



# BAUMUN'24 UNFCC Study Guide

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#WelcomeToBosphorus

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## **1) Letter from the Secretary-General**

Dear Participants,

On behalf of the Secretariat and the entire Organization Team, it is my honor to extend a warm welcome to you all for the BAUMUN'24. As Secretary-General, I am thrilled to see intelligent, driven people from diverse organizations come together to have fruitful discussions and diplomatic engagements.

You will have the chance to participate in inspiring debates, negotiation sessions, and social events during the conference. There is no doubt that the diverse range of experiences and perspectives that each delegate brings to the table will enhance the success and energy of this conference.

Our dedicated team has put in endless hours to make sure that every detail of the conference is well thought out to give every participant a fulfilling and unforgettable experience. Through our committees and social events, we hope to establish an atmosphere that promotes friendship, teamwork, and a profound understanding of the UN's principles.

I invite you to approach each session of this intellectual experience with an open mind, a cooperative spirit, and a dedication to finding common ground. Your enthusiastic and active participation is what will make this conference a success, and I do not doubt that your efforts will make it something remarkable.

Once again, welcome back to the BAUMUN'24 and Welcome Back to Bosphorus. May your time here be filled with meaningful discussions, lasting connections, and a sense of accomplishment as we work together to empower tomorrow.

Sincerely,

**Ilgim Mina ABAT**

*Secretary-General of BAUMUN'24*

## **2) Letter from the Committee Board**

Greetings delegates,

As your committee board, we're honored to welcome all participants to the second annual session of Bahçeşehir University Model United Nations.

In the first instance, we expect you to stay fairly superficial by not narrowing the subject down and to think in universal terms as much as possible, so we have written an abstract and framework study guide. Throughout the study guide you can review the various intricacies of the topic and be given additional information about its place in the global sphere. We hope that it will help expand your perspective and enhance your preparation for the upcoming conference. However, we would still recommend that you research more in depth about the topic and form your country's political, social and economical points of view, since the guide will not delve into individual foreign policies. While researching these topics, we highly recommend delegates to stay within the boundaries of the titles in the study guide and take full advantage of this background guide.

Can't wait to meet you all,

Yours sincerely,

Naz ÇOBAN & Emir ELHATİP

Board members of the UNFCCC

### **3) Introductions**

#### **3.1) Introduction to the United Nations Framework Convention for Climate Change**

The Intergovernmental Panel on Climate Change (IPCC), which was jointly established by the UN Environment Program (UNEP) and the World Meteorological Organization (WMO) in 1988, met on 3-14 June 1992 against the effects of global warming caused by human-induced activities on the climate. The United Nations Framework Convention on Climate Change (UNFCCC) was opened for signature at the United Nations Conference on Environment and Development (Rio Earth Summit). There are 197 parties to the agreement, including our country.

Purpose of the contract; To keep the greenhouse gas in the atmosphere and the human-induced impact on the climate system at a certain level on the basis of equality and in accordance with the principle of common but different responsibility, to encourage the party countries to cooperate on research and technology and to protect greenhouse gas sinks, to reach such a level that the ecosystem adapts to climate change. is to be achieved within a time that will allow economic development to continue in a sustainable manner.

The Convention divided the countries into three groups: Annex I, Annex II and Non-Annex Countries, according to different obligations.

#### **ANNEX 1:**

There are 40 countries and the European Union in ANNEX-1. These countries are classified into 2 groups: industrialized countries and countries in transition to a market economy:

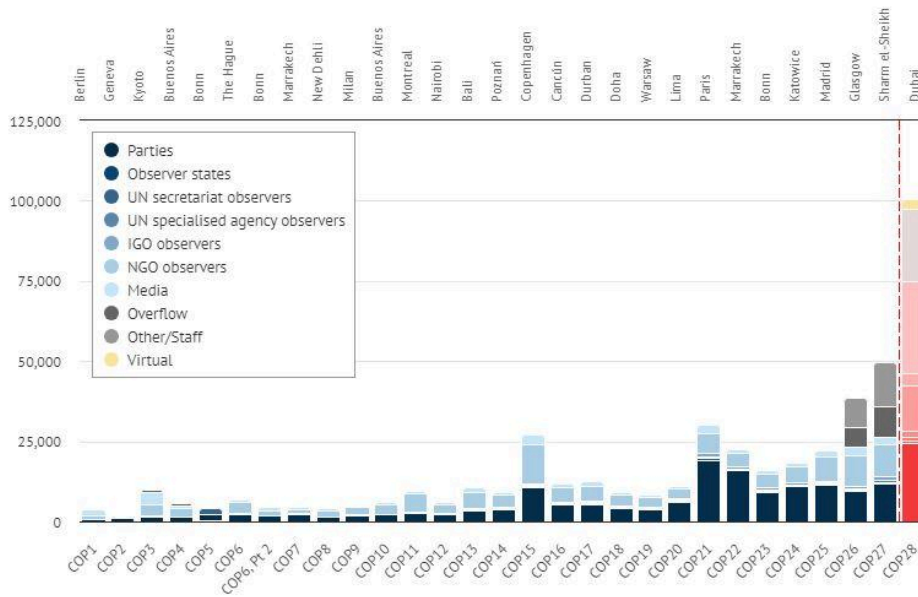
Germany, USA, Australia, Austria, Belarus, Belgium, Bulgaria, Czechoslovakia, Denmark, Estonia, Finland, France, UK and Northern Ireland, Netherlands, Ireland, Spain, Sweden, Switzerland, Italy, Iceland, Japan, Latvia, Lithuania, Luxembourg, Hungary, Norway, Poland, Portugal, Romania, Russia, Turkey, Ukraine, New Zealand, Greece.

## **ANNEX-2:**

There are 23 countries and the European Union in ANNEX-2. Turkey was voluntarily removed from the EK-2 list and was included in the EK-1 transition economy class in 2001. These countries are industrialized countries that support countries that need financial resources in the fight against climate change:

Germany, USA, Australia, Austria, Belgium, Denmark, Finland, France, Netherlands, UK and Northern Ireland, Ireland, Spain, Sweden, Switzerland, Italy, Iceland, Japan, Luxembourg, Canada, Norway, Portugal, New Zealand, Greece.

### Total attendance at COPs through the years



Source: UNFCCC and Carbon Brief analysis.



### 3.2) Introduction to the Agenda Item

World leaders, government officials, international organizations and non-governmental organizations came together for the United Nations Climate Change Conference of the Parties (COP) in Dubai, United Arab Emirates, between 30 November and 12 December. It was held for the 28th time this year to stop climate change, now called the Climate Emergency.

The Global Situation Assessment, which is an outcome of the Paris Agreement and planned to be held every 5 years, was aimed to show how far countries have come in combating the climate crisis. The first Global Situation Assessment was decided upon after long negotiations at COP28. In the relevant decision text, the need for deep, rapid and sustainable reductions in greenhouse gas emissions in line with limiting the global average temperature increase to 1.5°C was accepted. In addition to “moving away from fossil fuels”, the decision calls on States Parties to:

- Ensuring that their next nationally determined contribution has ambitious, economy-wide emissions reduction targets that cover all greenhouse gases, sectors and categories and are compatible with limiting global warming to 1.5°C;
- Tripling renewable energy capacity globally and doubling the global average annual rate of energy efficiency improvements by 2030;
- Accelerate efforts to phase out coal power with unmitigated emissions;
- Accelerating zero- and low-emission technologies, including renewable energy, nuclear energy, abatement and removal technologies such as carbon capture, utilization and storage, especially in sectors where abatement is difficult, and low-carbon hydrogen production;
- Rapidly and significantly reduce non-carbon dioxide emissions globally, including in particular methane emissions, by 2030;
- Accelerating the reduction of emissions from road transport through a range of means, including improving infrastructure and rapidly expanding the deployment of zero and low-emission vehicles;
- Phasing out as soon as possible inefficient fossil fuel subsidies that do not address energy poverty or just transitions.

The GST decision has been criticized as inadequate because it does not call for a concrete exit from coal and other fossil fuels, does not define nuclear energy and carbon capture and storage technologies as acceptable options in the fight against climate change, and does not call for the end of subsidies for fossil fuels without granting exceptions.



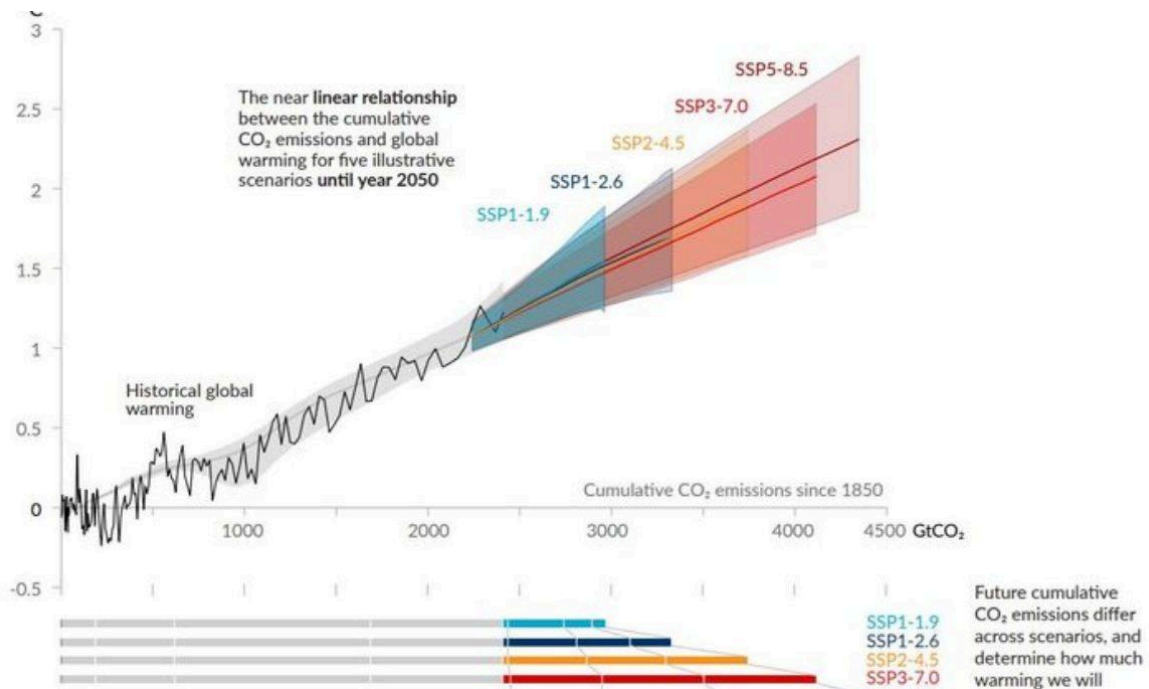
**QUITTING FOSSIL FUELS:** It was the expectation of the countries and non-governmental organizations most affected by climate change to conclude an agreement with concrete targets to end/reduce the use of fossil fuels in order to limit the global average temperature increase to 1.5 degrees Celsius.

In the COP28 decision text, a call was made to the countries party to the Framework Convention on Climate Change to "move away from fossil fuels in an orderly and equitable way in energy systems, to accelerate actions in this critical decade, and thus to reach net zero by 2050 in accordance with science."

With this decision, the phrase "fossil fuels" was included in a COP text for the first time. Some of the non-governmental organizations, experts and negotiators who followed the negotiations evaluated this as "the beginning of the end for the fossil fuel era" and stated that it was a historical decision.

On the other hand, there were also negotiators who stated that this decision was not sufficient and that a rapid exit from fossil fuels should be called for a concrete and urgent response to the climate emergency. Representatives of most less developed countries and negotiators of island states protested the final decision.

132 countries have committed to tripling renewable energy capacity and doubling energy efficiency by 2030, as included in the GST decision.



**COMPENSATION OF LOSSES AND DAMAGES:** The Loss and Damage Fund, perhaps one of the most important outcomes of COP27, is a financing mechanism created to compensate the losses and damages suffered by underdeveloped and developing countries that are least responsible and most affected by the climate crisis. Some steps, albeit limited, were taken to start operating this fund at COP28. By the end of the conference, US\$720 million had been raised for the fund. However, research shows that this amount corresponds to less than 0.2 percent of the irreversible economic and non-economic losses of developing countries. According to studies, losses and damage in developing countries are estimated to be between 100 billion and 580 billion US dollars.

**MORE FINANCE FOR CLIMATE:** Strengthening climate finance resources, making them transparent, and creating innovative financial resources such as fossil fuel extraction tax were among the expected outcomes of COP28. During the conference, the support of developed countries to fund resources created under the titles of the Green Climate Fund, Adaptation Fund, Least Developed Countries Fund and Special Climate Change Fund was announced in order to provide developing countries with the climate

finance they need. However, it is stated that the amount of financing accumulated in these funds is far behind the 2.4 trillion dollars estimated to be needed by 2030.

According to a study by the International Monetary Fund (IMF), states provide 19 billion US dollars of support to coal, oil and natural gas in one day. The first step to be taken to exit fossil fuels is to cut off these supports as soon as possible.

At the conference, on December 2, world leaders came together for the first time on "Health and Climate".

The expectations of healthcare professionals and civil society from the Health and Climate Leaders Meeting were to increase the resilience of national health systems for societies resistant to the climate crisis and to abandon fossil fuels as soon as possible in order to limit the temperature increase to 1.5 degrees.

At the end of the Health and Climate Leaders Meeting, the COP28 UAE Climate and Health Declaration was announced.

- The aim of the declaration is expressed as "placing health at the center of climate action and accelerating the development of climate-resilient, sustainable and equitable health systems".
- The declaration underlines the urgency of climate action and highlights the health benefits of just transition programmes, air pollution prevention, sustainable nutrition and mobility, and deep, rapid and sustainable reductions in greenhouse gas emissions.
- The declaration, created with the joint work of the COP28 Presidency, the World Health Organization and the UAE Ministry of Health and Protection, was signed by more than 120 countries.

- To support these political commitments, a number of new funding commitments were also announced.
- However, although the Declaration on Health and Climate defines the prevention of air pollution as a goal, it is criticized for not clearly expressing the necessity of exiting fossil fuels to stop pollution and the climate crisis.

#### 4) Key Vocabulary and Definitions

**Renewable Energy:** Renewable energy is energy that can be obtained from carbon-neutral natural sources such as sunlight, wind, rain, tides, waves and geothermal heat, and from sources that are naturally renewed on a human time scale.

**Fossil Fuels:** Fossil fuel or mineral fuel is a natural energy source containing hydrocarbons and high amounts of carbon. Coal, oil and natural gas; is a prime example of this type of fuel. It occurs when dead living organisms decompose in an oxygen-free environment for millions of years.

**European Union:** The European Union is a supranational structure formed by the coming together of European states and citizens, which envisages the integration of European peoples in economic, political, social and cultural fields.

**Framework:** In computer programming, software skeleton, software framework or software framework are systems in which standard functions are offered ready-made, but the desired parts of these functions can be updated by the programmer with additional codes as desired.

**Greenhouse Gas:** Greenhouse gases are gaseous components of the atmosphere, both natural and anthropogenic, that absorb and emit certain wavelengths of radiation within the spectrum of infrared radiation emitted by the Earth's surface, atmosphere, and clouds. Due to these properties, they cause the greenhouse effect.

**Carbon Emission:** Carbon emission refers to the release of naturally occurring carbon into the atmosphere. Carbon emissions are mostly a result of human-induced activities. With the use of coal-powered industrial vehicles since the 19th century, the greenhouse gas concentration in the atmosphere has also increased.

## **5) Past Implementations and Legislations**

### **5.1) Kyoto Protocol**

It was accepted at the 3rd Conference of the Parties (COP3) to the UNFCCC held in Kyoto in December 1997 and entered into force in 2005. Our country became a party to the Protocol in 2009. 191 countries and the European Union are parties to the Kyoto Protocol, which entered into force on February 16, 2005.

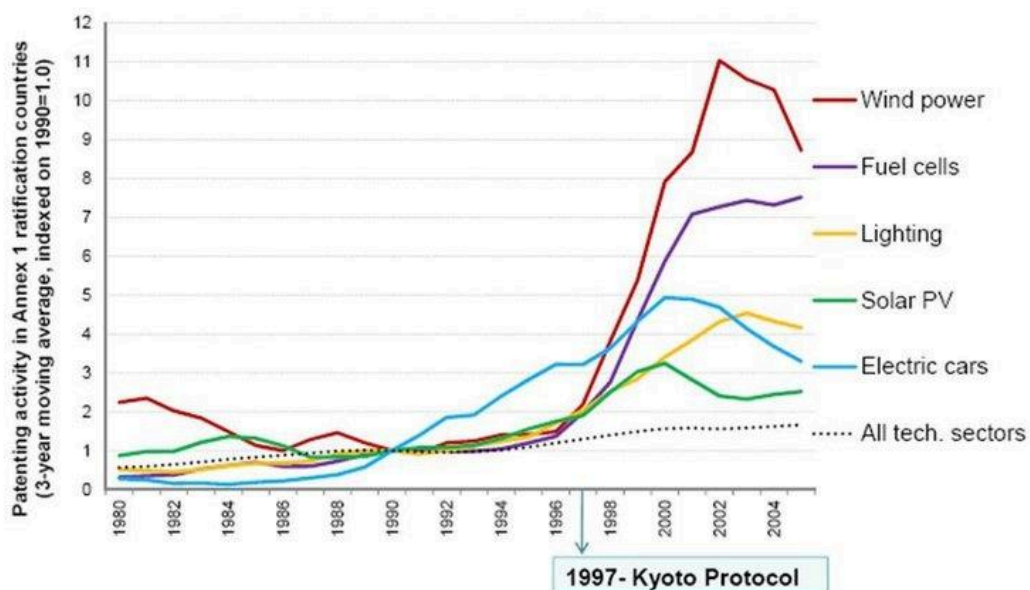
The protocol aims to share the burden of the UNFCCC. The main difference between them and a framework contract is that it is legally binding. The details of the protocol and its preparation for implementation were carried out at the 7th Conference of the Parties (COP7). The protocol placed more responsibilities on developed countries. UNFCCC ANNEX-1 countries, which are obliged to reduce or controlled increase in emissions, constitute the ANNEX-B list of the Protocol. The aim of the Protocol is to reduce the total greenhouse gas emissions of Annex B countries to 5% below the 1990 level in the first commitment period between 2008 and 2012. . The second commitment period of the Protocol is determined as 2013-2020. In the second commitment period, it was decided that the countries in the Annex

B list would reduce their emissions by at least 18% in 2020 compared to 1990. The USA, Japan, Russia and New Zealand did not take part in the second commitment period.

Countries that are party to the Protocol other than Annex B countries are called Non-Annex countries and they do not have numerical obligations for greenhouse gas emission reduction.

Since the Kyoto Protocol will expire in 2020 and none of its provisions could be fully implemented by the party countries, a new agreement was needed and the Paris Agreement was accepted for the period after 2020.

Carbon emission is one of the main problems that concern the whole world. 2.5 billion tons of carbon emissions occur every year from power plants in America alone. China follows it with 2.4 billion tons.



Source: OECD (2010), *The Invention and Transfer of Environmental Technologies*

Kyoto Protocol; It imposed some sanctions on the states, although they were not mandatory. Some investments had to be made within the scope of these sanctions. With these very expensive investments, it was expected

that harmful gasses would be kept at the level before 1990. What needs to be done according to the protocol;

- Reducing the amount of harmful gasses affecting the atmosphere to 5%
- Reducing greenhouse gasses caused by industry, traffic and heating
- Environmentalism is at the forefront in many sectors, including industry
- Using minimum energy for heating and production
- Turning to alternative energy sources
- Evaluation of natural fuel options instead of fossil fuels
- Incorporating advanced waste systems in factories that require high energy, such as cement and steel
- Using better carbon filtration systems in thermal power plants
- More investment in nuclear and solar energy
- Collecting more taxes from businesses whose fuel consumption is above a certain limit compared to others.

Kyoto Protocol; It ended in 2020. The countries that signed this protocol could not fully fulfill their commitments. However, new steps are not being taken regarding global warming. The Paris Climate Agreement, signed by 196 countries in 2016, is a new agreement for global greenhouse gas emissions. This agreement aims to reduce the global temperature below 2

degrees Celsius; On the contrary, the Kyoto Protocol covers all countries in the world, not just developed countries.

We see that there are many agreements made for a better world. However, the dependence on fossil fuels is also obvious. Fossil fuels have a huge share in carbon emissions. Carbon emissions are rapidly changing climates. Pollution in seas and oceans, environmental pollution, deforestation and many other factors reduce carbon dioxide absorption.

## **5.2) Paris Agreement**

The Paris Climate Agreement is an agreement with the participation of different countries. The Paris agreement aims to strengthen efforts to prevent the climate crisis. This agreement aims to reduce global temperature rise to pre-industrial levels. The current version of the process within the scope of the United Nations Framework Convention on Climate Change started in 2020. The language and articles of the agreement are based on the United Nations climate change conference held in Paris in 2015. It contains articles decided upon at this conference and approved unanimously. The agreement was designed to prevent the possible negative consequences of global climate change. The main goal; It is stated that the aim is to keep the global temperature change below 2 degrees Celsius, which is the pre-industrialization levels, and to limit this increase to 1.5 degrees.

### **What's the difference between 1.5 and 2 degrees?**

Data presented by the Intergovernmental Panel on Climate Change (IPCC) emphasize that a 1.5°C warming would be relatively safer than 2°C. According to the IPCC, the flood risk, which is expected to increase by 100% when the average surface temperature increases to 1.5, will reach 170% with a 2°C warming. Additionally, the number of people exposed to severe



drought could rise to 350 million with a 1.5°C increase and 410 million with a 2°C increase. Extreme heat waves can affect 28% of the world's population instead of 9%. However, it is known that every 0.5°C increase will further reduce crop productivity in agriculture.

If the global average temperature increase exceeds 2 degrees, there will be devastating consequences that will directly affect human life.

The signing date of the Paris Climate Agreement is 2015. It entered into force 1 year after this signature process. As of March 2021, there are 191 member countries. The long-term goals of the Paris Climate Agreement include controlling temperature and global average temperature increases. According to the Paris Climate Agreement, signatory member countries must regularly report what kind of contribution they have undertaken to reduce global warming. This report should also state their planning and financing. Scientists state that controlling the temperature increase will significantly reduce the possible effects and risks of climate change. To achieve this goal, emissions and greenhouse gases must be controlled, inspected and regulated. Some countries have to be more responsible in this agreement due to their emissions. But this does not mean that a clear calculation is possible.

In the light of the latest data published, it is stated that 50 percent of global emissions belong to China, the USA, the European Union and India. Türkiye is among the top 20 countries with the most emissions in this list. The countries that have been more responsible in historical terms are considered to be the USA, Russia and European countries, originating from the Industrial Revolution. On the per capita emissions side, the USA and China are at the forefront.

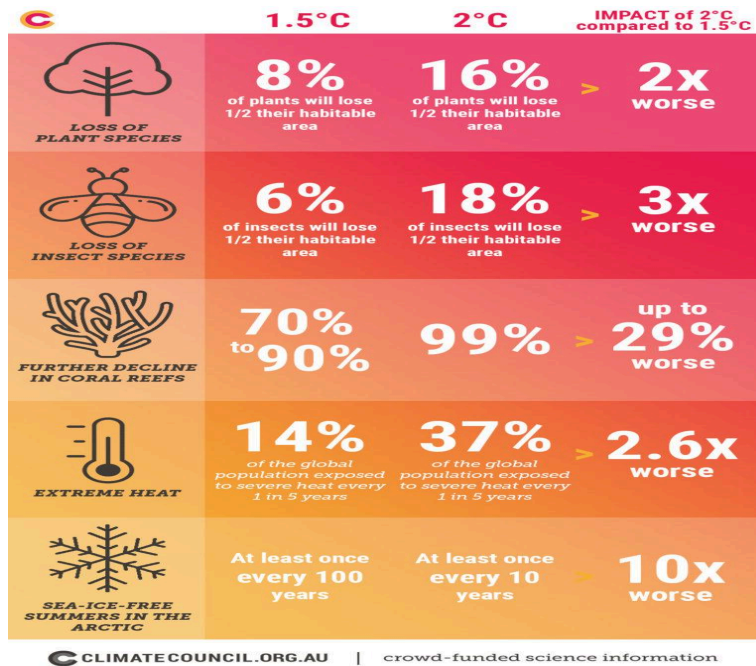
The Paris Climate Agreement came into force in 2016. The articles of this agreement develop and change over time. Today's most current Paris

Climate Agreement articles are basically to keep the global temperature increase under control and prevent climate change. It also aims to complete the adaptation process of countries against all possible problems that may be caused by climate change. These articles, designed to increase climate resilience, also include important issues on the financial flow side. The prominent article among the goals of the Paris Climate Agreement is as follows:

“The purpose of the Paris Climate Agreement is; to ensure sustainable development and to end poverty caused by non-sustainability.”

This item is very important for many countries. Because development affects the future, economy, peace and many other issues of countries. At the same time, greatly reducing poverty, hunger and health problems is a very important issue for the whole world. However, the articles of the agreement also include:

- The global average temperature increase should be kept below 2 degrees.
- This temperature is the value that existed before industrialization.
- Member countries that have signed the agreement must adapt to the negative effects of climate change.
- Climate resilience should be increased.



### 5.3) Glasgow Pact

The 2021 United Nations Climate Change Conference, commonly known as COP26, is an organization held in Glasgow, Scotland, between 31 October and 12 November 2021, with the participation of 197 countries with the aim of reducing global warming and greenhouse gas emission rates.

It was the fifteenth conference held within the scope of the United Nations Framework Convention on Climate Change and the third conference held after the Paris Agreement came into force. For this reason, it is also called COP26 and CMA3.

Here are the key points that delegates agreed on:

- Emission Reduction

Current national plans to reduce emissions by 2030, also known as the National Contribution Statement, are insufficient to limit the temperature increase to 1.5 degrees. According to an analysis published during the

negotiation process, current plans would lead to catastrophic warming of 2.4 degrees.

At the summit, only one major emitter – India – reported a new national contribution declaration. Therefore, the task of bringing the declarations into line with the 1.5 degree target was left until after Glasgow.

But under the 2015 Paris Agreement, nations must renew their targets every five years, and 2025 is set to discuss national declarations covering the period beyond 2030. Adhering to this timeline could push warming beyond 1.5 degrees. That's why one of the key goals for UK homeowners was to chart a roadmap for earlier revisions.

This goal has been achieved: the issue of reviewing National Contribution Declarations will be on the agenda of next year's COP27 in Egypt and the following year's COP28.

This gives countries that want higher targets for emissions cuts significant leverage to get countries that are lagging behind to step up. Glasgow would not be the final point in the fight against the climate crisis anyway. Therefore, it is a good move to create a road map for revisions for next year (rather than years later).

- Coal

Coal is the dirtiest fossil fuel and the International Energy Agency has stated that if coal is not phased out urgently, the world will have no hope of staying within the target of limiting warming to 1.5 degrees. To achieve this goal, at least 40% of the existing 8,500 coal-fired power plants must be closed and no new power plants should be opened.

One of the most discussed issues in Glasgow was the commitment to “phase out” coal-fired electricity generation. Initially, this target was set as a

“phase phase out of coal”, but India insisted on the change despite demands from other developing countries.

This decision may seem hard to believe, considering that it is at the center of the dual crisis of fossil fuels. However, since the Kyoto Protocol was signed in 1997, no COP has made direct reference to fossil fuel phase-out.

This reflects fierce opposition from countries that depend on fossil fuel consumption because they produce oil and coal. Great progress was made in the meeting, which relied on consensus for all decisions taken. Even the eased commitments were welcomed as significant developments.

- Adaptation and Climate Finance

In 2009, rich countries pledged to transfer at least \$100 billion to poor countries by 2020 to cut their emissions and combat the effects of the climate crisis. But by 2019 (the last year for which data is available) only \$80 billion had been reached.

The anger of developing countries on this issue was also reflected in the negotiations. As a result, developing countries were promised that climate finance would be increased to 500 billion dollars over the next five years and the increases would be monitored. More importantly, aid recipient countries demanded that the funding be spent on adaptation rather than emissions cuts.

This development is important because existing climate finance goes to emissions-cutting projects, such as renewable energy schemes, which can be easily financed without aid because they can often be turned into a profit in middle-income countries. The poorest countries, which needed money to adapt to the effects of extreme weather events, received no funding at all.

As a result, the agreement agreed to double climate finance allocated to adaptation. The targets are still not enough, as the United Nations and some countries want emissions cuts and adaptation funds to be halved. But it is still an important step.

- **Loss and Damage**

Loss and damage refer to the ravages of the climate crisis that are too devastating to be prevented or adapted to. Such as storms, hurricanes, or inundation of low-lying areas by storm surges.

Countries have been talking about casualties and damage for several years, but negotiations have made little progress. Developing countries are already spending too much to repair the damage caused by the climate crisis by stretching their budgets, he said. But developed countries are cautious about treating the debate as a call for compensation for climate damage. Because this situation may leave them open to endless legal liability.

At the last COP, discussions progressed sufficiently to establish a database and communication and reporting system called the Santiago Network. Many developing countries hoped COP26 would go a step further with a funding mechanism for losses and damages. This expectation was not realized and the issue will be returned to negotiations in the coming years.

#### **5.4) Katowice Climate Change Package**

The 24th United Nations Climate Change Conference of the Parties (COP24), held in Katowice, Poland, between 2-14 December, went down in history as the longest climate summit.

The Katowice Climate Package, a compilation of Paris Rulebook documents, excluding rules on carbon trading, was adopted at COP 24, along with several resolutions and action items that brought minor progress in certain areas such as finance, gender, and ancient peoples. However, looking at the overall picture, COP 24 remained far from a solution on the most fundamental issues such as increasing the target for national contributions, implementing human rights in the Paris Rulebook, and securing fair and reliable support that will help developing countries in their efforts to combat global climate change and its effects.

The Special Report on Global Warming of 1.5 degrees, published on October 8 by the Intergovernmental Panel on Climate Change (IPCC), the UN body tasked with evaluating the scientific side of climate change, gave a last-minute alarm to save the world. The main messages of the report were very clear and unwavering: Limiting the temperature increase to 1.5 degrees is only possible by halving carbon emissions by 2030 - that is, in just 11 years - and reaching "net zero" by 2050. Such radical emission cuts require massive transformations in global energy and transportation systems and the protection and restoration of natural ecosystems.

Therefore, almost 3 years after the adoption of the Paris Agreement, at the 24th Conference of the Parties (COP 24) of the United Nations Framework Convention on Climate Change (UNFCCC), which started on December 2 in Katowice, the heart of Poland's coal production. ) More than 22,000 participants expressed great optimism about scaling up the targets – to reduce emissions and increase the financing needed for developing countries to implement those reductions.

- The main purpose of COP24 was to finalize, decide and put into effect the rules and procedures on how the Paris Agreement, which entered into force in 2016, will be implemented in practice. The

summit was an event in which this aim was achieved to a significant extent.

- While countries have agreed on the rules of the Paris Agreement that provide flexibility in general terms on issues such as national contributions and mitigation, climate finance reporting, transparency, global stock reporting, losses and damages, discussions on some issues important for the implementation of the agreement, such as market mechanisms and international emissions trading, have been negotiated. left to the next peak.
- At the climate summit, it was decided to set a new climate finance target for after 2025, with a base level of 100 billion dollars per year.
- The Katowice Package basically includes guidance on what information countries should share in their National Contribution Declarations (NDC) on many issues such as mitigation, adaptation, financing, capacity development and technology transfer. Guidelines regarding the information that should be presented in the context of the transparency clause were defined within this package.
- At the summit, it was agreed in principle to determine more ambitious policies and actions by going over the outputs of the facilitative dialogue process called Talanoa.
- The World Bank has committed USD 200 billion in climate finance for the period 2021-2025.
- Multilateral development banks declared that they would align their activities and goals with the Paris Agreement.



- While the C40 Cities Coalition announced that it will intensify its efforts to ensure that efforts are made in line with climate targets in cities around the world, 15 international institutions announced that they will align their operations with climate targets.

## 5.5) Sendai Framework

The Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted at the third UN World conference held in Sendai, Japan, on 18 March 2015. The Sendai Disaster Risk Reduction Framework aims to “significantly reduce disaster risk and the loss of life, livelihood, health and economic, physical, social, cultural and environmental assets of individuals, businesses, communities and countries due to disaster” over the 15 years between 2015 and 2030. aims to achieve.

It came into force under the auspices of the United Nations to ensure compliance with national conditions, local laws, international obligations and commitments in the implementation of the Sendai Disaster Risk Reduction Framework, which was prepared by taking advantage of the principles in the Yokohama Strategy for a Safer World and the Hyogo Framework Action Plan.

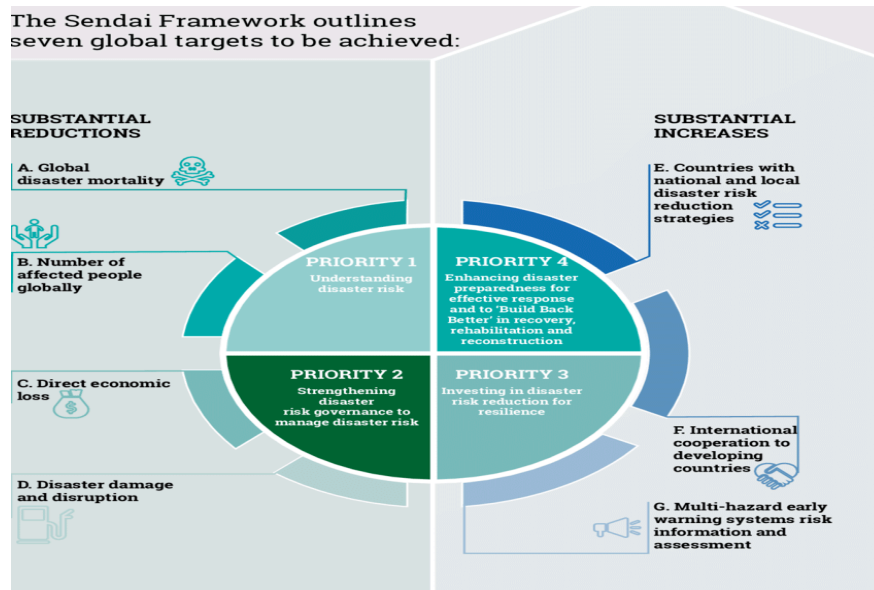
Taking into account the experience gained in implementing the Hyogo framework action plan (HFA), a number of actions are needed by States within and across sectors at local, national, regional and cultural levels in the four priority areas shared below.

1. Reducing disaster risk,
2. To strengthen disaster risk governance to manage disaster risk,
3. Investing in disaster risk reduction for resilience,

4. Developing and improving disaster preparedness efforts for effective response and “Building Better Than Before” during the rehabilitation and reconstruction phases.

Seven global targets have been identified to support the assessment of global progress towards achieving the expected outcome and purpose of the Sendai Framework for Disaster Risk Reduction.

- Significantly reduce the global number of deaths due to disaster by 2030,
- Significantly reduce the number of people affected by disasters globally by 2030,
- To reduce direct economic losses caused by global disasters by 2030,
- Significantly reduce damage to critical infrastructures due to disasters and disruptions in the provision of basic services, including health and education facilities, and accordingly strengthen infrastructural resilience by 2030,
- Increasing the number of countries developing national and local disaster risk reduction strategies,
- Significantly increase international cooperation to provide adequate and sustainable support to developing countries to complete their national actions on the implementation of this framework by 2030;
- Significantly increase the use of multi-hazard early warning systems, disaster risk information and assessments and their availability to society by 2030.



## 6) The Global Stocktake

Under the Paris Agreement, the Global Stocktake entered into force in 2016. Aiming to combat climate change, the initiative intends to decisively combat climate change by assessing the collective efforts of countries and determining whether they are sufficient to achieve the long-term objectives of the initiative.

The process consists of analyzing information on greenhouse gas emissions, mitigation measures, adaptation actions, and the support provided by developed nations – mainly the OECD countries.

The first formal Stocktake was held last year in Dubai, along with COP-28, and the session is scheduled to be held every 5 years, the following session to be held in 2028.

### 6.1) Sustainable Development Goals

In 2015, the United Nations adopted 17 interconnected global goals to achieve the 2030 Sustainable Development Agenda. These goals mainly have the intention of eradicating poverty, enabling the advancement towards a prosperous society, and preserving the natural resources of the planet.

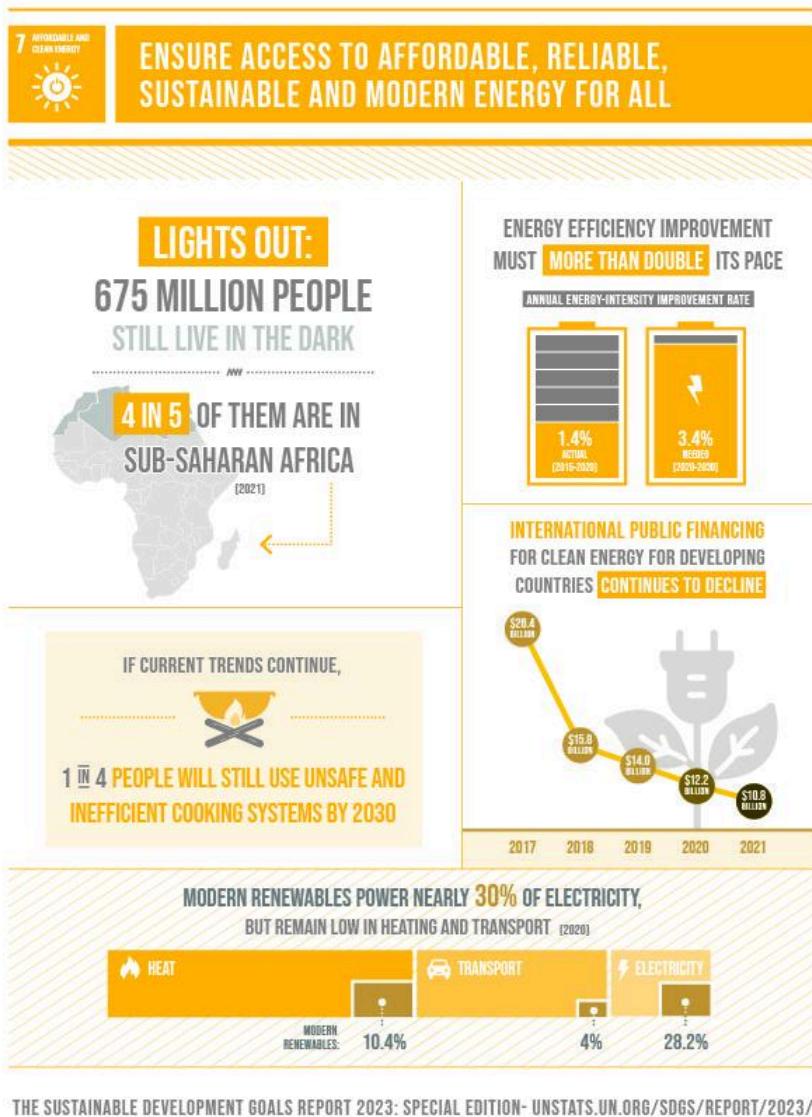
Each goal comes with a set of targets to be achieved within a certain time frame.

Achieving these goals requires an immense display of global cooperation and camaraderie between nations, civil society elements, and the private sector.



As visualized above, the Sustainable Development Goals are quite multifaceted, yet all of them ultimately have the same intention, eliminating all sorts of inequalities across the board. Although they all are interconnected, it is in our best interest to focus on a select number of Sustainable Development Goals, which are SDG #7 – Affordable and Clean Energy, SDG #9 – Industry, Innovation, and Infrastructure, SDG #11 – Sustainable Cities and Communities, and SDG #13 – Climate Action.

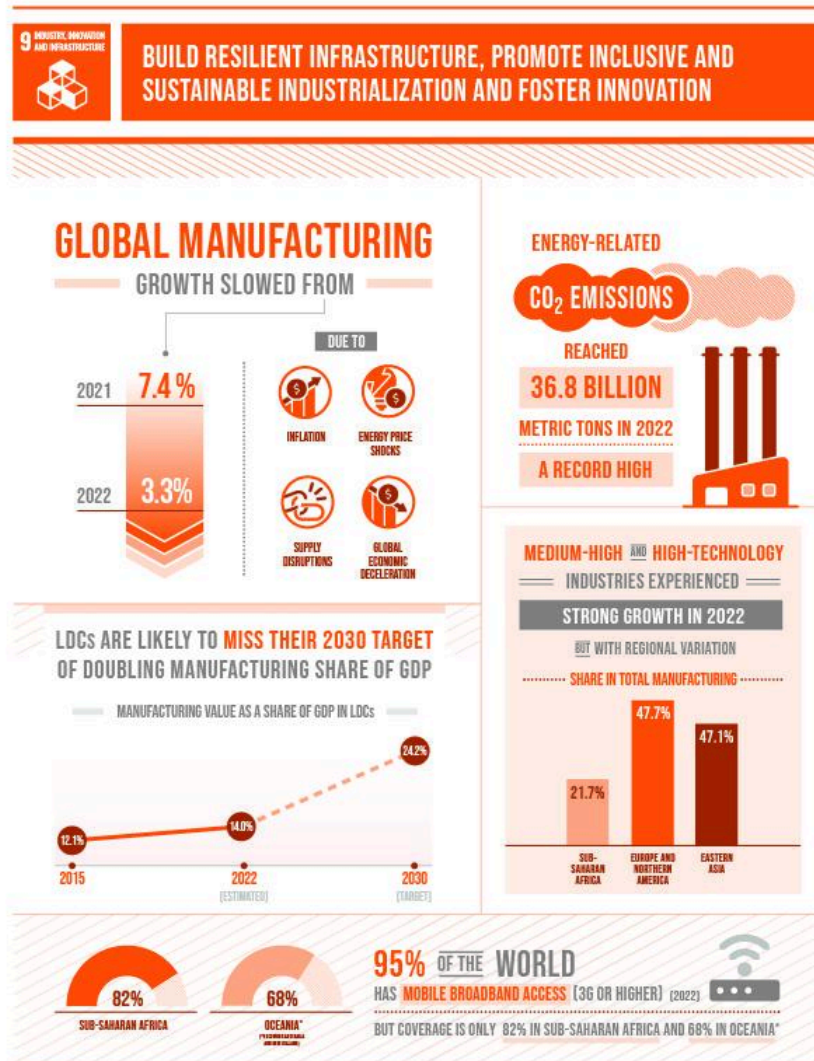
### **SDG #7 – Affordable and Clean Energy**



SDG #7 has 5 main targets, which are as follows: Ensuring universal access to affordable, reliable and modern energy services, substantially increasing the share of renewable energy in the global energy mix, doubling the global rate of improvement in energy efficiency, enhancing international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology, and expanding infrastructure and upgrading technology to supply modern and sustainable energy services for all in developing countries, in particular least developed countries, small island

developing States, and land-locked developing countries, in accordance with their respective programmes of support.

## SDG #9 – Industry, Innovation, and Infrastructure



THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2023: SPECIAL EDITION- [UNSTATS.UN.ORG/SDGS/REPORT/2023/](https://unstats.un.org/sdgs/report/2023/)

SDG #9 has 8 main targets, which are as follows: Developing quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all, promoting inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic

product, in line with national circumstances, and double its share in least developed countries, increasing the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets, upgrading infrastructure and retrofitting industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities, enhancing scientific research, upgrading the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending, facilitating sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States, supporting domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities, and significantly increasing access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2030.

## **SDG #11 – Sustainable Cities and Communities**



SDG #11 has 11 main targets, which are as follows: Ensuring access for all to adequate, safe and affordable housing and basic services and upgrade slums, providing access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons, enhancing inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries, strengthening efforts to protect and safeguard the world's cultural and natural heritage, significantly reducing



the number of deaths and the number of people affected and substantially decreasing the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations, reducing the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management, providing universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities, supporting positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning, substantially increasing the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels, supporting least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials.

### **SDG #13 – Climate Action**

13

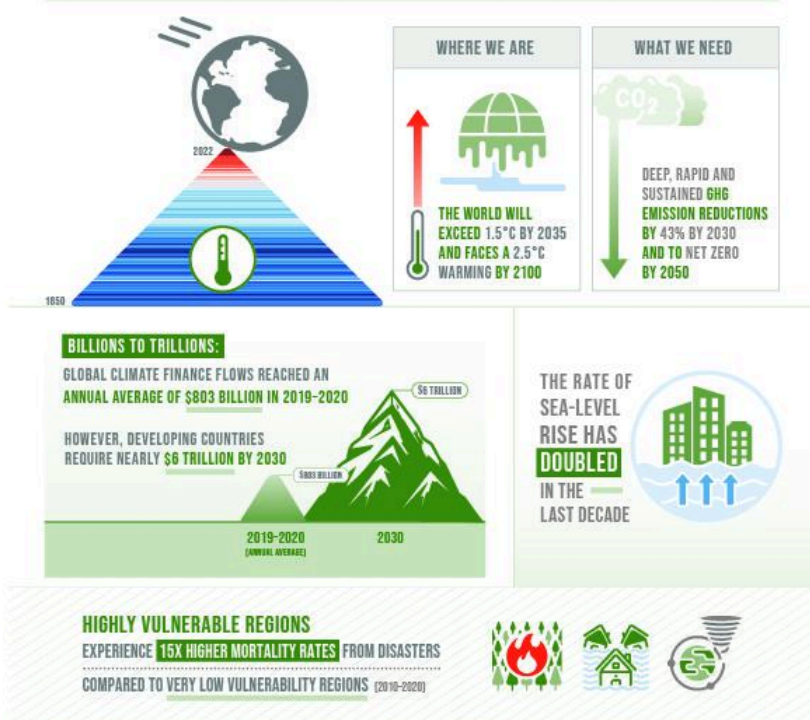
CLIMATE ACTION



## TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

### EARTH'S TIPPING POINT

STANDING AT THE BRINK OF CLIMATE CALAMITY



THE SUSTAINABLE DEVELOPMENT GOALS REPORT 2023: SPECIAL EDITION- UNSTATS.UN.ORG/SDGS/REPORT/2023/

SDG #13 has 5 main targets, which are as follows: Strengthening resilience and adaptive capacity to climate-related hazards and natural disasters in all countries, integrating climate change measures into national policies, strategies and planning, improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning, implementing the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions

and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible, promoting mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.

## **6.2) Objectives of the Global Stocktake**

The Global Stocktake mainly intends to keep the parameters set by the indicators of the SDGs in check as well as holding countries accountable for their respective contributions to nation-based sustainability targets called nationally determined contributions, commonly referred to as the short form NDCs.

Additionally, the Global Stocktake also intends to hold countries responsible for their global contributions to the long-term goals set by the Paris Agreement, including limiting global warming to well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit it to 1.5 degrees Celsius.

Moreover, the Global Stocktake aims to achieve accountability with a great respect to transparency to provide civilians with a very broad and comprehensive assessment of the efforts and progress of countries in addressing climate change.

Another objective of the Global Stocktake is to identify where previous implementations like the Paris Agreement and the Kyoto Protocol fall short in achieving the 2030 Sustainable Development Targets.

Finally, the Global Stocktake is also a platform in which countries can benefit from the experiences of one another, share technological advancements regarding climate change, and implement collaborative climate policies in regions.

### **6.3) Transparency and Accountability**

Although all objectives of the Global Stocktake are crucial in combating climate change, transparency and accountability is the single key element in the battle.

It is crucial for countries to share accurate data in a comprehensive manner regarding their actions towards climate change such as their respective greenhouse gas emissions and their carbon footprint. Also, the data provided must be documented, up to date, and easily accessible to third parties, such as non-governmental organizations and even civilians.

The convention uses a variety of metrics to thoroughly review and assess the data provided by countries. This includes technical expert reviews and multilateral assessment processes, which provide opportunities for other Parties to scrutinize and provide feedback on each country's climate efforts. Every sustainable development goal comes with its respective reference frames, dubbed indicators, to measure the contribution towards the goal.

It is also crucial to include civil society members in the process, therefore the Global Stocktake encourages the involvement of civil society, non-governmental organizations, academia, and other relevant actors in its deliberations, so that no voice goes unheard.

Moreover, a key factor for accountability is an evident culture of peer review and pressure among countries. The Global Stocktake encourages countries to learn from each other's experiences and hold each other accountable for meeting their climate obligations via the process.

## **7) Meeting 2025 and 2040 Greenhouse Gas Emission Targets**

### **7.1) Stark Reports by the United Nations and Other Relevant Agencies**

“Today’s report shows that governments combined are taking baby steps to avert the climate crisis. And it shows why governments must make bold strides forward at COP28 in Dubai, to get on track,” said the Executive-Secretary of UN Climate Change, Simon Stiell. “This means COP28 must be a clear turning point. Governments must not only agree what stronger climate actions will be taken but also start showing exactly how to deliver them.” Stiell continued. And as Stiell put it, countries need to commit to the further advancement of their efforts towards combating climate change as most countries are far off from their respective targets.

### **Greenhouse Gas Emissions**

According to a report[1] from the World Meteorological Organization, the atmospheric greenhouse gas emissions reached a record high, with globally averaged carbon dioxide (CO<sub>2</sub>) concentrations accounted to a total of 417.9 parts per million (ppm), methane (CH<sub>4</sub>) at 1923 parts per billion (ppb), and nitrous oxide (N<sub>2</sub>O) at 335.8 parts per billion (ppm), which respectively are 150%, 264%, and 124% higher than the levels of the pre-industrial era. However, what’s more concerning is that the rate of increase in greenhouse gas emissions, which also is still at its peak, slightly below the record-high increases recorded in 2021.

### **Temperature**

According to an another report[2], global mean near-surface temperature in 2023 was 1.45 degrees Celsius above the 1850-1900 average, which makes 2023 the warmest year recorded in the last two centuries. 2023 saw a substantial increase in surface temperature change as the past warmest year on record was 2016, with an increase of 1.29 degrees Celsius. Additionally, this previous decade saw the nine warmest years, as temperatures reached record-highs.

Although short-term climate drivers also had an effect in the increase from 2022 to 2023, the long-term increase paints a different picture. It is evident

that the increased concentrations of greenhouse gases in the atmosphere are the main cause for increased temperatures.

### **Ocean Acidification**

The ocean annually absorbs up to a quarter of total anthropogenic carbon dioxide emissions to the atmosphere. The constant increase in this absorption rate is causing an alteration in the carbonate chemistry, decreasing the pH of the seawater, which results in the acidification of oceanic waters. Ocean acidification affects most ecosystems and biomes to a degree, and results in habitat degradation, loss of biodiversity, and endangerment of fisheries and aquaculture.

According to the Sixth Assessment Report[3] (AR6) by the Intergovernmental Panel on Climate Change (IPCC), which is based on the indicator for the Sustainable Development Goal 14.3.1, the pH of the open oceans is the lowest in the last twenty-six thousand years, and the acceleration of the change is unprecedented. The report also states that the current coverage for the 14.3.1 target in 2030 is inadequate.

### **Cryosphere**

The cryosphere comprises the frozen parts of Earth – glaciers and ice sheets, sea-ice, snow, and permafrost. 2023 saw a decrease in both the Arctic and the Antarctic sea-ice extents, the fifth lowest ever to be recorded for the former and the sixth lowest for the latter. Glaciers were also largely affected. According to the preliminary data[4] from the World Glacier Monitoring Service (WGMS), the Swiss Glaciers lost 4.4% of their total volume, the second-highest ratio to be ever recorded, right after 2022, which saw a record-high 5.9% decrease. Combined, the data demonstrates that the Swiss Glaciers lost about 11% of their total volume due to climate change.

Additionally, both the Greenlandic and the Antarctic ice sheets continued to lose mass in the hydrological year 2022-2023. The summer season in 2023 was relatively intense, with major heat waves in July and August. The satellite records show that both ice sheets had the third-highest amount of mass loss due to melting ever recorded, after the extreme melting seasons of 2010 and 2012. However, one small hope is that in 2023, snowfall over Greenland exceeded the average loss of mass due to melting, which resulted in a net-positive change in the ice sheet mass.

## **7.2) Key Takeaways from COP-28**

COP-28 was held in Dubai, UAE, and was the biggest of its kind. The conference had a total of 85,000 participants, including 150 Heads of State and Government, and was particularly momentous as it marked the first global stocktake. The conference was also particularly important for the state of the battle against climate change as many important steps were taken.

However, the most important of them all was at the very end of the conference, which is an agreement that signalled the “beginning of the end” of the fossil fuel era. All members of the United Nations were called on to ratchet up climate change action before the end of the decade, to keep the global temperature increase limit of 1.5 degrees Celsius within reach. The acting COP-28 President Dr. Sultan Al Jaber said: “We have language on fossil fuel in the (COP) final agreement for the first time ever.”<sup>[5]</sup> It clearly points to the direction of travel in the energy transition, and that the scale and pace of change can’t be stopped or reversed.

## **7.3) Financial Concerns Regarding Green Energy Models**

Although green energy systems are bound to be for the greater good of both the public and the corporate scene, largely due to the environmental relief they provide over their fossil-fuel counterparts, from a purely economic standpoint, they do not seem to be the optimal solution until

the very long run. This situation creates an imbalance in the interest in green energy systems as the public opinion largely favors the transition whereas governments and the private sector are far less enthusiastic in comparison to their civilian counterparts.

The first challenge in green energy models is that most systems require state of the art technological infrastructure, which is extremely costly to implement. Moreover, after the initial cost, these systems are also much more costly to maintain in comparison to their fossil-fuel counterparts.

Another obstacle in the trend towards green energy models is that

## **8) Transition Towards Green Energy and Net-Carbon-Neutrality**

### **8.1) Recent Technological Advancements in Green Energy**

The development in green energy systems has been quite rapid, especially after the Paris Agreement. Newly emerging technologies proved themselves quite effective at reducing carbon emissions. Additionally, implemented systems turned out to be running much smoother as well, providing more power at reduced rates of fuel. These developments paved the way for better integration of green energy systems, dramatically increasing the amount of sustainable energy sources. Overall, it is evident that the energy scene went through a massive transformation, towards a brighter, greener future.

#### **Solar Power: Improved Solar Panel and Solar Cell Designs**

Halide perovskites are a family of materials that have shown potential for high performance and low production costs in solar cells. Perovskite solar cells have shown remarkable progress in recent years with rapid increases in efficiency, from reports of about 3% in 2009 to over 25% today. Bifacial solar panels, the reversible fashion accessory of the solar industry, are double-sided panels that absorb solar energy from both sides. Tests by



solar manufacturers have found these panels can generate 11% to 23% more energy than their monofacial or single-sided counterparts.

### **Wind Energy: Offshore Wind Farms**

The development of offshore wind farms, particularly in deeper waters, has expanded the potential for wind energy generation. Moreover, advanced wind turbine designs, such as vertical-axis turbines, are more efficient and can capture wind energy from any direction, increasing their usability in various environments.

### **Energy Storage: Redox Flow Batteries**

Unlike conventional batteries (which are typically lithium-ion), in flow batteries the liquid electrolytes are stored separately and then flow (hence the name) into the central cell, where they react in the charging and discharging phase. The durability of the stored energy allows for periods of many hours - such as nighttime - to be covered without electricity production from any source. Furthermore, raw materials are used that are common or at least don't have particular supply problems: for example, the most mature technology, and currently the most widely used industrially, features vanadium, of which there are significant known mineral reserves in Norway and Finland. The use of raw materials is further reduced on account of their easy recyclability, and this becomes a negligible issue in the case of emerging technologies based on iron, zinc or organic electrolytes. Last but not least, flow batteries can be compactly and modularly allocated, provide high safety as there is no risk of fire, and they have a service life of at least 20 years because there is minimal degradation.

### **Hydropower: Flexible Production Rates on Hydropower Plants**

Developing systems allow for hydropower to be harvested from even the smallest or the stillest water sources. Additionally, due to the utilization of

advanced pumping techniques, hydropower plants are much safer and the electricity production per hour can be altered to serve for a wider variety of loads on the grid.

### **Geothermal Energy: Better Utilization of Underground Resources**

Technological advancements allow for the utilization of low-temperature water reservoirs to be utilized for geothermal energy generation. Moreover, a new technique allowing the injection of heated water into rocks to create large fissures deep underground provides a much higher energy conversion rate for geothermal energy plants.

### **Bioenergy: Developments in Algae Processing**

Advances in algae cultivation and processing have made biofuels a more sustainable alternative to fossil fuels. Improved technologies for converting organic waste into biogas or electricity have made waste-to-energy systems more efficient and environmentally friendly.

### **Smart Grids: Better Integration of Renewable Energy Sources**

Smart grids are electricity networks that use digital and other advanced technologies to monitor and manage the transport of electricity from all generation sources to meet the varying electricity demands of end users. Smart grids coordinate the needs and capabilities of all generators, grid operators, end users and electricity market stakeholders to operate all parts of the system as efficiently as possible, minimizing costs and environmental impacts while maximizing system reliability, resilience, flexibility, and stability. Most of the technologies involved have already reached maturity, and so tracking investments provides insights on levels of deployment.

### **Hydrogen Economy: Electrolysis and Liquid Hydrocarbons**

Electrolysis using renewable energy sources to produce hydrogen is gaining traction as a clean fuel source for various applications, including transportation and industrial processes. Hydrogen may be the only link between physical energy from renewable sources and chemical energy. It is also the ideal fuel for modern clean energy conversion devices like fuel cells or even hydrogen engines. But hydrogen is not the ideal medium to carry energy from primary sources to distant end users, which is where liquid hydrocarbons come in. Liquid hydrocarbons allow a much-reduced loss of energy during transportation, therefore are much more efficient than their hydrogenic counterparts.

## **8.2) State Approach to Green Energy**

Governments use a variety of financial approaches to green energy systems.

### **Renewable Portfolio Standards**

A renewable portfolio standard (RPS) requires electric utilities and other retail electric providers to supply a specified minimum percentage (or absolute amount) of customer demand with eligible sources of renewable electricity.

Many states have adopted RPS requirements because they are an efficient, cost-effective, market-based approach to achieving renewable electricity policy objectives. RPS requirements can be used in both regulated and restructured electricity markets. States have tailored their RPS requirements to satisfy particular state policy objectives, electricity market characteristics, and renewable resource potential. Consequently, there is wide variation in RPS rules from state to state regarding the minimum requirement of renewable energy, implementation timing, eligible technologies and resources, and other policy design details.

## **Public Benefits Funds for Renewable Energy**

Public/system benefit funds are commonly supported through a very small surcharge on electricity consumption (e.g., \$0.002/kWh)[6] to ensure continued support for renewable energy and low-income energy programs. This charge is sometimes referred to as a “system benefits charge” (SBC). Public/system benefit funds commonly support rebate programs, loan programs, research and development, and energy education programs.

## **Output-Based Environmental Regulations**

Output-based environmental regulations (OBR) regulate emissions in relation to the energy output of a process (e.g., electricity generation or steam production) rather than the material inputs used in the process (e.g., fuel burned). OBRs use units of measure such as pounds of pollutant emitted per megawatt-hour generated (lbs/MWh) or pounds of pollutant emitted per unit of steam generated, rather than pounds of pollutant emitted per unit of fuel burned (lbs/MMBtu) or pollutant concentration (ppm).

## **Interconnection Standards**

Interconnection standards are processes and technical requirements that delineate how electric utilities in a state will treat renewable energy sources that need to connect to the electric grid. The establishment of standard procedures can reduce uncertainty and delays that renewable energy systems can encounter when obtaining electric grid connection in states that have not established interconnection standards.

## **Net Metering**

Net metering is an electricity billing mechanism that allows consumers who generate some or all of their own electricity to use that electricity anytime, instead of when it is generated. This is particularly important with

renewable energy sources like wind and solar, which are non-dispatchable (when not coupled to storage). Monthly net metering allows consumers to use solar power generated during the day at night, or wind from a windy day later in the month. Annual net metering rolls over a net kilowatt-hour (kWh) credit to the following month, allowing solar power that was generated in July to be used in December, or wind power from March in August.

### **Feed-In Tariffs**

A feed-in tariff is a policy mechanism designed to accelerate investment in renewable energy technologies by offering long-term contracts to renewable energy producers. This means promising renewable energy producers an above-market price and providing price certainty and long-term contracts that help finance renewable energy investments. Typically, FITs award different prices to different sources of renewable energy in order to encourage the development of one technology over another. For example, technologies such as wind power and solar PV are awarded a higher price per kWh than tidal power. FITs often include a "digression": a gradual decrease of the price or tariff in order to follow and encourage technological cost reductions.

### **Property Assessed Clean Energy (PACE)**

PACE is a financing option that attaches the obligation to repay the cost of renewable energy installations or energy efficiency retrofits to a residential property rather than an individual borrower. This mechanism encourages property owners to invest in clean energy improvements even if the payback period is longer than the owner intends to keep the property.

### **Financial Incentives**

Grants, loans, rebates, and tax credits are provided in most states to encourage renewable energy development.

### **8.3) The Role of the Private Sector in Green Energy Systems**

The private sector is a key driver in the transition to green energy. Its investments, innovation, manufacturing capabilities, and market competitiveness are essential for the growth and sustainability of the green energy sector. Collaboration between the private sector and governments is crucial to creating a more sustainable and environmentally friendly energy landscape.

Private sector companies are often at the forefront of green energy investments. They provide the substantial capital required for the development, installation, and maintenance of renewable energy infrastructure. This includes financing renewable energy projects, such as wind farms, solar arrays, and hydropower plants. Their investments facilitate the growth of the green energy sector.

Private sector firms are known for their capacity to innovate and develop new technologies. They invest in research and development to create more efficient and cost-effective green energy solutions. By improving renewable energy technologies, they can make them more accessible and competitive in the market.

Private companies are often responsible for manufacturing the equipment and components necessary for renewable energy production, such as solar panels, wind turbines, and energy storage systems. They play a critical role in scaling up production, reducing costs, and ensuring a steady supply of green energy technology.

Private sector energy companies often operate the distribution networks and provide energy services to consumers. They can play a pivotal role in integrating renewable energy sources into the existing energy infrastructure, ensuring a reliable and efficient supply of green energy to homes and businesses.

Private sector competition drives innovation and cost reduction. As companies seek to gain a competitive edge in the green energy market, they invest in improving the efficiency and affordability of renewable technologies, making them more attractive alternatives to fossil fuels.

The private sector's engagement in green energy projects leads to job creation. As the green energy sector grows, it generates employment opportunities in manufacturing, construction, maintenance, research, and development. This contributes to economic growth and a transition to a more sustainable economy.

Private companies are often multinational and have the resources and expertise to invest in green energy projects worldwide. Their global reach enables the expansion of green energy solutions, not only in developed countries but also in emerging economies, where access to clean energy is a critical need.

The private sector can collaborate with governments to establish policies and incentives that promote green energy adoption. Public-private partnerships can drive the development of favourable regulatory environments, subsidies, tax incentives, and other mechanisms that support the growth of the green energy sector.

Private sector companies can raise awareness and educate consumers about the benefits of green energy and energy efficiency. This can lead to increased demand for green energy solutions and a more environmentally conscious society.

Many private sector organizations are recognizing the importance of corporate social responsibility and are committing to reducing their carbon footprint. This commitment can drive internal efforts to adopt green energy and inspire other businesses to do the same.

#### **8.4) Evaluation of the Current Situation in Places of Interest**

## **Germany**

With new laws in place, land allocated and more generous subsidy schemes green-lit, 2024 will be decisive in determining whether Germany is on track towards meeting its ambitious 80% renewable electricity target in 2030. The fourth-largest economy in the world was once an early pioneer in the development of green technologies. A mid-2010s slowdown after the initial boom resulted in the “Energiewende” losing some of its luster.

By 2030, the country should consume 600 terawatt hours of renewable electricity, 80% of its total, the government coalition agreed. The laws designed to achieve the necessary renewables boost were crafted in great haste throughout 2022. At the heart of the government’s efforts are the overhaul of the renewable energy law (EEG) as well as a new onshore wind law and the offshore wind law, termed “the biggest reform in decades.” Renewables are now in the “overriding public interest,” limiting lawsuits against their development. Permitting, often cited as a key bottleneck, is expected to speed up as well. Citizen’s projects – once a workhorse of renewables expansion, allowing residents to share in the profits – of up to 18 MW and solar projects of up to 6 MW will be permitted. To aid their development, they can apply for upfront funding support of up to €200,000 and be exempt from most administrative restrictions.

The government-subsidized price offered for onshore wind power is also set to increase by 25% as of 1 January<sup>[11]</sup>, in a bid to reflect higher production costs of wind turbines and to counter continued low participation in government renewables tenders.

## **United States**

The Biden-Harris administration is taking an all-of-government approach toward its ambitious renewable energy goals that will create jobs to support families, boost local economies, and help address economic injustice.



As directed by President Biden's Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, Interior (the USA's ministry of internal affairs) has partnered with other federal agencies to increase renewable energy production on public lands and waters—including a commitment to deploy 30 gigawatts of offshore wind by 2030 and a target goal of permitting at least 25 gigawatts of onshore renewable energy by 2025.

To facilitate this transition to clean energy and meet their ambitious goals, the Department has announced a new offshore wind leasing strategy, which includes potentially holding up to seven new offshore wind lease sales by 2025. This strategy provides two crucial ingredients for success: more certainty for industry, and transparency for our stakeholders and ocean users.

## **United Kingdom**

Renewables produce more than 20% of the UK's electricity, and EU targets means that this is likely to increase to 30% by 2020. To achieve this, a range of technologies will need to be used, such as biomass power stations or hydropower systems. Additionally, the UK is very well placed to take advantage of wind power, with some of the best conditions in Europe and high average wind speeds. Both onshore and offshore wind farms are an important part of where the UK sources its energy. The UK has invested significantly in offshore wind and has installed as much capacity as the rest of the world combined.

The UK also has multiple policies that are designed to incorporate civilians into the grand scheme of things and help maintain the commitments made by major energy suppliers:

The Renewable Obligation (RO) is intended to encourage renewable electricity generation for large scale installations. It requires suppliers to source an ever increasing amount of the electricity from renewable sources. The RO rewards renewable output over the lifetime of a project.

The Feed-in Tariff (FiT) is designed to support small scale renewable installations up to 5 MW. Through FiTs, generators are paid a tariff for every unit of electricity they produce. Any electricity not used on site can also be sold back into the Grid, and generators are paid extra to do this.

A new scheme to support renewables and other low carbon technologies is currently being developed through Electricity Market Reform. The scheme will be called a Feed in Tariff with a Contract for Difference (CfD).

## **China**

China's approach to green energy has been characterized by a combination of government policy, market incentives, and technological innovation.

The Chinese government has made a commitment to reducing the country's reliance on fossil fuels and increasing the use of renewable energy sources. This commitment is enshrined in the country's Five-Year Plans, which outline the government's economic and social development goals. For example, the 13th Five-Year Plan (2016-2020) set a target of generating 15% of the country's energy from non-fossil fuel sources by 2020, and the 14th Five-Year Plan (2021-2025) aims to increase this target to 20%.

The Chinese government has also implemented a range of policies to encourage the development and use of renewable energy technologies. These include subsidies for renewable energy projects, feed-in tariffs that guarantee a fixed price for renewable energy generated by small-scale projects, and tax incentives for companies that invest in renewable energy.

Moreover, China has invested heavily in developing new technologies for renewable energy generation and storage. For example, the country is a world leader in the production of solar panels and wind turbines, and it is

also investing in new technologies like hydrogen fuel cells and battery storage.

## **Japan**

In the wake of the Fukushima nuclear disaster in 2011, Japan has set ambitious targets for renewable energy development. The government aims to achieve a 22-24% share of renewable energy in the country's electricity mix by 2030.

To achieve this, the government has implemented a range of policies to promote the development and use of renewable energy, such as subsidies for renewable energy projects, and tax incentives for companies that invest in renewable energy. Japan has a liberalized electricity market. This has led to a shift towards renewable energy, as the cost of renewable energy technologies has decreased over time, making them more competitive with fossil fuels. In addition, there has been a growing trend of companies and investors moving towards sustainable investments and divesting from fossil fuels.

Japan is a leader in developing new technologies for renewable energy generation and storage. For example, the country has significant potential for solar energy, and it has been investing in developing more efficient and cost-effective solar panels. Japan is also developing new technologies for energy storage, such as large-scale batteries and hydrogen fuel cells.

## **Russian Federation**

Russia's approach to clean energy has been relatively limited, and the country remains heavily dependent on fossil fuels, particularly oil and natural gas. However, there have been some recent developments and initiatives aimed at promoting the use of clean energy sources.

The Russian government has set some targets for increasing the use of renewable energy, such as aiming to generate 5% of the country's

electricity from renewable sources by 2024. To achieve this, the government has implemented some measures to support the development of clean energy, such as feed-in tariffs for renewable energy projects and subsidies for energy-efficient buildings.

Russia's electricity market is largely dominated by state-owned energy companies, which have traditionally focused on fossil fuel generation. However, there has been a growing interest in renewable energy among some private companies and investors, particularly in the area of wind power.

Russia has some significant resources for renewable energy, particularly in the areas of hydroelectric and wind power. The country has been investing in developing new technologies for these energy sources, such as high-capacity wind turbines and advanced hydroelectric generators.

## **Saudi Arabia**

Saudi Arabia's approach to clean energy has been evolving in recent years, as the country seeks to diversify its energy mix and reduce its dependence on fossil fuels. In 2019, Saudi Arabia launched an ambitious renewable energy program called the National Renewable Energy Program (NREP). The program aims to add 58.7 GW of renewable energy capacity by 2030, with a focus on solar and wind power.

Additionally, the government has also implemented policies to support the development of clean energy, such as feed-in tariffs for renewable energy projects and tax incentives for companies investing in renewable energy. Saudi Arabia's electricity market is dominated by the state-owned utility Saudi Electricity Company, which has traditionally focused on fossil fuel generation. However, similar to the Russian Federation, there has been a growing interest in renewable energy among private companies and investors, particularly in the areas of solar and wind power.

Moreover, Saudi Arabia also has significant potential for renewable energy, particularly in the areas of solar and wind power. The country has been investing in developing new technologies for these energy sources, such as large-scale solar projects and advanced wind turbines. In addition, the country is exploring the use of other clean energy sources such as nuclear and hydrogen power.

## **Sweden**

Sweden has been a global leader in the transition to clean energy, with a strong focus on reducing greenhouse gas emissions and promoting the use of renewable energy sources. Sweden has set ambitious targets for reducing greenhouse gas emissions, including a goal of net-zero emissions by 2045. The country has implemented a range of policies to promote the use of clean energy, such as a carbon tax, a renewable energy certificate system, and financial incentives for energy efficiency improvements.

Sweden's electricity market is open to competition, which has encouraged the growth of the renewable energy sector. Wind and solar power are the fastest growing sources of electricity in Sweden, and there is a strong interest in other clean energy sources, such as biomass and geothermal energy.

Sweden has a long history of technological innovation in the energy sector, with companies such as ABB, Ericsson, and Volvo developing new technologies for clean energy. The country is also home to several research institutions and startups focused on developing new clean energy technologies.

### **8.5) Globalization of Markets and Its Effects on Energy Trade**

Globalized markets massively transformed the landscape for energy trade. Due to constant efforts by developed countries, many multi-national and/or large-scale regional energy grids were implemented. Additionally, a

trans-Atlantic energy grid was formed to connect North America to Europe in terms of energy trade. The newly formed network also doubled as development sites for offshore multi-purpose wind turbines.

Global markets now allow for countries to directly import both energy and means of energy production not only from neighbouring countries but also from across the globe. This situation creates a very competitive energy market, which essentially serves to drive down the prices for both direct-to-consumer energy provisions and importing clean energy production means like biofuel.

This much competition in the market also requires most large-scale producers to invest heavily both in research and development efforts and in customer satisfaction services as it becomes challengingly difficult for any company to thrive in such an environment where the respective market share they hold diminishes considerably day-by-day.

All these combined create an environment in which consumers are greatly valued and where progress is the sole focus of the corporate world. For example, in Scandinavian countries like Denmark, electricity production is so widespread and efficient that at times, it literally costs to have excess electricity as the load on their grids exceed the optimal amounts.

Therefore, during peak hours, any and all sorts of electricity provisions in select parts of the country are totally free of charge to any consumer, whether it be a large-scale corporation or a single-family home.

In conclusion, it is fairly clear that the globalization of markets has had a very profound positive impact on energy trade. However, it is extremely important for governments, the private sector, and the civilians alike to further alleviate this transition from regional energy markets to a singular, global energy hub via all means possible.

## **9) Questions to be Answered**

- What are the negative effects of climate change on the environment? How can we categorize them into threat-levels? Or would it be better to not categorize them at all and try to fix them simultaneously?
- What does the Global Stocktake mean for the general public? How can we further educate civilians on the matter?
- How are the projections on gas emissions and carbon trade towards the next Global Stocktake? What legislations can be implemented to accelerate the progress?
- Why is transparency and accountability so important in the Global Stocktake? What else can be done to further improve public access to the data provided by countries regarding climate change? How can we improve public awareness around such concepts - is it possible to educate citizens to have a better understanding of the data provided?
- What ways of achieving net-carbon-neutrality are already utilized? What other possible ways are there, and how effective will they be based both on economic and scientific models? What is the best way to balance progress in combating climate change and not hindering economic welfare?
- What are the recent advancements in green energy systems? How can they be implemented into already existing infrastructure? What difficulties can arise - whether it be logistical or financial - during the implementation progress?
- What are the past implementations regarding climate change? What have they achieved so far? What would be the best metric to evaluate the progress made on the United Nations Sustainable Development Goals?

- What role does the private sector play in the transition towards green energy systems? What financial concerns seem to hinder the transition period? What can be done to alleviate financial burdens to allow for a smoother transition?
- What steps did signatory countries take regarding climate change? How can international cooperation be further encouraged to allow for a global transition towards net-carbon-neutrality?

## **10) Further Reading and References**