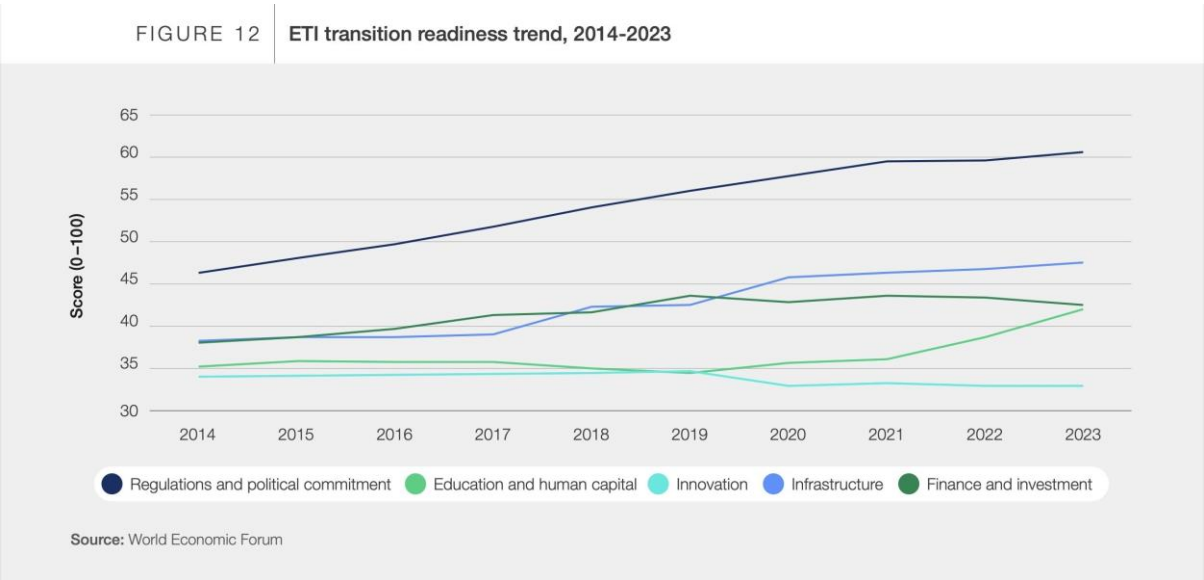

*China, the European Union and Brazil are among the world's top renewable energy employers. (Source IRENA)*

The global political landscape is drastically changing. The outcome of the pursuit for global dominance will be determined by the nation prepared militarily while simultaneously having the upper hand in the financial sector, and that is exactly where moving away from fossil fuels and closer to green energy will play a key role.

Countries that invest in renewables reduce their dependence on imported fuels, therefore limiting the influence of the outer world in their decisions. They enhance the security of both their energy supply and their economy. Over time, the citizens of said nations will also benefit from lower bills, since the operational costs for renewable energy will become cheaper than that of fossil fuels.

In a report conducted by the World Economic Forum it was said that ''Of the 120 countries benchmarked in the report's Energy Transition Index, 113 have made progress over the last decade, but only 55 have improved their scores in the Index by more than 10 percentage points.''. Fundamental for the energy transition to be kept on track is further investment in clean energy and the promotion of innovation in the sector.

This link will direct you to an article on renewable energy jobs by the World Economic Forum: https://www.weforum.org/stories/2023/10/irena-renewable-energy-jobs/




*Energy readiness trend 2014-2023: progress is being made but more investment is needed. (Source: World Economic Forum)*

**Meeting International Climate Goals**

Global collaboration is rudimentary for real progress in the transition towards renewable energy, and that is why there are agreements between nations.

- **The Paris Agreement - https://unfccc.int/process-and-meetings/the-paris-agreement**

Aims for limiting global temperature rise below 2°C. It is a legally binding international treaty, meaning that each state that is part of it must express its willingness to undertake the legal rights and obligations contained in the treaty. This agreement was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France in 2015, and entered into force a year later. In recent years, many world leaders have stressed the need for the target to be reconsidered to 1.5°C. The Paris Agreement is a landmark of multilateral cooperation.

In 2016 the U.S., the largest economies in the world, left the Paris Accord under the Trump administration. Later, in 2021 President Biden moved to finally rejoin the agreement, a decision that would ultimately be reversed shortly after President Trumps second inauguration. With a world leading country evading an important role in the Paris Agreement, progress has taken an important toll.

- **Sustainable Development Goals (SDGs), Goal 7 - https://sdgs.un.org/goals/goal7#overviewv**

The SDGs is a set of 17 goals, voted by the UN in 2015, with the purpose of ending poverty, ensuring peace and prosperity and protecting the planet. Goal 7 focuses on ‘Ensuring access to affordable, reliable, sustainable and modern energy for all by 2030.’. Without adherence to these agreements, achieving a move towards green energy won be achieved.

## 2) Current Efforts

Throughout the previous part we talked about the need for an energy transition, but what are some current efforts being made?

### Global Initiatives

As previously stated, multilateral cooperation is essential for a global transition to renewable energy. Taking this into consideration, several international organizations and agreements have been put into place, with the purpose of accelerating the transition.

- **The United Nations Framework Convention on Climate Change (UNFCCC) - https://unfccc.int/process-and-meetings/what-is-the-united-nations-framework-convention-on-climate-changeb**

Signed in 1992, UNFCCC is the foundational treaty that has provided a basis for international climate negotiations since it was established, including landmark agreements such as the Kyoto Protocol (1997) and the Paris Agreement (2015). The Convention has been ratified by 197 states who have committed to act on climate change and regularly report on their progress. The goal of the Convention is the 'stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'.

- **International Renewable Energy Agency (IRENA) - https://www.irena.org/**

IRENA is an intergovernmental organization tasked with facilitating global cooperation, making advancements in human knowledge and promoting and adopting the use of sustainable energy for all. 170 states and the European Union are members of the initiative. The agency acts as an official UN observer, meaning it gets to speak at General Assemblies and offer their input, but can't vote on resolutions.

- **Conference of the Parties (COP), U.N. - https://unfccc.int/process/bodies/supreme-bodies/conference-of-the-parties-cop**

COP is the annual United Nations climate summit where world leaders, scientists, activists, and negotiators come together to discuss and strengthen global efforts to tackle climate change. It is organized under the United Nations Framework Convention on Climate Change (UNFCCC).

## Technological Advancements

What inventions can facilitate the transition.

- **Smart Grids**

These networks utilise emerging technologies and innovations in order to respond to change. Using a two-way flow of data and electricity they gain the ability to detect patterns and react to energy consumption. These grids help combat unexpected issues and can be a ‘game-changer’ in our efforts of stopping energy waste. With the rapid advancements in the domain of Artificial Intelligence, endless possibilities have uncovered.

- **Battery Storage**

These devices allow us to store energy from renewables (wind, solar, hydropower) and release it when needed. Currently, lithium-ion batteries found in our phones and electric cars, are the dominant force in the industry. There are also plans for larger-scale models, able to power homes and factories, with companies starting to develop them. Battery storage technologies will play a pivotal role in our quest to move towards renewable energy since the directly tackle one of the biggest challenges we are faced with, producing and successfully storing green energy.

*Battery Energy Storage Systems (BESS) facility.*

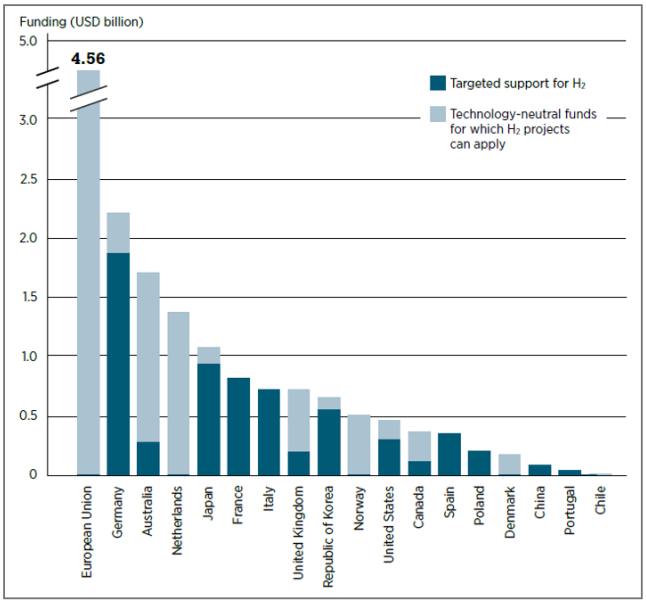
- **Green hydrogen**

Produced by the electrolysis of water, where electric current passes through a substance and breaks it down in its component parts, may be a solution for the future. Contrary to grey hydrogen which is derived from fossil fuels and has high carbon emissions, electrolysis uses renewable electricity, making the emissions of green hydrogen significantly lower. As of 2021 it accounted for less than 0.04% of global hydrogen production, since the cost of its production is multiple times that of grey hydrogen. Steps have been taken in the sector, decreasing the cost of green hydrogen production from 25 times that of hydrogen derived from fossil fuels in 2018 to 3x in 2024.

*The world's largest green hydrogen plant, Fukushima, Japan.*

**Average annual funding potentially available for hydrogen projects, 2021-2030**

IRENA
International Renewable Energy Agency




As of August 2021

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*Annual funding for green hydrogen projects. The financial resources are mostly available but not utilised or mismanaged (Source: World Economic Forum).*

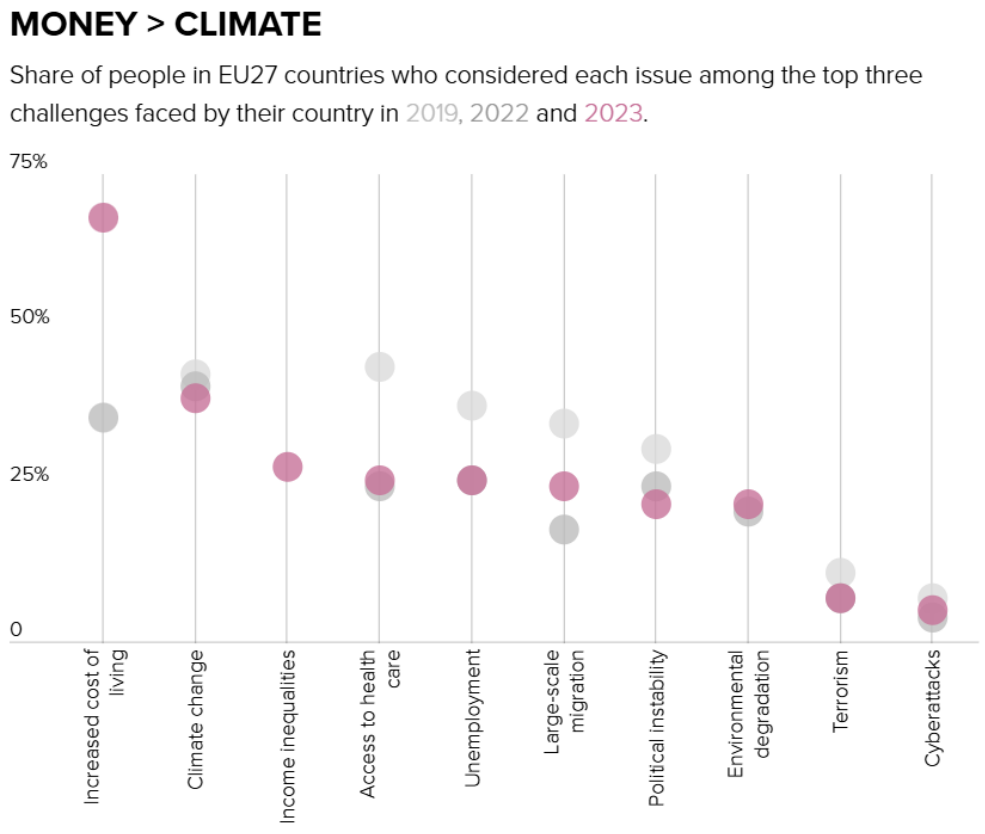
## 3) Challenges to Renewable Energy Transition

Despite making progress, the challenges we are faced with are still significant. If we want to achieve even the easier goals set by nations and organizations, there needs to be drastic change and mobilisation in the world stage.

### Political and Economic resistance

In the world of politics everything is a negotiation, even the future of our planet. Industry giants and political figures with the sole purpose of maximising profit no matter the cost are core problems we must face. Fossil fuel companies have significant influence in the global economy, slowing down or even ‘dropping’ policy changes around the world. The boards and executives of the energy industry will continue to hold on to the massive influence and power that they possess, no matter the risk impended by their stance.

On the other hand, world leaders can ignore environmental challenges for so long. The question is: Will human appetite for profit come before bettering the lives of billions of species on our planet.

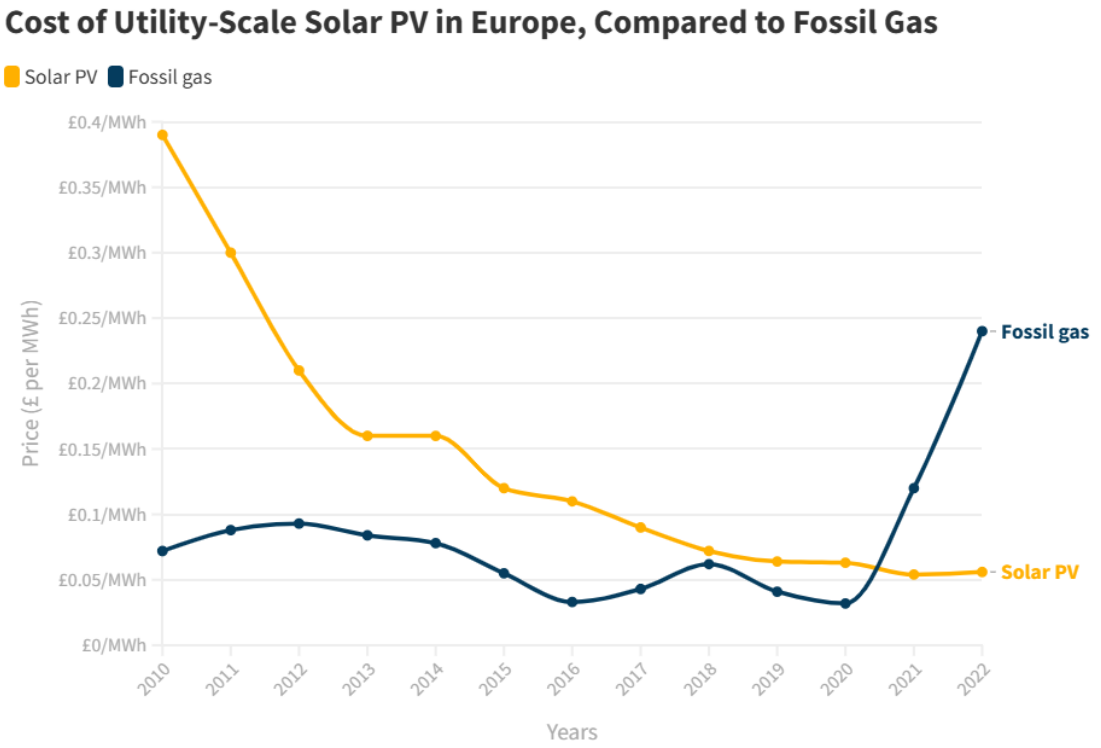



*Money is the core issue of European residents, with climate change concerns starting to decrease. (Source: Politico)*

- **High Initial Costs**

Even though, there has been a great deal of effort in many domains (cooperation, sensitisation, technology, research), there remains a glaring obstacle in the way to a green future and that is in the financial domain. A shift towards renewables comes with a greater cost than that of fossil fuel consumption. Many developing emerging nations struggle to afford large-scale renewable projects, and the world's leading economies will not jeopardise their place in the global stage by allocating funds towards this shift.

Researchers project that wind and solar will continue to get cheaper, falling further below coal and gas costs globally this decade. Overall, the renewable power deployed globally since 2000 has saved up to 409 billion USD in fuel costs in the power sector. IRENA's Director-General Francesco La Camera said: "Renewable power remains cost-competitive vis-à-vis fossil fuels. The virtuous cycle of long-term support policies has accelerated renewables. In return, growth has led to technology improvements and cost reductions. Prices for renewables are no excuse anymore, on the contrary. The record growth of renewables in 2023 exemplifies this. Low-cost renewables represent a key incentive to significantly increase ambition and triple renewable power capacity by 2030, as modelled by IRENA and set by the UAE Consensus at COP28".



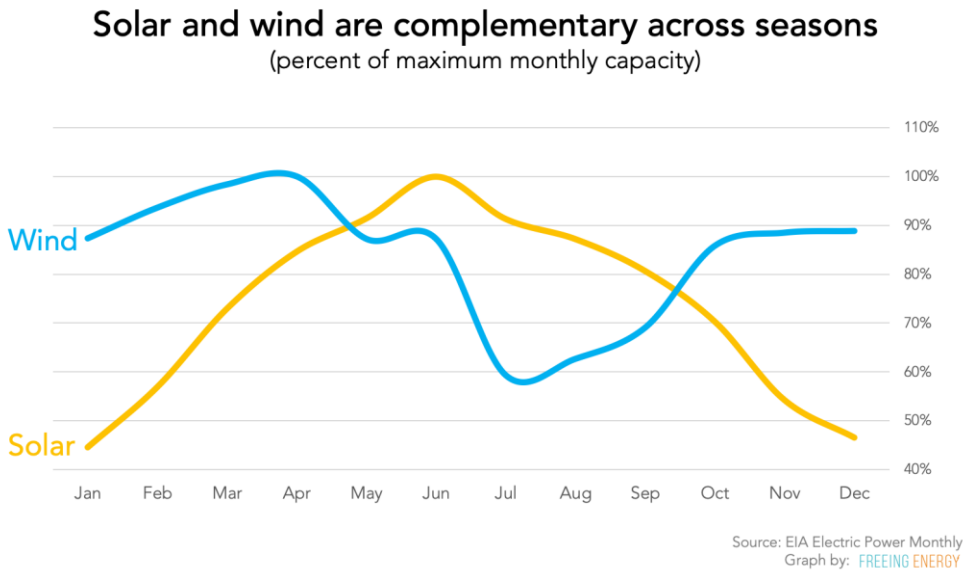

*The graphic below outlines how much the cost of solar and wind power has changed over time. A transition away from fossil fuels would also mean smaller bills for households in Europe. (Source: IRENA)*

With the data presented to you, you may think that a transition to renewable energy can benefit us not only environmentally but also economically, unfortunately that is not the case. While, in truth, the consumption of renewables is cheaper than fossil fuels in the long term, the cost of developing sufficient infrastructure, lack of financing for developing nations, general dependence on fossil fuels and a lack of technological expertise are just some of the barriers rendering this transition the less beneficial choice in the short term.

**Intermittency Issues**

One of the biggest challenges with solar and wind energy is intermittency—they do not produce electricity consistently because they depend on natural conditions.

- Solar panels do not generate electricity at night and produce less on cloudy days.
- Wind turbines generate electricity only when the wind blows at the right speed.
- Seasonal variation affects both energy sources, meaning production fluctuates throughout the years.



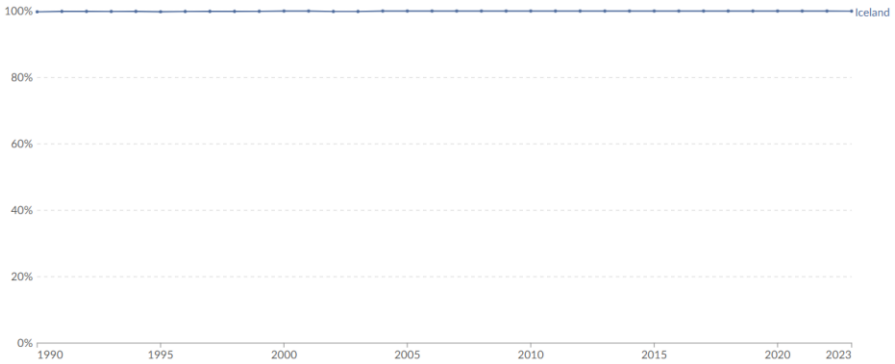

*This graph helps you visualise the fluctuation in solar and wind energy production per month.*

## 4) Success Stories

While a global transition to 100% renewable energy is still in progress, some nations have already achieved near-total reliance on renewables.

- **Iceland:**

100% of its electricity comes from renewables (hydropower & wind power), while leveraging its volcanic activity for geothermal energy.

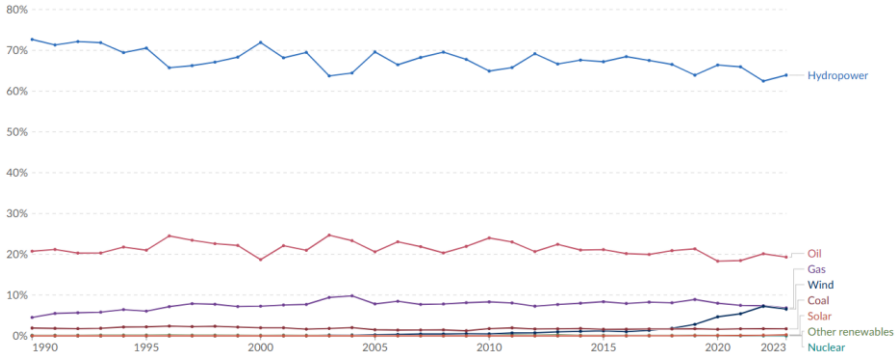



*Share of electricity production from renewables (Source: Energy Institute)*

- **Norway:**

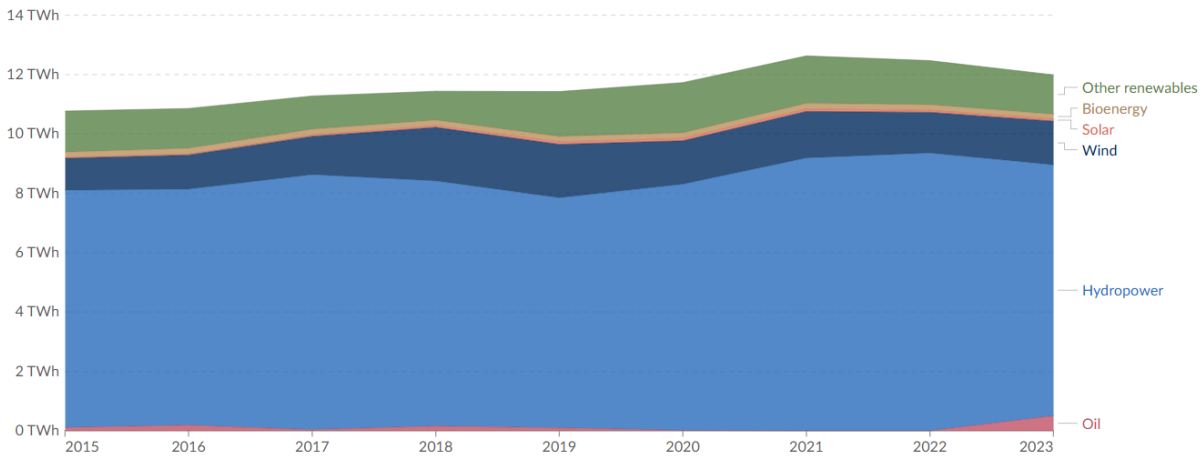
Generates most of its energy consumption from hydropower while simultaneously Investing in offshore wind energy to expand capacity and ensure that there are no power shortages.

*Share of energy consumption by source, Norway (Source: Our World in Data)*




- **Costa Rica:**

Has run on over 98% renewable energy since 2015 using a mix of hydropower, wind, geothermal, and solar. This nation is a great example that a transition to green energy is possible for everyone, even for smaller nations with an equivalent economy.




*Costa Ricas' energy consumption by source (Source: Energy Institute)*

These examples prove that a fully renewable-powered economy is possible, but scaling it globally requires overcoming challenges like storage limitations, grid modernization, and fossil fuel dependency.

## 5) Prospects and Potential Solutions

### Finance for Developing Nations

Developing countries often lack the financial resources to invest in large-scale renewable energy projects. Despite the long-term economic and environmental benefits, the high upfront costs of building solar farms, wind turbines, and energy storage systems act as major barriers to transitioning away from fossil fuels.

To address this issue, financial aid from developed nations and international institutions plays a crucial role in supporting clean energy adoption. The two main mechanisms for this are climate funds and concessional financing (low-interest loans).

The **Green Climate Fund (GCF)** was established under the Paris Agreement to help developing nations finance clean energy projects and adapt to climate change.

**Examples of GCF-Funded Projects**

- India – Solar Power Expansion

The GCF provided $100 million in funding to expand India's solar energy capacity, bringing electricity to rural areas.

- Rwanda – Green Mini-Grids

Funding helped develop solar-powered microgrids, bringing power to villages without traditional grid access.

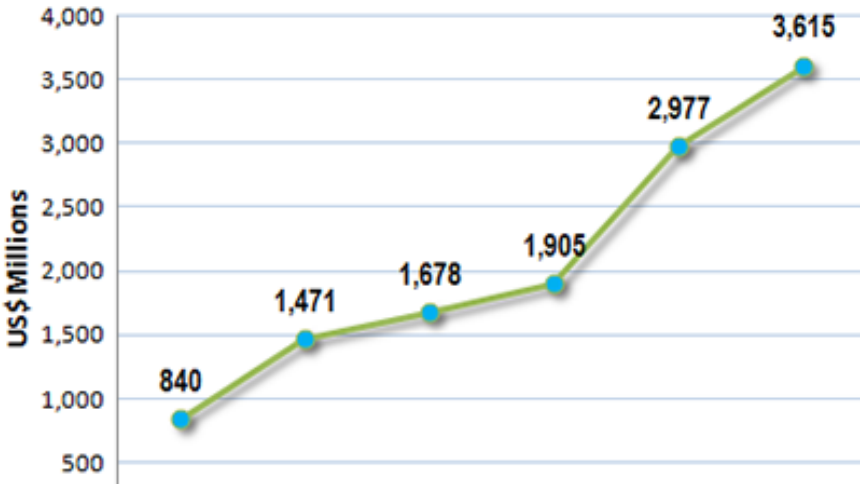
- Bangladesh – Climate-Resilient Energy

GCF supported off-grid solar home systems for millions of households.

**The World Bank**

The World Bank is one of the biggest sources of low-interest loans for renewable energy in developing countries. It provides technical expertise, policy guidance, and funding to help governments build sustainable energy systems.

Key Initiatives are the Scaling Solar Program where it helps countries like Senegal, Zambia, and Ethiopia to develop large-scale solar power plants through public-private partnerships, and the Renewable Energy Guarantee Program (REGP) which reduces financial risks for investors in wind and solar projects in low-income nations.




*World Bank Financing for renewables projects hits all-time high. (Source: World Bank)*

**International Monetary Fund (IMF):**

The IMF provides financial assistance to countries transitioning from fossil fuels to renewables. It encourages policy reforms like phasing out fossil fuel subsidies and introducing carbon pricing to make renewables more competitive. The IMF recently advised Indonesia and Egypt on how to reduce dependence on coal and invest in renewable alternatives.

**Public-Private Partnerships (PPPs)**

Public-Private Partnerships (PPPs) are collaborations between governments and private sector companies to finance, develop, and operate renewable energy projects. These partnerships combine government policies, financial incentives, and private sector investment to accelerate the transition to clean energy.

Governments provide policy support, land, infrastructure, and incentives, while private companies bring investment, technology, and expertise. This model is

particularly useful in developing countries, where governments may lack the financial resources to fund large-scale renewable energy projects alone.

### Examples of PPP's

#### 1) Coventry's Strategic Energy Partnership with E. ON

In Coventry, UK, a 15-year strategic energy partnership with E. ON has led to several innovative initiatives:

- Thermal Drone Surveys: Utilized to identify home insulation issues.
- Electric Vehicle Infrastructure: Installation of EV chargers across the city.
- Public Transportation Electrification: Transition to an all-electric bus system by 2025.
- Energy Efficiency in Low-Income Housing: Piloting free battery installations and green energy upgrades for community buildings and schools.

This collaboration aims for net-zero emissions by 2050, creating green jobs and fostering economic growth.

#### 2) Hyllie: Malmö's Climate-Smart District

Hyllie, a district in Malmö, Sweden, exemplifies climate-smart urban development through a partnership between the city, energy provider E. ON, and water company VA SYD. The district is powered entirely by renewable and recycled energy sources, including solar, wind, biogas, and excess industrial heat. Innovative systems like E. ON's ectocloud and ectogrid optimize and redistribute energy, enhancing efficiency.

## Concerned Countries and Organizations

### Countries

**U.S.A.:** The United States is the world's largest economy, while also being one of the biggest energy consumers, so it occupies a central role in shaping global energy policies. It is one of the top renewable energy investors and producers, as well as a major fossil fuels consumer.

**Russia:** Russia is one of the world's largest fossil fuel producers and has made limited progress in renewable energy. Still, its global influence in energy markets makes it an essential part of any international agreement on clean energy.

**China:** China's pivotal role in the global supply chain of solar panels, wind turbines and other crucial renewable energy devices and technologies cannot go unnoticed. The country is the world's largest emitter of greenhouse gas, as well as a leader in

renewable energy production and investment. Chinas dual role as polluter and clean energy producer and consumer solidifies its influence in global negotiations.

**India:** A country with a rapidly growing population, India is set to be in the centre of talks and negotiations of renewable energy policies. With its government already setting ambitious clean energy goals, India seems to look at solar energy production as a solution for ensuring future energy demands for densely populated, as well as rural areas. It is a major player in the south Asia region, and it also represents the challenge of large-scale renewable energy production.

**Germany:** Already a global clean energy frontrunner, Germanys' phasing out of coal and nuclear power can be an example for all. Sustainability initiatives are actively supported by its population, and a lot of its policies mark a significant shift towards renewable energy.

**United Kingdom:** The UK has largely reduced coal dependence, with investments in offshore wind facilities being the countries pivot for its clean energy transition. Great Britain is experienced in green energy political reforms, and a global advocate for international cooperation, with COP26 having been hosted in Glasgow.

**France:** Frances' unique energy profile, as well as its influence in the European Union and the global stage outlines its key role in the renewable energy sector. With the country relying heavily in nuclear energy, which is considered low carbon, while simultaneously investing in wind and solar, make France an experienced member of global negotiations.

**Japan:** Following the Fukushima disaster, Japan has struggled to balance safety, energy security, and climate goals. It is now investing in hydrogen, smart grids, and offshore wind, contributing technological innovation to the renewable sector.

**Brazil:** Brazil already uses a large amount of hydropower and bioenergy, making it one of the cleaner energy producers in the developing world. However, environmental challenges, like deforestation of the Amazon, complicate its energy profile, showing the tension between economic and environmental priorities. The country's position widely represents pressing challenges that need to be directly faced.

**Canada:** Canada has significant renewable energy potential, especially in hydropower. It also faces challenges due to its role as a major oil exporter. Canada's situation shows how natural resource-based economies can transition toward cleaner alternatives.

**Australia:** Australia has an ideal geographical profile for solar and wind energy production, while also investing heavily in green technologies and innovations in the clen energy sector. Traditionally a large consumer of coal, recent progress suggest shift away from fossil fuels.

**South Korea:** Renewable energy, smart infrastructure and green jobs seem to be the country's' goals for the years to come. As a tech-forward country, it offers

innovative approaches to combining clean energy with economic development, something that can go a long way with countries concerned with losing their financial influence in the world stage.

**Saudi Arabia:** Traditionally known for oil, Saudi Arabia has recently launched several major renewable energy projects, including solar farms and green urban developments. Its transition efforts show how oil-dependent nations can start investing in sustainable alternatives.

**South Africa:** South Africa is heavily reliant on coal but is exploring renewable options like wind and solar. It faces major challenges with energy access and infrastructure, making it an important example of how clean energy can improve both development and sustainability.

**Mexico:** The country has strong renewable energy potential, particularly in solar and wind. However, political uncertainty has slowed progress. It represents countries where the governments will play a key role in shaping the energy transition.

**Indonesia:** Indonesia uses a lot of coal but has significant geothermal and solar potential. It represents the challenges many Southeast Asian countries face in balancing fossil fuel dependence with environmental commitments.

**Italy:** Italy has been expanding its renewable energy sector, particularly in solar and wind. As part of the EU, it follows progressive climate policies and contributes to regional energy cooperation.

**Nigeria:** Having one of the largest populations in Africa, Nigeria faces major gaps in energy access and financing. Its solar potential is high, and renewables could bring major improvements. Nigeria also represents the issue of climate equity and the need for international support.

**UAE (United Arab Emirates):** Although it’s an oil-rich country, the UAE is investing in renewables and sustainable urban projects. As a recent host of COP28, it aims to position itself as a leader in the transition from fossil fuels to clean energy in the Middle East and in the global stage.

**Singapore:** Singapore has limited natural resources but is a global leader in energy efficiency and green finance. Its role in developing clean technology and regional energy cooperation makes it an influential voice despite its small size.

## Concerned Organizations

**IRENA (International Renewable Energy Agency):** IRENA is the main global agency that pushes for renewable energy around the world. It works with tons of countries, helping them figure out how to shift from fossil fuels to cleaner sources like solar and wind. What makes IRENA important is that it doesn't just give advice, it also helps countries plan their energy transitions and connect them with the right technology and investment. Especially for developing countries, IRENA plays a big role in making clean energy more accessible and realistic.

**UNFCCC (United Nations Framework Convention for Climate Change):** The UNFCCC is the group behind major climate agreements like the Paris Agreement. While it's not focused only on energy, it's one of the biggest platforms where countries make decisions about reducing emissions, which almost always involves switching to renewables. The UNFCCC sets global targets and holds countries accountable, which really pushes governments to take action. Without it, there wouldn't be as much international pressure to move away from fossil fuels.

**IEA (International Energy Agency):** The IEA started off focusing on oil security, but now it's one of the main organizations tracking how the world is doing with clean energy. It releases detailed reports and forecasts that governments use when planning their energy policies. The IEA is also really involved in promoting newer technologies like hydrogen, battery storage, and smart grids. Even though it's not a funding organization, its influence comes from its research and its role in setting the direction for global energy policy.

**World Bank:** The World Bank might not sound like an energy organization, but it funds a huge number of renewable energy projects, especially in lower-income countries. It helps build things like solar farms, wind power systems, and even off-grid solutions for villages. The World Bank also gives technical support and policy advice, which can be just as important as the money. Its focus on sustainable development makes it a key player in helping countries grow their economies without relying on fossil fuels.

**Green Climate Fund (GFC):** The GCF was created to help poorer countries deal with climate change, and supporting renewable energy is a huge part of that. It provides funding to countries that want to shift to clean energy but can't afford to do so on their own. The GCF it focuses on both reducing emissions and helping countries adapt to the effects of climate change. Since the energy transition can't be fair without financial support, the GCF is essential for making sure no one gets left behind.

## Latest Developments

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| The Paris Agreement (2015) | Adopted at COP21 in France, the Paris Agreement marked a historic moment when nearly every country on Earth came together with a shared goal: to limit global warming to well below 2°C, aiming for 1.5°C above pre-industrial levels. Each nation pledged to develop its own strategy to cut emissions and boost renewable energy sources like wind and solar power. For the first time, the world united behind a clear climate target, giving the agreement an undeniable significance. It pushed governments worldwide to take meaningful action, sparking major investments in clean energy. |
| Chinas Solar Expansion (2017-present) | Since 2017, China has emerged as a global leader in solar energy, dominating both production and installation. By mass-producing affordable solar panels and exporting them widely, China has helped bring down costs, making solar power accessible to countries everywhere. This solar boom has played a crucial role in accelerating the global shift away from fossil fuels. |
| REPower EU Plan (2022) | When Russia's invasion of Ukraine triggered an energy crisis, the European Union responded swiftly with its REPower EU plan in 2022. The plan's main goal is to end Europe's dependence on Russian fossil fuels by ramping up investments in clean energy, including solar, wind, and green hydrogen. It also focuses on speeding up the approval process for renewable projects and improving energy efficiency. Beyond tackling climate change, this strategy highlights how clean energy can strengthen energy security, and it's already accelerating renewable development across the continent. |
| The US Inflation Reduction Act (2022) | The Act is the largest climate investment in U.S. history. It puts hundreds of |

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| | billions of dollars into clean energy, offering tax credits and funding for wind, solar, electric vehicles, green hydrogen, and more. The goal is to reduce U.S. emissions by 40% by 2030. This act transformed the U.S. into a global leader in clean energy investment and encouraged other countries to increase their efforts as well. |
| G7 Commitment to Clean Power by 2035 (2022) | In 2022, the G7 countries, including the United States, United Kingdom, Germany, France, Japan, Canada, and Italy committed to creating electricity systems that are mostly free of fossil fuels by 2035. This means increasing the use of renewables and reducing coal and gas power generation. This decision by the G7 set a strong example for the rest of the world, showing that major economies are serious about phasing out fossil fuels and leading the clean energy transition. |
| COP28 Fossil Fuel Agreement (2023) | At the COP28 summit held in the United Arab Emirates, nearly 200 countries reached a landmark agreement to move away from fossil fuels. They set ambitious targets to triple renewable energy capacity and double energy efficiency by 2030. While the agreement isn't legally binding, it was a powerful signal that the world is heading toward a future powered by clean energy. |

## UN Involvement

As stated before, the presence of the United Nations in the global energy landscape is fundamental in making important steps towards a greener future. Here are some key moments when the UN played an important role in encouraging a global transition to renewable energy.

### Creation of the Sustainable Development Goals (2015) - https://sdgs.un.org/goals

The UN adopted the 2030 Agenda for Sustainable Development, which includes 17 Sustainable Development Goals (SDGs). Goal 7 focuses on ensuring access to affordable, reliable, sustainable, and modern energy for all. This goal promotes renewable energy expansion worldwide and encourages countries to increase the share of renewables in their energy mix. It is greatly important since it sets a global framework linking energy access, climate action, and sustainable development, motivating countries to invest in renewables.

### Hosting the UN Climate Change Conferences (COPs) - https://unfccc.int/process/bodies/supreme-bodies/conference-of-the-parties-cop

The UN Framework Convention on Climate Change (UNFCCC) organizes the annual Conference of the Parties (COP) meetings, which are central to global climate and energy negotiations. Major agreements for the clean energy sector have been adopted under the UN's guidance. COP meetings consistently promote renewable energy as a key solution for reducing emissions by bringing countries together to set targets, share technology, and fund renewable energy projects worldwide.

### UN Energy Initiative - https://www.seforall.org/programmes/un-energy , https://www.un.org/en/energy

The UN-Energy program was created to coordinate the UN's work on energy issues, including renewable energy. It supports sustainable energy policies and promotes investment in clean energy technologies across developing and developed countries. The importance of the initiative lies in its role for helping to align various UN agencies to work together on accelerating renewable energy access worldwide.

## Possible Solutions

- Creation of new mechanisms, like IRENA, with the purpose of facilitating a transition to renewable energy.
- Incentivize other countries through political decisions. An example of this can be trade benefits for clean energy devices, or tax breaks for companies in the green energy sector.
- Push to implement global climate goals already set, like the Pari Agreement.

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