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Climate Change Training Module Series 3

EUROPEAN UNION CLIMATE POLICY

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EUROPEAN UNION CLIMATE POLICY

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EUROPEAN UNION
CLIMATE POLICY

CONTENT

ABBREVIATIONS

EU	European Union
EEA	European Environment Agency
EIONET	European Environment Information and Observation Network
CCS	Carbon Capture and Storage
CF	Cohesion Fund
COP	Conference of Parties
EAFRD	European Agricultural Fund for Rural Development
EEA	European Environment Agency
ECCP	European Climate Change Programme
EFSI	European Fund for Strategic Investment
EGF	European Globalisation Adjustment Fund
EMAS	Eco-Management and Audit Scheme
EMFF	European Maritime and Fisheries Fund
ERDF	European Regional Development Fund
ESF	European Social Fund
ESF+	European Social Fund Plus
ETS	Emissions Trading System
GCCA+	Global Climate Change Alliance Plus
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GMES	Global Monitoring for Environment and Security
GMO	Genetically Modified Organizations
ICAO	International Civil Aviation Organisation
INDC	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
JRC	Joint Research Centre
LULUCF	Land Use, Land Use Change and Forestry
MFF	Multiannual Financial Framework

NECP	Integrated National Energy and Climate Plan
OECD	Organization for Economic Co-operation and Development
QELRC	Quantified Emission Limitation or Reduction Commitment
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNCED	United Nations Conference on Environment and Development
SDGs	Sustainable Development Goals
SEIS	Shared Environmental Information System
SME	Small and Medium Enterprises
WFD	Water Framework Directive

EXECUTIVE SUMMARY

Europe is one of the geographies which will suffer the most from the impacts of climate change on the earth. Climate change causes significant impacts in many countries and region of Europe, with consequences being seen more frequently on economies and ecosystems including the human life at the top.

Whereas the West, Central and Eastern Europe is more affected from floods due big rivers in the region, hurricanes, avalanches and landslides are frequently experienced with the effect of high mountains in Alpines and Pyrenes in West Europe and droughts and forest fires in South Europe. More drought, heat waves and dry periods in a significant part of Mediterranean Europe could increase the length and severity of fire season and the areas which are under possibility and risk of big fire, possibly increasing the deforestation. With the impact of urban area distribution and the increase of population, European cities will continue to suffer different climate effects such as heat waves, floods and droughts.

Whereas combatting climate change has started as a global struggle carried out under the roof of United Nations in the period following 90s in the past century, the European Union has been one of the leading institutions of the efforts in this field. EU, which has an undeniable contribution in global greenhouse gas emissions, is one of the actors with the most enthusiasm towards struggling against climate change as indicated before.

European Union and the Members States are the parties to United Nations Framework Convention on Climate Change, Kyoto Protocol and Paris Agreement, which are currently in force.

The international conventions in question have become a part of EU legal system.

The purpose of Paris Agreement is the transition to an economy where low carbon resources are effectively used and making fundamental changes in sector areas such as energy, technology, economy and finance with an integrated approach. The meaning of this expectation from the point of EU is that combatting the climate change in Europe will open the door to important opportunities particularly in the fields of employment and growth. Transition to low carbon economies contributes in the target of EU to be global leader in the field of energy and enlivens the investments and innovations in the field of renewable energy.

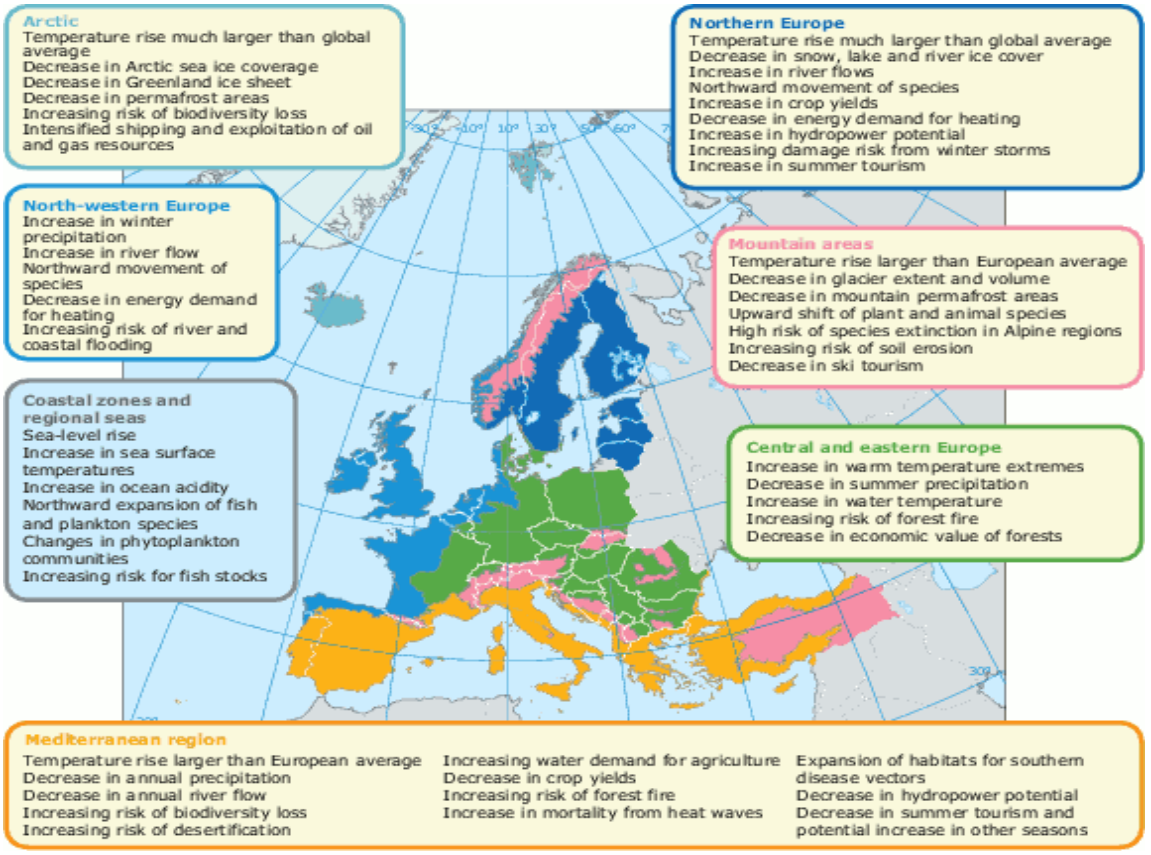
Within this framework, EU has been determining and implementing strategies for long years. Within the scope of climate change there are numerous EU Commission, EU Council and EU Parliament decision and regulations that have been carried out for energy, housing and service, transportation, industry, agriculture and forestry and waste management sectors. The target here is to integrate the policies related to transition period which will be resistance against climate change and low carbon, with the policies of all sectors related to climate change in the European Union.

With the "Long Term Vision for a Climate-Neutral Europe as of 2050", today EU preserves its position to strengthen and also facilitate the climate actions at global level as well as regional level.

1. CLIMATE IMPACTS CHANGE IN EUROPE

Climate change currently causes many impacts on almost all geographical regions of Europe. All member countries of the European Union are in a sensitive position, however some regions are under more risk compared to other regions. Different climatic characteristics in various regions of Europe exposes the continent to different risks. Whereas the West, Central and Eastern Europe is more affected from floods due big rivers in the region, hurricanes, avalanches and landslides are frequently experienced with the effect of high mountains in Alpines and Pyrenes in West Europe and droughts and forest fires in South Europe.[1] European Information and Observation Network on Environment/EIONET produces comprehensive data and makes assessments on the expectations and vulnerabilities of different regions against the impacts of climate change on Europe, and this information is shared with policy makers at national level in EU and member countries.

Figure 1: Climate Change Impacts Foreseen Overall Europe[2]



[1] https://www.tsb.org.tr/iklim-degisikligi-ve-dogal-afetlerin-sosyal-ve-ekonomik-etkilerinin-azaltilmasi.aspx?pageID=714

[2] https://ec.europa.eu/clima/policies/adaptation/how/territorial_en

Reports published by European Environmental Agency/EEA, European Environmental Information and Observation Network demonstrate that, under the light of information and data, climate change will have negative impacts on biodiversity, ecosystems, earth and water and other important resources in Europe, human health, energy and agricultural production, tourism, fishery, infrastructure, waste etc. Researches demonstrate that as the resistance of European ecosystems against climate change decreases, the capacity to cover the basic needs such as food, clean air and water will also decrease.

Europe suffered extreme temperature waves in the four of the recent five years. It is established by the researches that very high/extreme temperatures increase the risk of drought and forestation in the south sections of Europe. European cities are under risky conditions in terms of supply of water and other basic natural resources. Water scarcity and drought has direct effects on the highly urbanized and populated settlements as well as on those who live in the southern coastal cities of Europe together with other impacts related to climate change.

Researches demonstrate that there will be less precipitation in many regions of Europe and the increasing temperatures will lead to more frequent and intense summer droughts. More drought, heat waves and dry periods in a significant part of Mediterranean Europe could increase the length and severity of fire season and the areas which are under possibility and risk of big fire, possibly increasing the deforestation. Mediterranean region has been experiencing these impacts by now and the Central Europe will incur more extreme droughts in the coming ten years. Today there is the possibility that the risks and disasters in question could be experienced in the forest regions which have not yet been exposed to fires today.

40% of the clean water of Europe comes from Alpines. The source of clean water is mostly the mountainous areas. Changes in the snow and glacier dynamics on mountains and also changes in the precipitation structures could lead to decreases in water supply overall Europe.

Changes were observed in the river flows in Europe. It is inevitable that the decreasing water sources will have negative impact on the hydroelectric energy production in Europe.[3] As the climate change causes the occurrence of floods and increase of their frequencies overall Europe, it is indicated that the river floods which are already common natural disasters in Europe will have negative impact on line and cause losses in economic terms. Researches demonstrate that as the rains flow directly to river systems at extreme rates, this will case more sudden flood risk on mountainous regions and their downstream directions. It was estimated that the damage which will occur due to river floods in future in Europe will reach to 112 billion Euro annually; today this amount is 5 billion Euros.[4]

Around one third of the European Union population lives within 50 kilometers of the coasts. It could be seen that these regions produce more than 30% of

[3] "Climate Impacts in Europe: JRC PESETA III Project, Final Report", "JRC Science for Policy Report, 2018". (JRCPESTA III Report was prepared by experts in the fields of economy, biology, physics and engineering for calculating the physical impacts and economic costs of climate change in Europe, and the impacts of climate change in Europe were evaluated under 11 impact categories. These are mortalities related to coastal floods, river floods, droughts, agriculture, energy, transportation, water sources, loss of habitat, forest fires, labor efficiency and heat).

[4] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank/A Clean Planet for All, A European Strategic Long-Term Vision for A Prosperous, Modern, Competitive and Climate Neutral Economy, European Commission, Brussels, 28.11.2018 COM (2018) 773 final.

the total GDP of the Union and also the economic value of the sea products at a distance of 500 meters from the seas in Europe is calculated to be between 500- 1.000 billion Euro, and this demonstrates that it is an important element of threat for Europe.[5] The flood and erosion risk will increase on coastal areas with the increase in the sea level that arises in connection with climate, and this will have important consequences on infrastructures, coastal enterprises, sea and coastal systems.

An increase in the salty soils on coastal areas is expected in Europe as a result of intrusion of salty water from sea side due to increasing sea levels and low river discharges.

One of the fundamental parameters that determine the general health of aquatic ecosystems is the water temperature. (Aquatic organisms have a specific temperature interval which they can tolerate). Climate changes in Europe have increased temperatures of rivers and lakes in the current situation, this has decreased ice coating in interior waters and accordingly negatively affected the water quality and clean water ecosystems.

The impact of climate change on the organic carbon stock of earth could be the changing atmospheric CO_2 concentrations increasing temperatures and the changing precipitation regimes. Yet Soil Organic Carbon (TOK) is one of the most sensitive resources that need to be protected in land ecosystems and it has the potential of sequestering important amount of carbon if managed well. When the sustainable use of soils is ensured in this way, the undesired impacts of climate change decrease and adaptation becomes hard.[6]

It is known that the increase of water surface temperatures due to climate change, acidification of seas, shifts in the currents and wind structure will lead to important changes on the physical and biological structure of oceans. Changes in temperatures and ocean circulation also have the potential to change the geographical fish distribution. Increasing sea temperatures may also lead the foreign species to spread to areas which they did not live before.[7] It is foreseen that such changes will cause important socio-economic consequences for many regions in Europe.

Besides, the behaviours and phenology of animal and plant species change together with the increasing temperature (Phenology = branch of science which studies various development stages that occur in the development cycles of living things). Whereas this situation leads to the increase in the number of insects and invading species in an extraordinary way, leading the loss of productivity in agriculture and stockbreeding, endangering their services to the ecosystem (for example water reservoirs, natural erosion control etc.). The hottest days and nights that have been started to be observed nowadays in Europe and the frequent and high temperature extremities such as heat waves affect human health, causing an increase in the cases of mortality arising from this situation. In addition to the impact on human health of the increasing temperatures, the global heating threatens the distribution and diversity of many plant and animal

[5] "Climate Impacts in Europe: JRC PESETA III Project, Final Report", "JRC Science for Policy Report , 2018".

[6] "Soil Organic Carbon Project/ Technical Summary", T.C. Tarım ve Orman Bakanlığı, Çölleşme ve Erozyonla Mücadele Genel Müdürlüğü, TÜBİTAK BİLGEM/YTE, 2018, Ankara, page: 3-4.

[7] For example, it is scientifically foreseen that the ocean acidification will have an impact on organisms that release calcium carbonate (Resource: "Climate Impacts in Europe: JRC PESETA III Project, Final Report", "JRC Science for Policy Report , 2018".

species in Europe and this situation is particularly seen in the mountainous regions.

When considered from the point of economic sectors, Europe is affected from climate change at different perspectives. Buildings could not be sufficiently resistant against climate due to their infrastructure designs (lack of resistance against storms etc.) or their locations (such as areas open to floods, landslides, avalanche risks). This situation highlights these sectors in terms of being prepared for climate change. The impacts of Europe's climate change for buildings and infrastructures could demonstrate difference between regions. Even so that in some areas, beneficial impacts could be seen (for example less snow improves the traffic conditions in transportation).[8]

With the impact of urban area distribution and the increase of population, European cities will continue to suffer different climate impacts such as heat waves, floods and droughts. The overflow of Elbe River, which is one of the big rivers of Central Europe,[9] in 2002 or the urban drainage flood that experienced in 2011, are among the examples from recent past that demonstrate that European cities are highly vulnerable to climate change. Conditions such as the intensification of population on the cities at a significant level, and the continuation of urban land acquirements demonstrate that the urban population and the aging population living in the cities will have less resilience against climate in the future. In order to overcome these impacts, practices such as urban design and management, green infrastructure appear as important solutions in many EU countries today.

The threats of climate change in European energy system are currently being experienced and there are strong scientific estimations to the direction that these threats will increase. For example, it is expected that the climate change will decrease heating demand in North and North West Europe and increase the energy demand significantly in South Europe, and it is foreseen that these conditions will increase the summits in electricity supplies during summer time. Additional increases to be experienced in temperatures and droughts will increase the demand towards air conditions during summer times. Another important problem is that the increase of frequency and magnitude of extreme weather conditions in Europe will cause risks in open energy transmission and distribution infrastructure systems, stations and transformers.

It is foreseen that the climate changes will bring together the uncertainties from the point of weather conditions overall Europe and that this situation will have direct negative effect on the renewable energy production in the long run. Looking at the examples such as less solar or wind energy being present in regions which are expected to be more in normal conditions or products used for supplying energy from biomass negatively affecting the production process due to excessive heating and drought from this perspective, these are considered as expected risks.

It has been evidenced for long with scientific estimations that climate change and climate variability will have important impacts on agricultural production in terms of both the crop efficiencies and the location where different products would be grown. Depending on high temperatures, water scarcity, extreme weather conditions, precipitation

[8] https://ec.europa.eu/clima/policies/adaptation/how/sectors_en#tab-0-0

[9] Elbe springs out from North East of Chechia, passes from Germany territories and reaches to North Sea.

structures and relevant crops, it is expected that these will cause lower product yields, higher efficiency variability and the decrease of areas suitable for growing products in the long run overall Europe. Southern regions of Europe are the locations which will be affected by climate change the most and it is expected that negative impacts of climate change will be experienced in general in the agricultural sector. When considered from the point of positive impacts and the opportunities to arise, it is foreseen that the crop season in Europe is extending and earlier growth in spring months and longer growing conditions in autumn are expected for the crops and it is considered that these impacts will also provide opportunity for the expansion of crops to Northern European regions which were previously not suitable for growing. However, it has been demonstrated with scientific estimations that pests and diseases will increase depending on climate change in these areas as well as other negative impacts, depending on the decrease of nutrients and the decreasing soil organic materials.

The impacts on forestry depending on climate change include the risks of increasing drought, storms and fires (abiotic), pests and diseases (biotic), and all of these lead to distortions in the health of European forests. The impact of forest fires is strong on the already damaged ecosystems in the South Europe and this situation is expected to get worse in the future, and seasons with longer and more severe fires are expected in South Europe. The future scientific estimations related to the impacts of climate change are in the direction of decrease of forest growth in South Europe and increase in Northern Europe. In connection with the threats increasing on the changing tree species and special plant communities, it is expected that the biodiversity of forests will change overall Europe. EU Commission has adopted a new comprehensive Declaration in order to preserve the forests that host 80% of the biodiversity on land areas and support the livelihood for around 25% of the world population.[10]

Biodiversity, which is evaluated at three levels such as genetic diversity, species diversity and ecosystem diversity, is directly and/or indirectly negatively affected at all three levels from the impact of climate change on nature. Taking into account the intense pressures on biodiversity – changes in the use of lands and other resources, extreme use, pollution, habitat change, invading species – and the impacts of climate change calculated for today and future, scientific evidences have become stronger that the planet could experience the *Sixth Annihilation* process.[11] It is foreseen that European ecosystems will lose resilience against climate change and its capacity to meet the basic needs such as food, clean air, water and erosion control, namely the biodiversity, will decrease.

Ophelia Hurricane, which hit in 2017 and was one of the disasters experienced in Europe due to climate change, was the first East Atlantic Hurricane that reached to Ireland in the history. Also it is known that the Leslie Hurricane in 2018 lead to significant devastations in Portugal and Spain. It is expected that the frequency and intensity of some types of extreme weather conditions will cause changes and disasters as a result of climate change.

[10] TÜSİAD EU Representation, Weekly Bulletin, 29 July 2019, Brussels (https://bxl.tusiad.org/media/com_acymailing/upload/tusiad_bxl_22_07_2019.pdf
https://ec.europa.eu/environment/forests/eu_comm_2019.htm).

[11] Prof. Dr. Doğanay Tolunay, "İklim Değişikliğinin Ekolojik Sistemlerdeki Yeri", İklimİN Eğitim Modülleri Serisi 5, T.C. Çevre ve Şehircilik Bakanlığı, 2019, Ankara, Yönetici Özeti.

When considered from this point of view, the importance of insurance sector has been gradually increasing in the mitigation of social and economic impacts of natural disasters and climate change. Climate change is closely affecting many branches of the insurance sector such as property insurances, agriculture insurances and health[12] insurances[13] bringing together also a series of opportunities and threats. It is foreseen that this impact will be felt clearer as a result of rising water levels and floods in the coastal regions in Europe, and when considered from the point of list of losses, the commodity insurances are at the forefront here. Besides, it was demonstrated by statistics that the temperature increase in Europe caused an increase in traffic accidents. For that reason, it should be indicated that climate change will affect motor vehicle insurances. European insurers have been continuing their actions for around ten years for mitigating the negative economic impacts of climate change and ensuring that economic actors undertake responsibility on this issue. It is aimed at increasing the level of knowledge and awareness of policy makers for encouraging and finding financing solutions for research and disaster prevention methods of insurance sector, and there are good practice examples which the sector-public partnership have accomplished in this direction.[14] The problem here is that the impacts of climate change in the sectors which are most vulnerable in the long run could increase social disintegrations indirectly, because it is apparent that the insurance premiums will be unable to be covered for a high part of the population.[15]

Climate change could lead to positive or negative economic consequences for the regions where tourism is important in Europe. It is expected that the adequacy of South Europe for tourism will decrease significantly in summer months due to extreme temperatures, however will increase in other seasons. It is estimated that Central Europe will increase its tourism attraction during the year. However, it is foreseen that the decreases seen in snow cover will negatively affect the winter sports industry in many regions of Europe.

These evaluations demonstrate that climate change could lead to important consequences in Europe on the productivity of economy, infrastructure systems, food production, public health, biodiversity, ecosystems and also political stability. For example, disasters related to extreme weather conditions lead to an economic damage of 283 billion Euro, which could be considered as a record in the EU. It is foreseen that the disasters depending on climate change by the year 2100 will affect two thirds of European population and this rate is 5%.[16] Scientific estimations demonstrate that 16% of the Mediterranean climate belt of Europe could become drought by the end of 21st century. For that reason, it is indicated that in some of the South Europe countries, the business areas operating in open air will decrease by 10-15% compared to current situation.[17]

[12] The increase in forest fires, negative impactsof flood and drought on crops and the decrease in the production capacity directly affect the agriculture insurances.

[13] The temperature averages that have been above the 20th century average in Europe has started to closely affect the insurance branch. Whereas there is an increase in the number of people applying to hospitals due to high temperatures in Europe, infant mortalities due to early births connected with temperature have also increased.

[14] https://www.tsb.org.tr/iklim-degisikligi-ve-dogal-afetlerin-sosyal-ve-ekonomik-etkilerinin-azaltilmasi.aspx?pageID=714

[15] https://ec.europa.eu/clima/policies/adaptation/how/sectors_en#tab-0-0

[16] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank/A Clean Planet for All, A European Strategic Long-Term Vision for A Prosperous, Modern, Competitive and Climate Neutral Economy, European Commission, Brussels, 28.11.2018 COM (2018) 773 final.

[17] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social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2. EU'S COMMITMENTS TO GLOBAL FIGHT AGAINST CLIMATE CHANGE

The most important and first global response in struggling against global climate change was with the United Nations Framework Convention on Climate Change/UNFCCC which was adopted and opened for signature in the United Nations Environment and Development Conference which was held in Rio de Janerio in 1992. UNFCCC, ultimate goal of which was defined as "stopping the greenhouse accumulations in the atmosphere at a level which will prevent hazardous anthropogenic impacts on the climate system", has imposed joint commitments on all Parties for mitigating greenhouse gas emissions and stopping climate change and reducing its impacts by taking into account the common but differentiated responsibilities of countries, national and regional development priorities, objectives and special conditions (Party = country government or a regional economic integration organization such as European Union which is a party to United Nations Framework Convention on Climate Change).

European Union has been in an early and strong position in the development of global climate policies with the target of CO_2 emission mitigation within itself as set out in 1990 in the Luxembourg Environmental and Energy Council when it was in the preparatory process for UNFCCC before 1992.[18]

The Community[19], has become Party to UNFCC on 21 March 1993.

The Kyoto Protocol, which was adopted in 1997 as a means of implementation of the Convention in order to strengthen the countries in the Annex 1[20] list that are party to UNFCCC (This list is listed as Annex B Parties in Kyoto Protocol) to fulfill their obligations in relation to mitigation of greenhouse gas emissions; regulates the mitigation in total of 5% compared to 1990 periods in 2008 – 2012 obligation period, of anthropogenic carbon dioxide (CO_2) equivalent greenhouse gas emissions, either on themselves or in common, in accordance with the emission limitation and mitigation obligations that have different values for each country .

The obligation of European Union under Kyoto Protocol was determined as reducing the emissions covering a total of six greenhouse gases (CO_2, dinitrogenmonoxide (N_2O), methane (CH_4), hydroflourocarbons (HFC's), perflourocarbons (PFCs) and sulphure hexaflouride (SF6) below 8% compared to 1990 levels in 2008-2012 first period.

The EU target is 8% emission mitigation as opposed to the first period target of Kyoto Protocol (5%), and the EU is able to redistribute the obligations among 15 countries (number of EU countries in that period) with the condition to act jointly and reach to the same target. The provision of Kyoto Protocol which regulates the condition wherein the Parties act within the framework of and together with a regional economic integration organization (mentioned

[18] http://pewclimate.org/projects/pol_review.htm

[19] The European Union was the "European Community" in those years, the "Community" was mentioned as "Union" in the report.

[20] Countries in Annex 1 List of UNFCCC are obliged to limited greenhouse gas emissions, protect and develop greenhouse gas swallow, and also to notify precautions and policies towards climate change and communicate their greenhouse gas emissions. This group includes countries which are OECD members as of 1991, EU countries and market economy transition countries. European Union is also in the Annex 2 list of UNFCCC (a total of 23 countries and EU). Annex 2 countries are responsible in addition to the obligations they have undertaken under the first group to transfer the environmentally adaptable technologies to partner countries in the way of development or to encourage, facilitate and finance access to these technologies.

under Kyoto Protocol, Article 4) responds to this situation.

In order to protect the emission discount of 8%, which is its common target in this direction, the European Union divided the obligations among the Member States according to the Legally Binding Burden-Sharing Agreement resolved in the Council in June 1998. A different emission mitigation target was identified for every Member State taking into account the conditions of Member States with various criteria such as economic size, other opportunities for emission discounts and per capita emission, and these targets demonstrate differences from country to country.[21] The reason that the Member States have different attitudes towards climate change is that the Member States have different levels of development or that they lack the capacity to meet the same targets due to problems that have national character.

These reasons recall that Member States handle the issue of struggling against climate change with an approach that puts the priority on national interests. As an up to date issue, it is worth underlining that with the exist of UK from the EU, EU will be losing an important Member State which is one of the strongest advocates of climate change.

With the completion of Kyoto Protocol ratification processes by Member States of the EU, EU has announced to the world that it has ratified the Protocol on 31 May 2002.[22] In the "European Union 1990-2000 Annual Greenhouse Gases Inventory and 2002 Inventory Report", which was published by European Environmental Agency in the same year, it was declared that the EU has fulfilled its target to mitigate the greenhouse gas emissions by 8% compared to 1990 year levels by the year 2000, which was its UNFCCC obligation, in a common way together with the Member States of that period (15 Member States).[23]

Even the economic crisis which has become the fundamental agenda issue of EU after 2008, did not distract EU from combatting climate change. In the EU2020 Strategy, which was adopted in 2010, which is one of the years when the impacts of the crisis were the most devastating, targets which contributed in struggling against climate change which were named as 20-20-20 were mentioned (European Union 20-20-20 Targets included increasing the greenhouse gas emissions by 20 percent as minimum, increasing the share of renewable energy in the energy consumption to minimum 20 percent, and increasing energy efficiency by 20 percent), and these targets were changed afterwards.

EU2020 aimed at enabling the member country economies to accomplish a smart, sustainable and comprehensive growth. In addition to the mitigation of greenhouse gas emissions, the strategy also emphasized on the dissemination of environmental friendly renewable energy sources and accomplishing more effective use of energy

[21] All policies and measures in the EU are developed at the level of Unions and Member States. Those which are created at the level of Union are named as common and coordinated policies and measures and applied for all Member Countries. Tools for fulfilling these common and coordinated policies and measures are directives, circulars, decisions, recommendations and opinions. Circulars are legally binding and are applied directly to all Member Countries. Directives are binding upon the Member States according to the results to be reached and are required to be transferred to their legal frameworks. For that reason there is a flexibility in terms of way and tools of enforcement. Decisions are literally legally binding for the countries defined.

[22] https://europa.eu/rapid/press-release_MEMO-04-43_en.htm? locale= en

[23] Türkeş, M. ve Kılıç, G. 2004. "Avrupa Birliği'nin Iklim Değişikliği Politikaları ve Önlemleri (European Union Policies and Measures on Climate Change)", Çevre, Bilim ve Teknoloji, Teknik Dergi, 2: 35-52.

resources by means of the developed new technologies.[24]

The second commitment period of Kyoto Protocol was determined as 2013-2020 with the Doha Amendment to the Kyoto Protocol which was adopted in the 18th session of the Conference of Parties in 2012 (COP 18, Doha/ Qatar). Doha Amendment includes new "Quantified Emission Limitation or Reduction Commitment (QELRC)" for the Annex1 parties of UNFCCC. With the amendment, an emission mitigation target of 18% compared to 1990 levels was put for all parties of Kyoto Protocol in the second commitment period.

In general, the emissions released by countries that have targets for the second commitment period constitute only 14-15% of the global emissions and the EU and 28 Member States and Iceland, Liechtenstein, Norway and Switzerland, which are EEA members, determined their QELRCs for the second commitment period and notified to the Convention Secretariat.

Following the Kyoto Protocol, Paris Agreement, which was adopted as one of the implementation mechanisms of UNFCCC and more importantly which constituted the framework of climate change regime after 2020, has entered into force on 4 November 2016. The European Union signed Paris Agreement on 22 April 2016 and ratified it on 5 October 2016.[25]

With Paris Agreement, the Parties have agreed on a long term target of ensuring that the global temperature increase shall not exceed 2°C compared to pre-Industrial Revolution levels (so as to limit not to be more than 1.5°C) In the preparatory process of the Agreement, the EU has set a target to mitigate emission by minimum 40% until year 2030 based on 2030 Climate and Energy Policies Framework[26] and the European Commission based on "Post-2020 Global Climate Change Combat Plan "[27] as per the Intended Nationally Determined Contributions (INDCs) presented to the UNFCC Secretariat in March 2015, and it has accelerated its practices in order to reach to this target. The 40% target of the EU in question which was determined based on global estimations, is compliant with the middle term target of Paris Agreement.

2.1. Climate Change in EU Founding Treaties

Following the signing of international climate change conventions/protocol, these agreements become a part of EU legal system and this situation is strengthening for directing the climate policies of the EU at global scale and also is facilitating.

European Union which has projected a need for a change in the path of economic, political and social integration in accordance with globalization and the requirements of 21st century, felt the need to engage in a new structuring in order to ensure sustainability of the current situation and on the other hand to cope with global challenges such as

[24] "Global Combat with Climate Change and European Union" Dr. Academician Seven Erdogan, Recep Tayyip Erdogan University, IIBF, International Relations Department, MANAS Social Researches Journal, 2018 Volume: 7, Issue: 4, 703-718 (This paper was presented verbally in the 8th International Conference of Strategic Research on Scientific Studies held in Vienna on 11-13 May 2018).

[25] https://unfccc.int/process/the-paris-agreement/status-of-ratification

[26] In October 2014, the European Council prepared the 2030 Framework for Climate and Energy for the target of mitigating greenhouse gas emissions by minimum 40% by 2030, in addition to the minimum 27% target in renewable energy and energy efficiency in the EU.

[27] European Commission, EU Action Against Climate Change, Leading Global Action to 2020 and Beyond, 2009, Brussels.

climate change, demographic transformations, energy safety and combatting terrorism in addition to expansion. Within the framework of searches for new solutions in this context, Lisbon Treaty was signed as a reform Treaty in December 2007. However, ratification of the Treaty by all Member States extended the process and the Treaty came into force on 1 December 2009. Important issues such as environment, combatting climate change, energy and terrorism, which have been in the agenda of this century, are among the fundamental issues in the Lisbon Treaty.

The Union has revised the Treaty of Lisbon and the Treaty Roma, which is the founding treaty of the former European Community. As a result of this, EU had a new European Union (Lisbon) Treaty which changed the European Union Treaty and the Treaty on Processing of European Union. With Lisbon Treaty, the EU has acquired a single international legal entity in the next ten years as of the year 2010 and the decision making process has accelerated, and its corporate structure has become more effective and its movement ability in foreign policy has increased. Also with Lisbon Treaty high level environmental protection and environmental quality increase principles have been brought for the EU and the environmental protection are being determined as one of the common authority areas between the Union and Member States. According to this, Council of Ministers of the European Union is required to consult both to the European Parliament and Union consultancy organs in its decision related to environment.

The environment and energy issues are generally handled together in the European Union. In both of these areas, there is a sharing of authorities between the Member States and the Union. This approach has become official with Lisbon Treaty and the European Commission has been granted the right to carry out climate change negotiations within the authorities and limits transferred in representation of the Member States

Thus, it has become under the authority of the EU Commission to develop measures at international level for combatting climate change and environmental problems overall the world and at regional level in the EU. Within this framework, European Union and Member States could develop cooperation in this field with international organizations and third countries in line with their authorities.[28]

2.2. Integration of Climate Change with EU Sector Policies

When the fundamental fields of implementation of EU environmental policy are analyzed it could be seen that waste management, protection of air quality, protection of water quality, chemicals, genetically modified organisms (GMOs), nuclear safety and protection from radiation, industrial pollution control and risk management, noise pollution management, protection of natural life and climate change issues are included and it is known that numerous regulations have been in force on these issues since past.

Today, the issues of environment and climate change in the EU are integrated into all relevant sectoral policies. There are numerous and detailed

[28] Nuran Talu, "European Union Environment Policy" Introduction to European Union, History, Institutions and Policies, Istanbul Bilgi University Publications, January 2009, Istanbul 183-200.

policies adopted and being carried out in energy, housing and service, transportation, industry, agriculture, forestry and waste management sectors and these are being implemented. For example, the basic policy actions in energy sector concentrate more on energy efficiency, renewable energy resources, energy-efficient production rules, improvement of energy services, combines heat and power systems.

In the Environmental Indicator Report, which was published by the European Environment Agency (EEA) in 2018, it was highlighted that there is a need for strengthening the environment and climate change policies in the European Union in order to reach 2020 targets. Within the context of realizing all required transformations in almost all sectors in combatting the climate change in Europe, European Environment Agency has been working on finance and financial systems needed in this field and it has been continuously updating its researches related to directing EU funds towards supporting a process of transition resilient against climate change.[29]

2.3. EU's Policies for Implementing Paris Agreement

Behind the success of EU in the global struggle carried out for combatting climate change is the need that it feels much towards adaptation to the economic interests and the impacts of climate change. For that reason, the meaning of Paris Agreement for EU is that it opens the door for important opportunities in the fields of employment and growth. Transition to a low carbon economy where the resources are efficiently used brings together engaging in fundamental changes in the fields of technology, energy, economy and finance in an integrated manner. It is considered that with the agreement, the process of transition to low carbon economies will contribute in the target of EU to be global leader in the field of energy and enliven the investments and innovations in the field of renewable energy.

The EU has declared four fundamental priorities in the process of preparation to Paris Agreement. These are:

I. Signing an internationally binding convention;
II. Adopting fair, ambitious and measurable greenhouse gas emissions mitigation targets;
III. Regularly following the performance of reaching the targets identified under the scope of the convention; and
IV. Identification of the common rules which will be applicable for all in order to ensure transparency and accountability.[30]

When the commitments of Paris Agreement are considered, it could be seen that EU has been mostly successful in implementing these priorities.

Following the ratification by EU of Paris Agreement, it has launched the works for determining which type of improvements should be made in the policies and regulations in order to fulfill the obligations under the agreement without losing time. The roadmap that was revealed as a result of these studies was

[29] Hans Bruyninckx, EEA Executive Director, Main Article published in EEA bulletin No. 04/2016, December 2016 (https://www.eea.europa.eu/tr/articles/iklim-finans-dusuk-karbonlu-iklim).

[30] "Global Combat With Climate Change and European Union" Dr. Academician Seven Erdogan, Recep Tayyip Erdogan University, IIBF, International Relations Department, MANAS Social Researches Journal, 2018 Volume: 7, Issue : 4, 703-718.

shared with public on 2 March 2016. According to this roadmap, EU is committed to immediately start to update the fundamental regulations such as Emissions Trade System (ETS) in the year 2016 and implement the commitments it has provided for Paris Agreement in addition to signing the agreement. Following Paris Agreement, all EU Member States are required to convert the responsibilities they have undertaken into concrete policy actions after 2030 Energy and Climate Policies Framework Paris Conference. Paris Agreement is supportive of the approach of EU. Implementation of the energy and climate policies framework towards 2030 by the European Council has a priority in following up the Paris Agreement. European Commission has acted to renew EU Emissions Trade System (ETS) which covers 45% of the greenhouse gas emissions. Besides, it has presented important draft bills in order to implement the regulatory framework for 2030 in a fair attitude with suitable costs by ensuring maximum flexibility to Member States within one year.

At the next stage, recommendations have been prepared on Effort-Sharing Decision and Land Use, Land Use Change and Forestry (LULUCF). Besides, it is known that a separate regulation is in the agenda in order to create a reliable and transparent governance mechanism and regulate the planning and reporting obligations related to climate and energy in the post-2020 period.

In relation to global climate financing policies, EU and Member States have adopted the decision to increasingly contribute to the target of providing 100 billion USD until the year 2020 as committed by the developed countries within the public, private, bilateral and multi-lateral mechanisms, including alternative finance resources. Within the scope of 2014 – 2020 Multiannual Financial Framework, EU has decided to use 20% of its total budget for projects and policies related to climate. This rate corresponds to 14 billion EU when considered from the point of climate financing for the developing countries within the context of foreign expenditure and financial aids. Supports to post-2020 climate plans for the developing countries will be further strengthened with the support programs such as Global Climate Change Alliance.[31]

2.4. White Paper on the Future of Europe[32] and Climate Change

In the White Paper on the Future of Europe[33] it is highly emphasized that the leading role the EU in the implementation of Paris Agreement and United Nations 2030 Sustainable Development Goals (SDGs) in struggling against global climate change.[34] The Paper indicates *that EU27*[35]*has been managing the shaping of global agenda in the positive direction in many fields such as financial stability and sustainable development.*[36]

In the White Paper, it is promised to decarbonize the economy of Europe in an ambitious manner and to mitigate the hazardous emissions and it is stated that the Europe should continue to adapt the increasing impacts of climate change.

[31] This paragraph is quoted from the brochure titled "On the Future: Paris Agreement" prepared by European Union Turkey Delegation.

[32] White Paper: It is a document prepared by the European Commission which includes concrete recommendations in the issue handled by reflecting the opinions of shareholders in the design of final policy

In the White Paper on the Future of Europe[33] it is highly emphasized that the leading role the EU in the implementation of Paris Agreement and United Nations 2030 Sustainable Development Goals (SDGs) in struggling against global climate change.[34] The Paper indicates *that EU27[35]has been managing the shaping of global agenda in the positive direction in many fields such as financial stability and sustainable development.*[36]

> *"Europe hosts the biggest single market of the world and the second most used currency of the world. It is the biggest trade power, development and humanitarian aid donor. By means of Horizon 2020, which is the partially biggest multi-national research program of the world, Europe is among the leaders of innovation. EU Diplomacy has a real weight and helps the world to develop in a sustainable way. This situation is demonstrated with the historical nuclear program agreement with Iran, the role played by the EU in* ***Paris Climate Agreement*** *and the adoption of 2030 Sustainable Development Targets by United Nations. This impact is reinforced with close collaboration with NATO and the active role of the European Council"*
>
> *White Paper on the Future of Europe, Considerations and Scenarios for EU27 by 2025,*
> *2. Directors of the Future of Europe, a Changing Role in a Changing World*
>
> **European Commission**
> **COM (2017) 2025, 1 March 2017.**

In the White Paper, it is promised to decarbonize the economy of Europe in an ambitious manner and to mitigate the hazardous emissions and it is stated that the Europe should continue to adapt the increasing impacts of climate change.

While underlining the fact that EU companies hold 40% of the total patents in the world in the field of renewable energy Technologies, the book states that one of the important challenges to be encountered in struggling against climate change is to provide innovative market solutions both inside and outside the EU.[37] The Paper also emphasizes that, taking into account the negative impacts of climate change, population flow will take place from different parts of the world and pressures that cause the migrations will increase, and this situation will lead to population increase in Europe as well as tensions that spread through wide geographies.[38]

framework towards the Union actions on a specific issue. In some cases White Paper is a continuity of the Green Paper and translates the results concluded in the Green Paper into recommendations.

[33] "White Book on the Future of Europe/ Reflections and Scenarios for EU27 by 20250", European Commission COM (2017), 2025, 1 March 2017, Brussels (https://ec.europa.eu/commission/sites/beta-political/files/white_paper_on_the_future_of_europe_en.pdf).

[34] "White Paper on the Future of Europe, Reflections and Scenarios for the EU27 by 2025", 2. The Drivers of Europe's Future, A Changing Place in an Evolving World, European Commission COM (2017) 2025, 1 Mart 2017.

[35] As the United Kingdom will leave the Union (Brexit Agreement), the number of EU member states decreased to 27.

[36] White Book on the Future of Europe, Reflections and Scenarios for EU27 by 2025, 3. Five Scenarios for Europe by 2025: "Scenario 1: To Continue" – European Union focusing on Ensuring Positive Reform Agenda COM 2017 2025 1 March 2017.

[37] White Book on the Future of Europe, Reflections and Scenarios for EU27 by 2025, Directors of the Future of Second Europe, A Significantly Transformed Economy and Society, European Commission COM (2017) 2025, 1 March 2017

[38] White Book on the Future of Europe, Reflections and Scenarios for EU27 by 2025, Directors of the Future of Second Europe, Increasing Treats and Concerns on Security and Borders, European Commission COM (2017) 2025, 1 March 2017

3. CLIMATE CHANGE IN EU ENVIRONMENT ACTION PROGRAMS

Environment Action Programs of the European Union are the documents which are adopted as the official statement of the Council without any legally binding character. EU Environment Action Programs, which have been implemented for around fifty years in certain time slices (1973 and afterwards) are being continued using various mechanisms such as financial (LIFE Program, structural funds etc.) and technical (Eco Labelling, Eco- Management and Audit System/ EMAS) in line with the environmental laws in the acquis communaitaire and policies developed. A brief history of EU Environment Action Programs is given below, of which the Seventh (2013 – 2023) has been implemented as of today:

EU First Environment Action Program has been implemented between 1973-1977. The principles highlighted in this Action Program were the principles of who pollutes pays, preventing the pollution at source and taking into account the environment in planning/decision making processes. Besides, some elements for encouraging international cooperation in the implementation of European environmental policy in the first program were also included.

The EU Second Environment Action Program that involves years 1977 – 1981 is complementary to the first action plan and issues that were emphasized more in the Program were pollution prevention and protection policies in various areas, connection between environment and employment policies and financing burden brought by environmental policies. In the second program, environmental policies were defined as a fact that are proposed to prevent the economic growth investments due to bringing additional financial expenditures and restrictions in the practice. Besides, the role of civil society organizations was also handled in this program.

It is after the Second Action Program that the European Union adopted the policies that anticipate and prevent would be more effective rather than reach and cure. Within this framework, a comprehensive protection strategy was adopted for the protection of natural resources in EU Third Environment Action Program that covers 1982-1986 period, and this situation was reflected to the practices. In the Third Program, it was emphasized that in an economic activity that is carried out in any of the agriculture, energy, industry, transportation and tourism sectors, taking into account the environmental dimension will be more beneficial in terms of a healthy economic growth at the planning stage, and it was accepted that the struggle against pollution and damaging of scarce resources would be carried out in a cheaper and efficient manner. Together with the Third Environment Action Program, the "corrective" policies were replaced with "preventive" policies in Europe. All elements such as protection of human health, water, climate, raw materials, air, soil, flora, fauna, artificial environment, cultural heritage, which have direct effect in determining the life quality in the program, as well as the improvement and protection of the sources are among the basic issues. The Program was also a program that emphasized the harmonization of EU environment policy with other Union policies. In the Third Program, a more concrete connection was established between employment and environmental policies and it was foreseen that environmental activities will be more effective in the fields of developing innovation/ technologies in industry and creating employment.

EU Fourth Environment Action Plan (1987-1992) has handled the issue of environment protection with a wider perspective as a component of economic and social development. It could be seen that the program includes very tight environmental standards which were not seen in the previous programs. Meanwhile the Maastricht Treaty has been realized within the Fourth Program period and the environmental principles and policies of the Union were significantly enriched with the obligation of the Treaty, and important changes were made in the founding treaty in this direction.

When considered from the point of sectoral integration, more emphasis was put in the Fourth Program on the energy sector and environmental interaction and the condition to establish a balance between energy use and environmental protection purposes was adopted. Since the energy production is mostly obtained from fossil fuels, pollution in the atmosphere is inevitable. Precautions taken for prevention of environmental pollution increase energy costs and affect the competition prices of different energy resources. Measures taken in relation to energy saving and all measures taken for dissemination of use of alternative energy resources other than fossil fuels and smart use of the resources have positive contributions on mitigating the atmosphere pollution. Although climate change policies are not directly mentioned in the Fourth Program, these approaches adopted in relation to the energy sector involve issues related to climate change. From this perspective, it will not be erroneous to evaluate that climate change policies have started to developed together with EU Fourth Environment Action Program period.

The targets of Maastricht Treaty have been directly reflected to EU Fifth Environment Action Program with the title of "Towards Sustainability". Fifth Environment Action Program, which covers the years 1993-2000, has drawn a more effective framework due to its transnational character in the determination and implementation of common policies of the Union and with this Program, policies have been determined in order to ensure that some sectors are in harmony with the environment in order to put into life the sustainable development tool of EU. In this direction, importance was given in the Program on agriculture, transportation, energy, industry and tourism sectors in the implementation of policies that are compliant with the environment, and it was emphasized that the environmental policy should be integrated with the policies of this sector. The targets of the Fifth Program have been fully in compliance with the basic decisions of 1992 United Nations Conference on Environment and Development (UNCED) Rio de Janerio, Brazil (UNFCCC was opened for signature in this conference). The issues of importance in the fifth program were air pollution, acid rains, protection of water resources and natural resources, biodiversity and climate change. The Program involves approaches for not victimizing the private sector in terms of competition due to the financial burdens to be brought by protection of environment. The Program also aimed at realizing the environment and sustainable development policies and practices in accordance with the principles of participation and transparency in line with the decisions of UN Environment and Development Conference. It was emphasized in the program that all social actors have important roles in the activities for integrating environment to other sectors.

In the Sixth Environment Action Program, which is titled "Our Future, Our Choice" and which initially covered the period 2002-2010[39] the sustainable development approach was adopted as the fundamental objective of the Union in line with EU Goteborg 2001 sustainable development strategy in the beginning and with the requirements of the renewed Strategy. In the Sixth Program, the strategic approaches created to enable the Union to reach environmental targets are listed below:

- Environment policy should demonstrate an innovative approach and new ways should be searched to be in collaboration with a wide section of the society.
- Implementation of the existing environmental laws should be developed.
- The issue of harmonization of environment policy with other policies should be deepened.
- More sustainable production methods and consumption habits should be developed.
- More qualified and easily accessible information should be provided on environment in order to shape (label) the thoughts and behaviors of citizens on environment.
- Decisions on the land use and management in the Member States should protect and develop the environment.

The Sixth Program directed towards four priority areas taking these approaches into account and it was foreseen to take tighter precautions in these areas. These are:

1. Climate change,
2. Natural and biological diversity,
3. Environment and health, and
4. Sustainable use of natural resources and waste management.

In the climate change priority area, the European Commission has set a target within the framework of mitigating the global emissions of greenhouse gases at 20-40 % by the year 2020, in addition to the target of mitigating the greenhouse gas emissions by 8% between 2008 -2012.

Accordingly, it is foreseen that structural changes will be realized in the energy and transportation sectors of the EU. The Sixth Environment Action Program targeted in the combat with climate change increasing the works for effective use of energy, use of renewable energy sources and the technological researches in this direction, establishing a Union system for the trade of emission rights and raising awareness among people in this area. In the Sixth Program, the following actions were defined in relation to climate change.[40]

1. Creating a plan in the EU in relation to the trade of CO_2 emissions;
2. Performing inventory and review studies for the state aids in relation to energy sector in the Member States taking into account the adaptation activities towards the prevention of climate change;
3. Supporting renewable energy sources by means of the new Directive adopted and providing sufficient support in this direction in the liberalized energy market;
4. Using market tools by means of adoption of energy taxation recommendations;

[39] The end of EU Sixth Environment Action Program was set as year 2012 and was extended officially up to this date.

[40] Türkeş, M. ve Kılıç, G. 2004. Avrupa Birliği'nin iklim değişikliği politikaları ve önlemleri (European Union Policies and Measures on Climate Change). Çevre, Bilim ve Teknoloji, Teknik Dergi, 2: 35-52.

5. Increasing energy saving in the heating and cooling of buildings;
6. Framework agreements with the industrial sector for mitigation of energy efficiency and some emissions.
7. In case of failure to reach an agreement on actions towards mitigation of greenhouse gas emissions arising from aviation in the International Civil Aviation Organization by the year 2002, defining special actions in this direction.
8. Accepting that climate change is one of the most important issues of the Union for research and technologic development and in collaboration with the researches in Member States.

Following the Sixth Environment Action Program, which ended in 2012, the Seventh Environment Action Program titled "Living Better At the Borders of the Planet" which came into force on 17 January 2014 covers years 2013-2023, and the general objectives of the Program are listed below:[41]

- Protecting, preserving and developing the capital in the European Union;
- Converting European Union to environmentalist and competitive low carbon economy that efficiently uses resources
- Protecting the citizens of European Union against environmental pressures and health and wealth risks;
- Better implementation of the regulations;
- Developing the information base and providing better information;
- Realizing wider and more logical investments for environment and climate policy
- Ensuring full integration of environmental requirements to other policies;
- Converting the union countries into more sustainable ones;
- Supporting the international climate environmental problems of the Union in a more efficient manner.

The fundamental policy of the EU in relation to combatting climate change is emphasized with the following statement: *"We should consider global warming as an opportunity to green our economies, animate growth an accelerate investment in new technologies. "*

In this direction, EU's climate change strategy has focused on two fundamental policy areas in the Program period, including Europe with Strong Ecologic Resistance (a Natural Resource Effective Europe) and Low Carbon Economy.

[41]https://ec.europa.eu/environment/action-programme/objectives.htm

4. LEADING POSITION OF EUROPEAN UNION IN GLOBAL CLIMATE POLICIES

Whereas combatting climate change has started as a global struggle carried out under the roof of United Nations in the period following 90s in the past century, the European Union has been one of the leading institutions of the efforts in this field.

Europe is one of the geographies which will suffer the most from the impacts of climate change on the earth. The main factor that ensures that EU is one of the desirous actors in combat demonstrated against climate change is that the level of concern among EU member country citizens related to climate crisis has been increasing and has reached to the highest point up to now. According to the Eurobarometer survey study which was conducted in order to reveal the opinions of member and candidate member countries of the EU, climate change has arisen as a second source of concern after refugee problem. 22% of the European citizens consider climate crisis as the most important subject and threat in the agenda of Europe.[42]

Whereas the rate of people who respond to the question "what are the two important problems that the European Union faces" was 5% in the year 2014, this rate increased to 22% level in 2019. According to November 2018 data of Eurobarometer, 93% of Europeans believe that human activities caused climate change and 85% believe the combatting climate change and using energy more efficiently will crease economic growth and employment in Europe.[43] When considered at the level of countries, Denmark is the country where the people were most concerned about climate change with a rate of 49%, which was followed by Sweden with 48% and Finland with 40%. This rate increased to 31% in Germany.[44]

EU, which has undeniable contribution in global greenhouse gas emissions (third after China and the USA), is one of the most desirous actors in contributing in the global struggle carried out within the scope of climate change as it was indicated before. This desire continues to be echoed at the global public have roles in the combat with climate change (international organizations, states etc.).

The leading role of European Union in the global climate policies has started with its breakthroughs in the process that accompanied Kyoto Protocol. EU has demonstrated great efforts in the years in question in order to enforce Kyoto Protocol and has announced its leadership in the global climate struggle by accomplishing this.

EU has undertaken a leading role in the formation of innovative economy policies and tools towards ensuring adaptation to the Kyoto Protocol. Upon it being understood that it was not possible to reach to the

Average carbon footprint of a European is around 7 tons CO_2 annually.

[42] https://yesilekonomi.com/ab-ulkelerinde-iklim-endisesi-yukseliyor/?utm_source=newsletter&utm_medium=email&utm_campaign=osb_lerde_yenilenebilir_yatirimlari_sinirlandirildi_guenluek_buelten&utm_term=2019-08-06

[43] https://www.gesis.org/eurobarometer-data-service/survey-series/standard-special-eb/study-overview/eurobarometer-902-za7488-october-november-2018

[44] In the survey study conducted by TNS Piar Company in Turkey under the instruction of European Union within the framework of the up to date research in question, the rate of those who responded the same question as the Environment, Climate and Energy issues was 3%.

emission mitigation target set for the EU in Kyoto Protocol with the current policies and measures, EU has created the First European Climate Change Program (ECCP I) (2000 – 2004) in 2000 for the purposes of developing additional cost-effective policies and measures.[45]

Besides, in the period in question it was targeted to create an Emission Trade Plan which was planned to be made operational in year 2005. ECCP I has operated towards the purpose of generating more advanced programs that strengthen each other in mutual and consistent harmony by establishing connection with the existing initiatives in the sectors and areas that contribute in climate change such as energy, transportation and air quality. "Second European Climate Change Program/ECCP II" was published in 2005 and the Program has focused on more appropriate cost options for mitigating greenhouse gas emissions in the EU[46], increase economic growth and crease jobs in synergies with 2000 Lisbon Strategy[47]. Thus the EU Emissions Trade System (ETS) was established. Although it was being implemented in some states of the United States of America (USA) beforehand, EU ETS is the widest and the first emission trade mechanism in the world in this sense. EU ETS focuses more on big formations that operate in the sectors such as industry, energy and aviation.

Upon failure to reach a global agreement for protecting against the devastating impacts of climate change in the 15th Conference of the Parties (COP15, 2009) that was held in Copenhagen, which was organized with great expectations for solution due to the insufficiency of quantified commitments of Member States/ other states within the framework of the Kyoto Protocol, the European Union put higher importance to combatting climate change and directed a series of developed and developing countries towards the structuring of Paris Agreement, which was the new climate agreement, within the context of international climate negotiations and established the building stones of Paris Agreement, and thus strengthened its leadership position in global climate policies.

The call for a Long Term Strategic Vision for a Climate Neutral Europe by 2050, which was published by EU Commission on 28 November 2018, was shared with EU Foreign Ministers in February 2019.[48] Following this, the Foreign Ministers renewed their commitment towards the climate action leadership that is accelerated in all fronts of EU by calling for an urgent and committed action with the Council Conclusions on Climate Diplomacy which they published on that date through EU council for the global public in order to increase and strengthen the global measures in struggling against climate change[49].

It is considered that this step of EU, which is one of the diplomatic actions in the path of exciting/ claiming global efforts in combatting climate change, multipartism and implementing Paris Agreement, is important for mobilizing the political wills of states towards Climate- Neutral economies.

[45] https://ec.europa.eu/clima/policies/eccp/first_en
[46] https://ec.europa.eu/clima/policies/eccp/second_en
[47] Lisbon Strategy is a development plan which determines the general perspective of the European Union for the restructuring of EU economy in the European summit held in Lisbon under the chairmanship of Portugal on 23 – 24 March 2000.
[48] https://europa.eu/rapid/press-release_IP-18-6543_en.htm
[49] EU Council Decision dated 18 February 2019 (https://www.consilium.europa.eu/media/38215/st06153-en19.pdf).

Also with another important Declaration published by the Council of European Union in May 2019 (9 May 2019, Sibiu, Romania), 10 priorities were determined by EU leaders for acting in union and solidarity in the world which has become more complex and has been rapidly changing[50] and they once again declared their commitment within this framework. One of these priorities relates to combatting climate change. With this opportunity, EU has adopted the decision to carry out actions towards completing "A Resilient Energy Union with Forward Looking Climate Change Policy"[51]. This decision is the extension of the "Long Term Vision of a Climate Neutral Europe As of 2050".

Another important issue that contributes in the leadership of Europe on climate change at global level is that the practices of the Member States are being inspected by EU institutions. The European Commission, which follows up the practices in the Member States in the EU system according to the declarations that come from Member States, does not ignore the effect of Court of Justice of the European Union which has the authority to take decisions against Member States that do not fulfill their obligations.[52] An up to date example of this situation could include the decision taken by the EU Commission to refer Greece to EU Court of Justice with the justification that it failed to sufficiently protect biodiversity. This decision of the EU Commission was taken with the justification that, despite the period assigned for Greece having expired, this country could not determine/put targets required for Natura 2000 fields and take protection measures and that this situation endangers the network integrity overall EU.[53]

[50] 10 Priorities: 1-Job Opportunities, growth and investment, 2- Digital Single Market, 3- Energy Union and Climate, 4- Domestic Market , 5- Deeper and more detailed, fairer economic and monetary union, 6- A balanced and progressive trade policy to ensure globalization, 7- Justice and fundamenal rights, 8-Migration, 9-Stronger global actor and 10-Demographic change (https://ec.europa.eu/commission/priorities_en)

[51] Priority 3: Energy Union and Climate/Energy union and climate/Making energy more secure, affordable and sustainable (A Resilient Energy Union with a Forward-Looking Climate Change Policy).

[52] "Global Combat with Climate Change and European Union" Dr. Academician Seven Erdogan, Recep Tayyip Erdogan University, IIBF, International Relations Department, MANAS Social Researches Journal, 2018 Volume: 7, Issue: 4, 703-718. (This paper was presented verbally in the 8th International Conference of Strategic Research on Scientific Studies held in Vienna on 11-13 May 2018).

[53] https://www.gidahatti.com/yunanistan-ab-adalet-divanina-sevk-edildi-gerekce-ne-154044/

5. EU SUSTAINABLE DEVELOPMENT STRATEGY AND CLIMATE CHANGE

The sustainable development approach of the EU has set the protection of environment as a fundamental element that has to be taken into account in sectoral terms (agriculture, industry, transportation, energy, tourism etc.) in all decisions and policies related to economy. Here it is a principle that environmental protection policies should be developed keeping in mind the competitive understanding of the economic system. Elements which will require a market economy with high competitive power of the sustainability of the development of Europe have been determined taking into account the environmental policies and there are a series of principle decisions in this direction.

Sustainable development policy has first become clear in 1993 in the EU with Maastricht Treaty [54] and was included in all primary legal documents of the EU after that date. This approach was included in Amsterdam Treaty afterwards in 1997 as a comprehensive objective of EU policies. With Amsterdam Treaty which entered into force in 1999[55] it was adopted to ensure the conditions of sustainable development in the EU and the concept of sustainable development was included in the objectives of incorporation (Article B) and main targets (Article 2) of the EU. Another important change that came together with the Founding Treaty is the responsibility to integrate measures which are required to be taken for protecting the environment and ensuring sustainable development with the definitions and applications of all Union policies within the framework of a new article added (Article 3c).

One of the important turning points of European Union from the point of sustainable development policies at the level of Council was the Cardiff process. Cardiff process (1998-2001)[56] is a time period comprising a series of meetings which lasted until year 2002 and brought together significant decisions. In this period, it could be seen that the decision of integrating environmental policies with other policy areas has become stronger and in particular the environmental integration in the energy, transportation and agricultural sectors was highlighted. Cardiff process focused the European Strategy for Sustainable Development, Priority Integration Areas on these three sectors. In this process, it was aimed at having the environmental policies that are dynamic, knowledge based, competitive and with quality employment and decisions were taken which made the industrialist to be more sensitive on this issue.

Following a series of Council meetings and decisions which handled concrete targets and measures for the EU to progress on the sustainable development path, A European Union Strategy for Sustainable Development, which was adopted in May 2001, defined concrete actions in climate change in the field of environment, protection of biodiversity, interaction of environment and health policies and hazardous chemicals. Following this, the European Commission proposal titled "Sustainable Europe for a Better World: European Union Strategy for Sustainable

[54] With the Maastricth Treaty which was signed on 7 February 1991 and entered into force in November 1993, European Economic Community was named as European Union.

[55] Amsterdam Treaty was signed by EU member countries in 2 October 1997 and fundamental changes were made in the conditions of Maastricht Treaty which was signed in 1992. The Treaty came into force on1 May 1999.

[56] This process started with a meeting in Cardiff that was held on 15-16 June 1998. (Cardiff process Council meetings: Wienne-December 1998, Cologne-June 1999, Nice-December 2000, Lisbon, March 2000, Stockholm, March 2001 and Göteborg Summit, June 2001).

Development in Europe" was approved by the Council in Goteborg in 2001.

This date is also the year in which combatting climate change was officially recognized in Europe as a priority of EU's development strategy. In Goteborg, policy measures and targets were recommended which aimed at finding solutions to various important tendencies which are not possible to be maintained in EU Sustainable Development Strategy. Priorities in this direction were determined as combatting climate change, ensuring sustainable transportation, pollution caused by chemicals, abolishing threats towards public health such as unsafe food, contagious diseases, managing natural resources in a more responsible way and stopping the trend of decrease in biodiversity, combatting poverty and social discrimination and finding solutions towards the problems related with the ageing of the population.[57]

Goteborg Summit (The First Transatlantic Summit between EU leaders and US President George W. Bush) has a separate importance from the point of environmental policies. EU has handled the discussion on sustainability with expansions so as to provide for social and economic opportunities at the highest policy level. At the core of Goteborg decisions which were merged with Lisbon decisions of the EU are the cooperation of sustainable development policies at the level of Member States and taking into account the obligations of these policies at international level (UN Rio 1992, Rio 2012 and Rio+20) and at the level of Union. In this direction, EU has foreseen that sustainable development is a strategy that brings together the renewal of economic and social policies, and will crease important economic opportunities that will mobilize new technological innovations and investments (investments in environmentally friendly technologies). In summary, "European Union Sustainable Development Strategy" has highlighted the policies in the fields of "energy and sustainable development", "protection of water resources", "earth use and protection of biodiversity" for the sustainable management of natural resources.

In the EU Sixth Environment Action Program which was implemented between 2002-2012 the sustainable development approach was adopted as the fundamental objective of the Union in line with EU Goteborg 2001 sustainable development strategy in the beginning and with the requirements of the renewed Strategy. Among the thematic research issues included in the program, the targets that were determined under the title of "Sustainable Development, Global Change and Ecosystems" were designed so as to enable implementation of sustainable development at short and long terms. Over time, due to important reasons such as the increase in the number of EU members, stability that arises from terrorist threats and violence, globalization problems (climate change, food safety etc.) and changes in EU and global economy, it was concluded that the works conducted for putting Europe to a sustainable route should be intensified. This situation leads to the need to create a new sustainable development strategy which envisages focusing stronger within the Union, sharing of responsibilities in a clearer way, wider ownership and more intense support, more integration with international organization and more effective implementation and monitoring mechanisms.

[57] Nuran Talu, "European Union Environment Policy" Introduction to European Union, History, Institutions and Policies, Istanbul Bilgi University Publications, January 2019, Istanbul 183-200.

Within this framework, a "EU Sustainable Development Strategy" that was renewed in an ambitious and comprehensive manner was adopted in by the European Union Council in June 2006.[58] The new strategy which was prepared as a result of an intense review process that was launched in 2004 relies on the principles of Goteborg 2001 Strategy. The general purpose of the renewed strategy is to manage and use the resources effectively, benefit from the ecologic and social innovation potential of the economy, ensure protection of wealth and environment and social cohesion. By means of creating sustainable societies, continuously improving the life quality for the existing and future generations is naturally among the purposes of the strategy.

The new EU Sustainable Development Strategy acknowledges that there is a need to adopt a more integrated approach for gradually changing the existing modes of consumption and production which are impossible to be maintained, and for adopting relevant policies. The document reconfirms the requirement for global solidarity and acknowledges the importance of intensification of efforts with non-EU partners, including the countries which have important impacts on global sustainable development and which are rapidly developing. The strategy demonstrates the general purposes, targets and concrete studies in 7 priority issues that are directly related to the environment in the future of EU. The priority issues in question are listed below:"

1. Climate change and clean energy
2. Sustainable transportation
3. Sustainable production and consumption
4. Threats towards public health
5. Better management of natural resources
6. Social participation, population and migration
7. Combatting global poverty.

Priority titled climate change and clean energy is emphasized as one of the important part of the environmental and socio-economic future of EU. Based on the importance of the need to establish a gradually increasing connection between climate change policies and development economy, this situation which recalls evolution in the positive meaning in energy policies will become the field of attraction for all relevant sections in the fields of production at the scale of need, efficient energy consumption, more use of renewable energy resources, and smart use of ecosystem services. In such a period when the point of view towards problems has started to change/ evolve together with Paris Agreement, EU continues to combat the problems of climate change with all of its Member States on one hand, and, on the other hand, it increases its policies and actions gradually in order to reach sustainable development targets which it has determined taking into account the new paradigm shifts (circular, green, low carbon, carbon-neutral economies).

Within this framework, the EU progresses towards transformation to a low-carbon, climate-neutral, resource-efficient economy with biodiversity, fully in compliance with the whole UN 2030 17 SDGs and in particular the goal 13, "Climate Action"[59] . The necessity to need equality and social integrity for each citizen in this transformation (without excluding any citizen) has been reflected to EU decisions. The economic growth of the EU is possible by being less dependent on renewable resources and the

[58] It was adopted in European Council Meeting of Heads of States and Governments (15-16 June 2006).

[59] United Nations General Council" Transforming Our World: 2030 Sustainable Development Goals/SDGs Res A/RES/70/1, 2015, New York.

sustainable management of renewable resources and ecosystem services constitutes the principle of the Union policies.

The Preface of Paris Agreement has reference to SDG 13 (Climate Action) and the importance of implementing the policies and practices defined in line with sustainable development priorities of Parties was emphasized for the success of combatting climate change.

EU has continued to develop sustainable development strategy at certain intervals taking into account the factors that affect the future of Europe and the world. For example, in the "White Paper on the Future of Europe" published in March 2017, it is emphasized that EU shapes the global agenda in the field of sustainable development in positive direction and thus plays a leading role in the development of UN SDGs. EU continues to integrate the sustainable development strategy to the building stones of policy areas (Business Opportunity, Growth, Justice and Democratic Change) for a more integrated, more democratic and stronger Europe[60].

In almost all policy elements included in the "Long Term Vision for a Climate-Neutral Europe by 2050", which was adopted in November 2018 by the European Commission, the importance of integration of EU's climate change combatting and sustainable development strategies is emphasized.
As a more up to date information, EU Commission has published a report titled Reflection Paper "Towards a Sustainable Europe by 2030" in line with the White Paper for the Future of Europe" in February 2019.[61] With this document which evaluates the scope of challenges for Europe in relation to sustainability and presents explanatory scenarios for future, it is aimed at directing the discussion on how the targets put by Europe could be reached in the best way. The Report has determined 3 scenarios as main lines in reaching the sustainable development targets in Europe.

- Implementing a comprehensive EU-SDGs Strategy that will guide all actions of EU and Member States;
- The Commission continuing the integration of SDGs to all relevant EU policies without challenging the targets and actions of Member States, and
- Reinforcing the existing sustainability efforts/ claims at EU level on one hand, putting more focus on non-EU actions on the other.

In the "Sustainable Europe, 2030" report, assessments that strengthen the theory of "circular economy" was included which reflect the necessity of transformation in economy policies in struggling against climate change in the EU and it was emphasized that circular economy has the potential to be focus in mitigating greenhouse gas emissions. The report in question, emphasized the importance of directing the EU economy to a more circular path with the support of "EU Circular Economy Action Plan" and "Bio-economy Strategy" by EU Commission in transition from linear economy[62] to circular economy[63] in EU in order to create opportunity for the rediscovery of sustainable economic growth.

[60] https://ec.europa.eu/commission/sites/beta-political/files/juncker-political-guidelines-speech_en.pdf
[61] Reflection Paper "Towards a Sustainable Europe by 2030" European Commission, 2019, Brussels (https://ec.europa.eu/commission/publications/reflection-paper-towards-sustainable-europe-2030_en).

[62] The linear economy, which could be defined as a disposable economy in one sense, is the economy model that we have been living in for the years.
[63] Circular economy is an industrial term which expresses transformation and retransformation instead of production, utilization and destruction in industrial economy. In circular economy, the producers design reusable products, the purpose here is to reuse the material.

6. LONG TERM VISION FOR A CLIMATE-NEUTRAL EUROPE BY 2050

At the current point in combatting the climate change, UN member states and the European Union have acknowledged that there is a need to make fundamental changes in a series of sector areas such as energy, technology, economy and finance etc. with an integrated approach in addition to transition to a low-carbon economy where resources are efficiently used, which is the fundamental objective of Paris Agreement. The meaning of this expectation from the point of EU is that combatting the climate change in Europe will open the door to important opportunities particularly in the fields of employment and growth. When the historical background of global struggle against climate change is considered, it is known that EU has been demonstrating an attitude that directs the global policies and acting actively in the process with all of its decision organs since the beginning. As a matter of fact, transition of low carbon economies is considered as an important tool for the Union for walking towards the target of becoming a global leader in the field of renewable energy.

Numerous strategies, decisions and regulations have been formulated in a long process in relation to needs and breakthroughs in combatting climate change. Within the framework of "EU Long Term Vision for a Climate-Neutral Europe by 2050[64]", which was recently adopted in November 2018, the Union is continuing on its path rapidly.

This vision defined policies towards the process of transition to 'zero carbon future' in almost every sector (energy, housing and services, transportation, industry, agriculture, forestry, waste management etc.) in addition to a European policy that resilient against climate change with low carbon. Naturally the vision is directed towards the implementation of Paris Agreement. Paris Agreement demonstrates the target of keeping global heating below 2°C and if possible at 1.5°C for the Parties, and points out establishing a balance between anthropogenic emissions and annihilating greenhouse gases with sinks. The Agreement has also invited all Parties to transmit to UNFCCC their strategies to mitigate greenhouse gas emissions with long term visions that target the middle of the century by the year 2020. While drawing their 2030 and/or 2050 vision, the Parties are required to determine the industrial competition results of innovations and technology required for reaching climate targets and particular targets based on energy sector in particular, as well as the impacts that could be for employment and economic growth. This also means fulfilling the requirements of the circular economy. The European Union includes a series of technologies, new sectors and new practices, including transformation in energy sector within this framework, and this will also bring together the opportunities from the point of growth of Europe and improving the employment conditions.

[64] The roadmap which was determined in many sectors and areas within the framework of "Long Term Vision for a Climate-Neutral Europe in EU by 2050" was adopted by European Commission with a decision taken on 28 November 2018 (A Clean Planet for all A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy) and was shared with the public. The content of the text in question was translated into Turkish and attached to this report.

6.1. EU 2050 Climate-Neutral Vision and Global Leadership

The Climate-Neutral Vision drawn by the EU as of 2050 could be guiding not only for EU countries but for the climate policies of many countries in terms of being a mediatory towards development of many research and innovation programs and new market designs. From this perspective, with 2050 Climate-Neutral Vision, EU has launched a new modernization and transformation in economy polices for the implementation of an economic model that will not damage the climate of the planet. The claim here is that EU will be the biggest economy of the world which is planned to become Climate-Neutral until the year 2050, and it is apparent that this has the purpose of reinforcing the leading position of EU in combatting climate change at the global level.

EU, which aims at becoming a powerful regional institution that progresses towards technologic leadership in struggling against climate change, continuously underlines that it has a special position in terms of implementing consistent policies in its own internal market of 500 million people and also cope with a giant global threat such as climate, if it manages to act in collaboration with the actors in this field – global trade blocks etc.- for the sake of acting in accordance with the spirit of Paris Agreement. As a matter of fact, there is a need for a joint vision, joint resource management and joint financing at global level in resolving the climate crisis and also there is a need for bringing the regulatory regimes together. It is emphasized by EU on almost all foundations that this is the scale required for coping with giant global threats. This approach has been demonstrated in the encouragement by the EU of renewable energy technologies that reduce the costs for the benefit of the whole world and enlarge the scale of the industrial efforts in the EU and the whole world.

Reaching the temperature targets specified in Paris Agreement is possible by ending the spending on fossil fuel import by the EU on one hand, and developing the current technologies and using new technologies on the other. New technologies and methods are continued to be developed in Europe in order to obtain renewable energy from wind, water, sun and biofuels and new business opportunities are created on these fields. In many countries in the region – Germany has a leading position on this issue – an important part of renewable energy is provided from small scaled local initiatives. With these practices, investment is made to significant improvements in the daily living styles of Europeans and those which are affected from transition to new economic transition – towards zero carbon economy- are supported and thus it is foreseen that all will adapt to the requirements of transformation economy.

Climate change is a threat multiplier and could weaken security and wealth in a series of sectors within and outside the EU, including economy, food, water and energy systems. However, these conditions also bring together important opportunities. Based on the idea that getting away from fossil fuel based economies is a vital part of sustainable development, new economic transformation prepares for an important foundation in increasing the competitive power of EU in the long run at the global scale. As the innovation accelerates and the costs of low carbon technologies continue to fall down, the path of EU could be open to become an industrial leader in the world.[65] These assessments were also included in the Energy Union and Digital Single Market decisions of the EU from different perspectives.[66]

[65] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank/A Clean Planet for All, A European Strategic Long-Term Vision for A Prosperous, Modern, Competitive and Climate Neutral Economy, European Commission, Brussels, 28.11.2018 COM (2018) 773 final.

[66] https://www.covenantofmayors.eu (1st of October 2018).

6.2. EU 2050 Climate-Neutral Vision and Sectors

EU Long Term Vision for a Climate-Neutral Europe by 2050 has adopted seven strategic priorities/ measures or seven building stones on which the Member States should act jointly on the path going to net zero greenhouse gas economy in Europe. These are: energy efficiency; use of renewable resources; clean, safe and link transportation (mobility); modernization of the economy through competitive industry and cyclic economy; infrastructure and interconnections; bio-economy and natural carbon sinks (adsorbents), carbon sequestration and storage applications.

When considered from the point of energy efficiency measures, EU is progressing on the path of mitigating the energy consumption by half by the year 2005 and obtain net zero greenhouse gas emission, including the buildings, by the year 2050. It is expected that the benefits of the energy efficiency strategy of Europe will also increase beyond the borders of Europe. Because in these fields, technical and technological practices such as digitalization and home automation, labeling and standard setting direct the producers of house appliances and electronic devices etc. imported to EU or exported to foreign markets to use EU standards.

EU aims at cutting the emissions arising from transportation by minimum 60% as of 2050.

In Europe, most part of the energy system relies on fossil fuels. All scenarios of the EU demonstrate that this situation will be fundamentally changed by ensuring the commissioning of the use of renewable resources by the middle of this century and major scaled electrification of this energy system, regardless of whether this is for the end user or for the production of carbon-free fuels and raw materials in the industry. Deployment of renewable resources and maximizing the use of electricity with these resources for complete decarbonization of energy supply in Europe, is the most important fundamental stone of 2050 vision.

European transportation sector is responsible from around one fourth of the greenhouse gas emissions produced in the EU.[65] From this perspective, efforts are demonstrated towards supporting decarbonization of the mobility system of the Europe in all transportation forms/modes. The first step of this strategy was determined as ensuring the use of low and zero emission vehicles in transportation which have power transmission units that have high efficiency. It is well known that the EU has been making significant investments in automotive industry particularly in electric vehicles, zero and low emission vehicle technologies in the last ten years. Among the innovation and reformist investments within this framework are the decarbonized, decentralized and digitalized, power, more efficient and sustainable batteries, electrical

By the year 2020, all new buildings in the EU will have almost zero-energy buildings.

power transmission units that have high efficiency, more efficient organization of transportation system based on the principle of digitalization, alternative fuels and smart transportation infrastructure, significant increase in railway network and incentives for the behavioral changes of the society etc. When looked from the point of total benefits, the advantages of a clean and safe mobility system in Europe are clean air, lower noise, traffic with no accident, and it is considered that this situation will provide significant health benefits both for the citizens and the European economy.

The need for EU for a circular economy that has future looking competitive resource efficiency has been pronounced for long in order to protect the current power/ position of the industrial sector. Within this framework, it was calculated that significant devaluation will be seen in the energy need and process emissions with the increase of the production of many industrial commodities such as glass, steel and plastic, and in particular of recycling, as well as the raw materials for carbon-neutral solutions in the whole sectors in European economy.

According to 2050 Vision, it is a principle that sufficient infrastructure is established in the direction to support the developments in energy transmission and distribution in Europe. The vision has significantly emphasized that an economy with net zero greenhouse gas emission could be obtained only by a sufficient and smart infrastructure which provides for sectoral integration and optimum interconnections overall the region. Within this framework, smart electricity/data networks, modernization of important industrial clusters of Europe for hydrogen pipelines etc. in regions where required is in the agenda.

Calculations conducted on the basis of scientific studies demonstrated that the agricultural sector and forestry in Europe are required to provide sufficient food, feed and fiber (yarn, fiber etc.) together with the climate change that affects ecosystems and global land use, with a 30% more population compared to now as of 2050. Here, as a solution, benefits to be expected for a future with net zero greenhouse gas emission are expected from sustainable bio-mass, therefore bio-economy, in the direction of formation of important carbon sinks. Technically/technologically it is possible that the bio-mass could directly supply heat, converted into bio-fuels and biogas and transmitted to gas networks which will replace natural gas after being cleaned, and when these are used for power/ energy production, the CO_2 released could be sequestered and stored to create negative emission. Biomass could be also used in the construction sector similar to biochemicals instead of carbon-intense materials by means of new and sustainable bio-oriented products (textiles, bio-plastic and alloys etc.)[67]. The important issue here is the need to support energy, various industry and construction sectors for these transformations.

One of the strategies of EU 2050 Vision foresees the combatting with (remnant) Carbon Capture and Storage/CCS technology with CO_2 emissions. Whereas Carbon Capture and Storage was considered as one of the important decarbonization options in the power sector and energy-intense industries, looking at the developments such as putting into practice of renewable energy technologies and other options for reducing emissions in the industry sectors, it is considered that the potential of this method is low as of today. However, the Vision indicated that putting CCS into implementation is still required for a carbon-free hydrogen production particularly in energy-intense industries and the transition stage and it was emphasized that CCS would be needed if there is a need for capturing and storing CO_2 emissions

coming from industrial facilities and bio-mass based energy for creating negative emission.

In the vision, it is foreseen that decarbonization of EU economy will have negative responses to its economic and social impacts. Despite the fact that significant amount of additional investment is required in all sectors of the economy for net zero greenhouse gas emission transformation by the year 2050, it is expected that the total economic impacts of this transformation will be positive in the final analysis and that if decarbonization takes place fully, EU economy will grow more than double in 2050 (compared to 1990). However, these estimations do not include the prevented damages of climate change and the adaptation costs related to this.

It is projected that transition to Climate-Neutral economy in the EU will trigger the growth in the new sectors to arise. As of today, the "green jobs" represent 4 million jobs in the EU and some policies and actions for implementing 2020 climate and energy targets for the EU have provided additional contribution of 1% to 1.5% to EU labor force. It is seen that this trend will continue. It is possible that new investments to be made in modernization in industrial sector, energy transmission, circular economy, clean and safe transportation/ mobility, blue infrastructure and bio-economy will create new local and high quality employment opportunities. Whereas the number of jobs increase in the construction, farming, forestry and renewable energy sectors in the EU increases, transition could be difficult for some sectors in the fields of coal mining, oil and gas exploration. The process could be similarly hard for those who are dependent on the activities of such sectors for which economy is expected to decrease. It is obvious that energy intense sectors such as steel, cement and chemicals as well as automobile producers in Europe will see a shift towards new production processes. New occupations, skills, talents and incentives and opportunities to develop these will be required for new job opportunities to arise as a result of this.

Another important factor for the success of the long term vision drawing for a Climate Neutral Europe as of 2050 is the roles of cities and regional administrations in low-carbon transition. In fact, local administrations in Europe have for long been at the focus of practices in relation to being resilient against climate in terms of both mitigation and adaptation policies. In the "Covenant of Mayors for Climate and Energy" initiative wherein the cities and regional administrations in Europe have committed to implement climate and energy targets on a voluntary basis, there are 7.383 signatories.[66] This number represents 198 million citizens of the EU. A research conducted on the climate planning of 885 EU cities demonstrated that around 66% of these cities have greenhouse gas emissions mitigation plans and 26% have adaptation plans[67]. EU's Covenant of Mayors for Climate and Energy is covered within the body of current Global Covenant of Mayors for Climate and Energy at the global level.[68]

[67] D. Reckien et al., How are cities planning to respond to climate change? Assessment of local climate plans from 885 cities in the EU-28, Journal of Cleaner Production, 26 March 2018, https://www.sciencedirect.com/science/article/pii/S0959652618308977?via%3Dihub

[68] The Global Covenant of Mayors for Climate and Energy was established as a single coalition with the merger of EU Covenant of Mayors and the Compact of Mayors in the USA(2014) (Global Covenant of Mayors for Climate and Energy = Compact of Mayors/ComM + EU Covenant of Mayors) As of today, Global Covenant of Mayors for Climate and Energy is the most comprehensive urban climate and energy initiative at the global scale. Cities which have undersigned this Covenant, undertake to mitigate the CO_2 emissions at least by 40% by the year 2030, and adopt an integrated approach for adaptation to climate change. As of January 2019, around ten thousand cities representing 800.000.000 people covering 10.50% of the global population are parties to the Covenant (https://www.globalcovenantofmayors.org/).

The "Urban Agenda for the EU", under which EU Member States, EU Commission and other EU institutions collaborate with countries within intergovernmental framework, supports the cities dimension of EU climate policies.[69] The Agenda is implemented through Partnerships in various areas for better regulation, better financing and better information for the cities in Europe. As two examples, Partnership on Climate Adaptation aims at increasing the capacities of European cities to handle and adapt to the impacts of climate change with agreed common actions, and the Partnership on Energy Transition contributes in the development of smarter and more integrated energy systems in European cities (safer, resilient, low-cost, clean and sustainable energy systems) with appropriate joint actions. Also some other Partnerships such as Partnership on Urban Mobility and Air Quality contribute in the solution of climate and energy problems in the European cities.

Long term vision is considered as an important call to all EU institutions, national parliaments, business community sectors, civil society organizations, city administrations, citizens, social masses (women, disabled individuals etc.) and in particular young people for supporting the leadership of EU in combatting global climate change[70] It is expected that, in the transition to zero carbon economy in Europe with 2050 Climate Neutral Vision, EU economy and industry will develop competitiveness at global markets, it will guarantee high quality jobs and sustainable growth, it will observe social equality and justice principles while implementing all these and support coping with a series of environmental problems such as distortion of air quality and bio-diversity loss.

[69] https://ec.europa.eu/futurium/en/urban-agenda

[70] Disabled: Individual affected from attitudes and environmental conditions which restrict him/ her from full and effective participation in the society under equal conditions with other individuals due to losses at various levels in physical, mental, spiritual and emotional capabilities.

7. EUROPEAN UNION CLIMATE AND ENERGY POLICY

Today, EU has committed for all of its citizens to maintain economic growth by increasing employment while reducing CO_2 emissions by minimum 40% in 2030. Three fundamental targets have been foreseen in the transformation recommended:

1. Putting energy efficiency to the first priority;
2. Reaching the global leadership in renewable energy
3. Protecting the consumers.

Under the light of the political agreements reached in 2018 between European Parliament, Council of Ministers and European Commission, there is a full clarity on the issue of climate and energy targets for 2030. According to this, the new 2030 targets for mitigating greenhouse gas emissions and renewable energy and energy efficiency in Europe are: [71]

- Binding target for a minimum mitigation of 40% in local greenhouse gas (GHG) emissions (compared to 1990 levels) and binding annual GHG emission mitigation targets for EU Member States between 2021 – 2030 for sectors which are not in EU Emissions Trade System (ETS) scope.
- EU has adopted a binding renewable energy target of minimum 32% at EU level by the year 2030 when measured as a share of gross final energy consumption. This target will be reached with the collective efforts of all Member States, and the countries are free to determine their own national contributions.
- The Commission, Parliament and the Council have adopted the decision that includes a binding energy efficiency target of 32.5% in EU as of 2030 in June 2018.[72]

7.1. EU's Energy Union and Climate Priority

The objective of "*A Resilient Energy Union with a Forward-Looking Climate Change Policy*", which is one of the priorities of EU within the framework of "Long Term Strategic Vision for a Climate Neutral Europe by 2050" is to ensure that the energy supply in Europe is safe, viable and equally accessible by all.[73] In order to reach to this objective, smarter energy use and more effective measures are required in combatting climate change. Thus, it is targeted that EU economy will be developed, will draw the investments and create new job opportunities. "Long Term Strategic Vision for a Climate-Neutral Europe by 2050", which was prepared for a modern, competitive and climate-neutral economy in Europe, draws the relevant legal framework on energy union.[74]

[71] "Trends and Projections in Europe 2018/ Progress Towards Climate and Energy Trends of Europe" EEA Report No16/2018 Luxembourg: European Union Publication Office, 2018.
[72] This target was taken by comparison with the 2007 Energy Reference Line Scenario of the Commission.
[73] Energy Union and Climate/Energy union and climate/Making energy more secure, affordable and sustainable (A Resilient Energy Union with a Forward-Looking Climate Change Policy). (https://ec.europa.eu/commission/priorities/energy-union-and-climate_en).
[74] Relevant Legal Regulations: i) Regulation on the Governance of the Energy Union and Climate Action, 2018/1999, ii) Revised Energy Efficiency Directive, 2018/2002, iii) Revised Renewable Energy Directive, 2018/2001, iv) Revised Energy Performance of Buildings Directive, 2018/844.

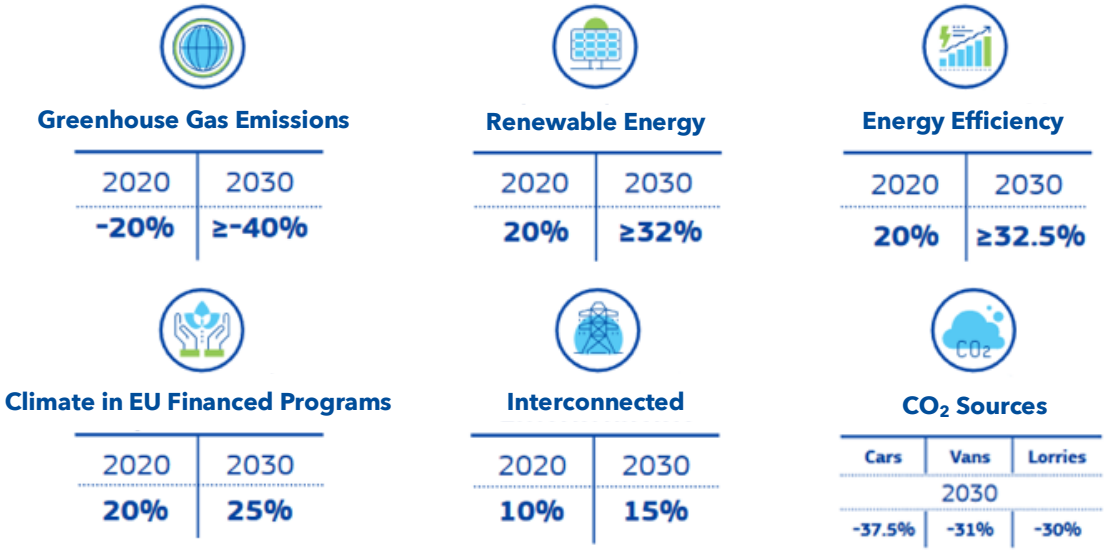
Within this framework, the Fourth Report on the State of Energy Union[75] indicates the progresses recorded in the path of transition to a low-carbon, safe and competitive EU economy and assesses how the EU will lead the Union on the path to Climate-Neutrality.

5 policy areas have been determined in EU Energy Union strategy:

1. Safety, solidarity and trust – close cooperation between Member States in order to diversity the energy resources in Europe and ensure energy safety
2. A fully integrated energy domestic market – free circulation of energy overall EU freely without any technical or regulatory restriction, thus the energy suppliers provided the best energy prices and supporting renewable energy and engaging in free competition
3. Efficiency in energy – mitigating dependence of EU on energy import; cutting/ zeroing the emissions and improving energy efficiency for directing business opportunities and growth.
4. Climate action – decarbonization of the economy, putting into force policies and regulations to cut off/zero the emissions, transition towards low carbon economy and fulfilling commitments of EU towards Paris Agreement.
5. Research, innovation and competitiveness – Supporting innovation and research in low-carbon and clean energy technologies so as to develop competitiveness of EU.

The planned energy sector targets included in the Fourth EU Energy Union Status Report (by making revision towards 2023) are indicated in Figure 2.

Figure 2: *Planned energy sector targets included in 4th EU Energy Union Status Report*



[75] https://ec.europa.eu/commission/publications/4th-state-energy-union_en (Note: EU Energy Union Status Reports are also prepared annually).

7.2. Integrated National Energy and Climate Plans of Member States

EU Regulation on the Governance of Energy Union and Climate Action came into force on 24 December 2018. This regulationcreates a common framework for energy and climate policies for EU and Member States. Together with this Regulation, EU has created a unique and new energy and climate management model in Europe and ensured that the Union and the member countries plan their 2030 targets in this field jointly and collectively and also aimed at providing the transition to a fair and cost-effective Climate Neutral economy for all.

EU thus reconfirmed its commitment to be a global leader on the issue of climate change by remaining loyal to the principle of justice and protecting the citizens of the Union and protecting the natural assets within the framework of Sibiu Declaration.[76] A close collaboration is required between the Commission, Member States and all segments of the society (including stakeholders, social partners and public) for the fulfillment of EU Energy Union commitments.

With the Regulation on the Governance of Energy Union and Climate Action, EU Member States were required as the first time to prepare their Integrated National Energy and Climate Plans (NECPs).[77] The countries are required to develop their NECPs in connection with the following 5 policy areas in EU Energy Union strategy between 2021-2030 within the framework of rules determined with the Regulation in question:

1. Energy safety
2. Domestic market
3. Energy efficiency
4. Carbon removal, and
5. Research, innovation and competitiveness).[78]

- For the period between years 2021 and 2030 (and for each ten year period afterwards), develop National Integrated Energy and Action Plans (NECPs) covering five policy areas of the energy union based on a common template. [79]
- Submit a draft NECP by 31 December 2018[80] and be prepared to send final plans to European Commission by 31 December 2019[81]
- In particular, they need to report the progresses they realize in terms of implementing their NECPS at least once in two years.
- Rules to prepare NECP have been designed so as to take into account the evaluation of opinions of citizens and enterprises as well as regional/ local authorities and the importance of effective public participation and regional

[76] Sibiu Declaration, Informal Meeting of Heads of State or Government, Sibiu, Romania 9 May 2019.
[77] As required by Article 9 of the Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action.
[78] "EU Energy Union Management and Climate Action Rules" came into force on 24 December 2018.
[79]https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/governance-energy-union/national-energy-climate-plans.
[80] NECPs are evaluated by EU Commission. If the targets, policies and measures of a single country do not provide sufficient or consistent contribution in reaching the objectives of EU energy union, or if EU could not take a satisfactory progress towards these targets in a collective manner, the Commission may send recommendations to the countries by 30 June 2019 in order to revise their Draft NECPs. This process has been completed today.
[81]For delivery dates of country NECPs, see:
https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1565713062913&uri=CELEX:52019DC0285#document1
https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1565713062913&uri=CELEX:52019DC0285
https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/governance-energy-union/national-energy-climate-plans

collaboration is emphasized in the development and implementation of NECPs

- Member States have time until the end of 2019 in order to finalize their NECPs. As of 2020, the implementation time slice in NECPs to be finalized is determined as 2021 -2030. EU has determined the date of updating the NECPs as 2024 at the first stage.

It is required that NECPS should be in compliance with both EU long term strategy and the Long Term Strategies of the countries to be submitted by January 2020. Thus, it is projected that NECP practices of EU in the greenhouse gas emission mitigation target of 40% and decarbonization roadmap, will make climate struggle of Europe to a better position by the year 2030.

It should not be ignored that, when NECPs are evaluated from the point of interior practices of countries, they create opportunity for the business and finance sector for mobilizing the private investments required in the energy and climate area and also facilitate for the Member States the financing and investing programming within the framework of multi-annual 2021- 2027 financial objectives of the EU. Besides, as a support and in addition to NECPs, increasing number of regional, municipality and local administrations, as well as the senior structures of the business community prepare their 2050 Climate-Neutral Vision.

The issue of Research and Innovation in NECPs is the key dimension. Including definite and measurable Research and Innovation targets in NECPs, help the integration of national strategies and priorities to 2030-2050 perspective at EU level.[82]

NECPs are designed for transformation of EU economy at a very wide range and represent the objectives and tools for a more respective economy for human and nature, rational and fair use of natural resources, decarbonization, circular economy, efficiency.

At the first stage (as of 31 December 2018), EU commission has made the evaluation of draft plans in the "EU 2020 the State of the Energy Union Report" in order to ensure that the country NECPs prepared as draft are finalized. Within this framework, a report was published on 18 June 2019 which analyzed 28 NECPs as a whole. In the NECPs prepared by Member States in the report in question, some basic findings evaluated by the EU on the basis of countries on the mitigation of greenhouse gas emissions, which are among the important steps in relation to decarbonization of Europe, and efficient use of renewable energy resources, are given below:[83]

Policies, measures and best practices in the transportation sector for the remedial of greenhouse gas emissions in NECPs (draft): In the draft NECPs of Austria and Spain, best practice examples are given on how the qualitative emission mitigation targets in the transportation sector will be merged with the support policies and the measures required for reaching these. Italy gives significant details on the planned measures and passes beyond the target of using renewable energy which is obligatory in the transportation sector. Certain

[82] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid= 1565713062913&uri=CELEX:52019DC0285#document1

[83] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions United in delivering the Energy Union and Climate Action/Setting the foundations for a successful clean energy transition {SWD(2019) 212 final} - {SWD(2019) 213 final}, European Commissiion Brussels, 18.6.2019 COM(2019) 285 final.

number of member countries that have submitted draft NECPs determined electromobility targets that have indicator character and for example Slovenia strengthened the foundation of this infrastructure with concrete measures, including the quantification of the required recharging structure.

For gradual shift to a non-coal stage in Europe with NECPs (draft): Some Member States have prepared or confirmed ambitious targets and time schedules in order to omit coal in the production of electricity. Decoalization targets in some draft NECPs are as follows: The target is by 2022 for French; 2025 for Italy and Ireland; by 2030 for Denmark, Spain, Holland, Portugal and Finland. EU call the countries to provide more indicators on whether they plan to use the option of cancelling EU ETS (Emissions Trade System) quotas and how the Member States who are cancelling the coal actively plan to reach to these targets. It is among the evaluations of EU on NECPs the handling of assistance measures for the workers affected form the cancellation of coal and their families.

Best methodology examples for identifying the renewable energy potential in NECPs (draft): When the national targets in the field of renewable energy of draft NECPs presented are examined, it was seen that Chechia, Ireland and Italy were good examples in terms of having completed their renewable energy targets and roadmaps which ought to be included in the final plans. In the NECPs of Chechia and Ireland, the contribution of each sector and the technologies related to these are given on annual bases and in the type of absolute values. According to NECP of Ireland, this country is one of the few Member States which provide renewable heat according to renewable technology contributions separated by industry, residential and third sector involving the roadmap for biomass supply according to bioenergy demand and raw material. A sensitivity analysis was conducted on Chechia NECP on how the total renewable energy contribution could demonstrate change due to economic growth and energy demand. Italian NECP includes an analysis which takes into account the applicable multipliers of each technology of country's target in the transportation sector.

Triggering the required investments with NECPs (draft): It is an inevitable part of reaching EU Energy Union targets to determine and quantify the investment requirements and potential financing resources expected in the use of renewable energy sources and mitigating greenhouse gas emissions. 11 member countries that provide their NECPs made the estimation of total investment required for their countries in order to reach their targets in these fields (France, Italy and Spain), or some countries (Greece, Finland, Hungary, Ireland, Italy, Latvia, Poland and Romania) have made the estimation of part of investment needs, and details are given on the supply of financing resources of investments. Most of the member countries provided concrete investment figures in their NECPs.

How Do NECPs (draft)[84] encourage "Just Transition"?

Energy poverty affects around 50 million people overall European Union.[85] When viewed from this

[84]In its basic meaning, 'Just Transition' means not imposing the burden of transition to low-carbon economy (whether labor loss in carbon-intense sectors, or distortion of living units of local communities) to the laborers working in fossil fuel based sectors. (Source: "İklim Adaleti Mücadelesi için 10 Durak", Ethemcan Turhan, Arif Cem Gündoğan, Cem İskender Aydın, Mustafa Özgür Berke, Ekoloji Kolektifi Derneği, Haziran, 2017, sayfa 60.

[85]Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions United in delivering the Energy Union and

perspective, there is a need for NECPs to handle the element of energy poverty from a structural point of view and these studies should start to evaluate the number of households, basic characteristics (Family compositions, income levels etc.) and potential geographical intensities In cases where the number is important or certain groups or regions are exposed to challenges in NECPs, in addition to setting a target as an indicator for mitigating energy poverty, the relevant target groups, policies and measures as well as potential financing resources to be needed in this area should be indicated. In some of the draft NECPs, certain positive elements on these issues were encountered. For example, Greece has set certain targets for fair transition, there are detailed evaluations on this issue in Italy, Malta and Finland NECPs.

Status of NECPs (draft) taking into account the Climate-Neutral long term vision of the EU: More than half of the draft NECPs include 2050 targets and visions in different details. Denmark, Spain, France, Holland, Portugal and Sweden aim at being in the position of a country which is not affected from climate (climate neural) with their NECPs by the year 2050. France and United Kingdom NECPs have put 2050 targets in their internal regulations and made these legally binding. Holland, Portugal and Sweden increased their 2030 greenhouse gas targets in order to be in compliance with long term targets. Other Member States which have the targets of decarbonization for 2050 are Chechia, Germany, Estonia, Ireland, Italy, Lithuania, Hungary, Austria and Finland.

Status of NECPs (draft) from the point of adaptation targets: Many member countries which have adaptation targets in their NECPs included their draft adaptation plans in their NECPs and some countries have set new targets. In the NECPs of a couple of countries, there are details on adaptation measures. Draft NECPs of Ireland, Lithuania, Poland, Slovakia and Slovenia are best practice examples on how the adaptation targets and measures could be covered. Only few number of countries provide detailed information on the importance of adaptation to negative impacts of climate change in relation to the energy supply of the EU in their NECPS.

Climate Action/Setting the foundations for a successful clean energy transition {SWD(2019) 212 final} - {SWD(2019) 213 final}, European Commission Brussels, 18.6.2019 COM(2019) 285 final, sayfa 20.

8. ADAPTATION TO IMPACTS OF CLIMATE CHANGE IN EUROPEAN UNION

Adaptation means estimating the negative impacts of climate change in advance and taking suitable measures for preventing or minimizing the damages that these could cause, or benefiting from the potential opportunities that could arise. It was demonstrated that well planned early adaptation actions saved human and financing resources afterwards. Examples of adaptation measured include more efficient use of scarce water resources, adaptation of structuring rules according to future climate conditions and extreme weather conditions, constructing flood barriers and leveraging set levels, developing crops that demonstrate tolerance against scarcity, selecting tree species and forestry practices that are less sensitive against storms and fires, and opening terrestrial corridors in order to assist the migration of species.

Climate change has currently brought together a series of impacts in different dimensions on ecosystems, economic sectors and human health in Europe. Researches demonstrate that, only depending on climate change, the damage which is annually determined on the critical infrastructure of Europe could increase by ten folds as of the end of century with the ordinary business scenarios and it is demonstrated that this will cause losses in the industry, transportation and energy sectors.

Policies for adaptation to the impacts of climate change in the EU have been developed and implemented since the beginning of 2000s. The need in Europe to adapt the changing climate has been included in the assessments as the first time in 2005.

With the Green Paper (2007) on Adaptation to Climate Change in Europe, which was prepared for adaptation to the impacts of climate change under the scope of Second European Climate Change Program (ECCP), which was published in 2005, adaptation has become an inseparable part of climate change policies of the EU since that date[86].

In the Green Paper, the importance of adaptation in the fields of water sources, agricultural sector, human health, coastal areas which are affected by climate change has been emphasized and light was shed on studies and negotiations which should be immediately handled on this issue within the body of EU. The Green Paper indicates that despite the fact that the impacts of climate change demonstrate significant differences between regions, the European regulations that affect the decision down to local level/ member countries have a role to play.

This situation is particularly relevant in relation to common policy areas such as agriculture and water products and the environmental regulations. As a matter of fact, in the Communique No. COM (2007) 414 that was published on 18 July 2007 by the European Commission, the Green Paper was taken as a reference and it was foreseen in that period that the issue of drought should first be handled within the body of Water Framework Directive (WFD) No. 2000/60/EC, which is being implemented Europe-wise and aims at smart water management.

[86] Green Paper: Document with consultative character prepared by the European Commission in order to launch a discussion and consultancy process at European level by presenting a recommendation on a certain area. Results of the discussion and consultations covered by Green Paper could constitute the subject of a White Paper.

In the following step, the Adaptation Action Framework of EU was drawn in a comprehensive manner with the White Paper that as adopted in 2009[87]. White Paper, which foresees encouragement of research and education policies for proactive adaptation policies in Europe and which makes evaluations in relation to the cost and benefits of climate adaptation in Europe, emphasized that one of the working areas of EU European Innovation and Technology Institute was the adaptation to climate change.

Another step in the White Paper in relation to adaptation was to created the "Clearing House Mechanisms" as a database and information technology tool on impact, affectability and best adaptation examples. The Clearing House Mechanism, which was put into life in 2011, has been contributing in the environmental information system of integrated EU Shared Environmental Information System (SEIS), which is managed by the European Commission and European Environmental Agency (EEA) and is shared with the Member States, and the geographical information of EU which is provided by EU Global Monitoring for Environment and Security (GMES) is used.

The White Paper also listed some measures towards the implementation of adaptation policies towards impacts of climate change as follows:

- Developing technologies important for adaptation;
- Using scientific techniques (in particular monitoring and estimation techniques);
- Access to developed climate data and regional climate models;
- Creating capacity development and risk management and risk mitigation approaches
- Continuing the EU support for Nairobi Work Program[88]
- Providing additional financing from suitable resources in order to cover the adaptation costs in less developed and developing countries.
- Researching multi-lateral insurance options which will complement the existing fund mechanisms in case of natural disasters in relation to climate change.

European Union Council, which ratified the first "EU Adaptation Strategy" in the process in April 2013, published the results of the Strategy on 18 June 2013[89] and shared these results with European public on 21 June 2013[90]. The Strategy, which aims at making Europe more resilient against climate, aimed at strengthening the coordination between all management organs of the EU with a consistent approach in order to adapt to the impacts of climate change. EU Adaptation Strategy is directed towards three fundamental targets:[91]

[87] White Paper: It is a document prepared by the European Commission which includes concrete recommendations in the issue handled by reflecting the opinions of shareholders in the design of final policy framework towards the Union actions on a specific issue. In some cases White Paper is a continuity of the Green Paper and translates the results concluded in the Green Paper into recommendations.

[88] Nairobi Work Program: The purpose of the Program., which was established with Decision No. 2/CP.11 in the 11th Conference of Parties of UNFCCC (Montreal 2005) which was named as Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change in the 12th Conference, is determined as to provide assistance to least developed countries and small island states and other developing countries and all party countries in general on understanding the impacts of and vulnerability against climate change, as well as adaptation processes, making assessments in relation to these, taking into account the current and future climate change to make suitable scientific, technical assessments against climate change, and developing adaptation measures based on scientific, technical and socio-economic foundations against climate change taking into account the future of climate change.

[89] https://www.europeansources.info/record/conclusions-on-an-eu-strategy-on-adaptation-to-climate-change/

[90] "Council conclusions on climate change: An EU strategy on adaptation to climate change", Economic and Financial Affairs, Council Meeting, Council of the European Union, Luxembourg, 21 June 2013.

[91] https://ec.europa.eu/clima/policies/adaptation/what_en

1. Supportive Action by Member States: EU Commission is to encourage all Member States towards adopting comprehensive adaptation strategies (Currently the strategy exists in 25) and to develop adaptation capacities of the countries and support them engage in actions in this field. Besides, supporting adaptation in cities by means of *EU Covenant of Mayors for Climate and Energy*.
2. Ensuring that the infrastructure of Europe is more flexible/resilientand supporting use of insurance against disasters of natural and human origin,[92] and supporting adaptation in fragile sectors such as agriculture and fishery and realizing climate-proofing action at EU level.
3. Focusing on the gaps in the information in the field of adaptation and further broadening European climate adaptation platform and making better informed decisions (ClimateADAPT).

Cities play a central role in the implementation of EU's climate resilience policies by means of ensuring adaptation as important population and infrastructure centers. Besides, integration of planning policies and adaptation could create further opportunities for EU mayors and political leaders for the cities to be more livable.

Taking into account the success of EU Covenant of Mayors and in accordance with the same management model, an initiative was launched by European Commission in 2014 where mayors would be included for adaptation to climate change. The Commission has invited the cities to make political commitments and foreseeing inevitable impacts of climate change and the measures taken. The initiative in question titled Mayors Adapt, which is being carried out by Climate Action DG of the European Commission and which will be the basis for the implementation of EU Adaptation Strategy, aimed at encouraging the municipalities to develop comprehensive local adaptation strategies and to engage in commitments in this direction.

Cities which participate in Mayors Adapt committed to contribute in the general purpose of EU Adaptation Strategy by creating a comprehensive local adaptation strategy or integrating adaptation to climate change with the existing plans. The initiative also increased the support to local authorities for the establishment of local platforms in order to provide for a cooperation environment with a wider network between the municipalities and raised public awareness on the issue of adaptation measures required in the cities.

The initiative is being supported by European Environment Agency (EEA) and its outputs are included in the European Climate Adaptation Platform (ClimateADAPT) and works of European Environment Agency. Mitigating the emissions and ensuring adaptation to climate impacts in urban infrastructures and other sector practices, are important elements in constructing sustainable cities. Mayors Adapt initiative also showed the path to local managers with the practices in this area for the sustainability of European cities.

Five years after the adoption of EU Adaptation Strategy, European Commission has prepared a report that reviews the practices and evaluated the

[92] Green Paper on the insurance of natural and manmade disasters, 2013 (https://climate-adapt.eea.europa.eu/metadata/publications/green-paper-on-the-insurance-of-natural-and-man-made-disasters).

progress achieved and the lessons learned. After the evaluation report was presented to the consultation of Europe public in December 2017 – March 2018 period, it was published on 12 November 2018 with the title of "Report on the Implementation of the EU Strategy on Adaptation to Climate Change"[93].

Some important findings and recommendations included in this report are as follows:

- EU has reached Adaptation Strategy targets and accomplished progress in a series of actions. However, Europe is still fragile against the impacts of climate change.
- The Strategy has been a reference point for preparing Europe against climate impacts in many fields. The commission will continue works towards the targets of the strategy.
- It has been clearly seen since 2013 that, international climate action as it was indicated in Paris Agreement should be continued at the warming levels of 1.5°C or 2°C, and the expected impact should be adopted.
- Adaptation could ben should be a strong ally of efforts to mitigate sustainable development and disaster risks. EU policy should create a synergy among three policies (which are indicated above) in order to prevent the losses due to the future impacts of climate change and thus long term economic and social wealth should be enabled in Europe and other countries.
- The adaptation should also support EU's biodiversity and also be supported (nature based solutions). Today many EU Member States have developed their national adaptation strategies and continue their practices with action plans. When the national adaptation strategies of EU Countries are examined, it could be observed that more focus is put on "soft adaptation" measures such as producing comprehensive information in this area and/ or integration adaptation to sectoral policies (mostly handled sectors and issues; agriculture, water, forestry, human health and biodiversity"[94]

South Europe will be Affected the Most

There is a clear separation between South and North in geographical position in Europe in terms of the impact areas of climate change.

Countries in South Europe will be more affected from global heating compared to those in North.

Particular areas of impact on the south are deaths due to hot air waves, loss of water resources, habitat, demand for energy for cooling and forest fires.

- Since different regions will face different impact problems in Europe, it is important that these strategies are adapted according to regional and local situations. For example, whereas it could include investing in storage facilities for providing water to crops in case of any drought to occur in agricultural/ rural regions, there could arise the need to create

[93] COM(2018)738 (https://www.europeansources.info/record/report-on-the-implementation-of-the-eu-strategy-on-adaptation-to-climate-change/).

[94] Methods of adaptation to the impacts of climate change could be examined under two separate categories. These are soft adaptation and hard adaptation. Soft adaptation measures mainly put the weight on information accumulation, setting strategies and policies, creating capacity and institutional regulations. For example management of energy demand, including water quality standards to regulations, disaster management modelling, pricing etc. Hard adaptation methods are the structural measures towards applications that involve use of certain technologies and measures. For example, flood prevention structures, sea walls, rain water collection structures etc.

more green area in order to protect humans from the heat waves in urbanized regions.

- Efforts should be demonstrated to protect the citizens living in EU cities against climate dangers and ensure their trust in an effective adaptation. EU city adaptation plans should take into account different risks which different regions face with on the European continent.
- Infrastructure projects should be realized which are resilient against floods or extreme temperatures, as well as rise of sea level, which are financed by the EU budget.
- The contribution of the private sector towards strengthening resilience among society against the impacts of climate change should be encouraged. These actions should be continued to be strengthened by means of EU Commission Action Plan on Financing Sustainable Growth'[95] and regulatory proposals adopted in 2018 and afterwards.
- For specific adaptation needs, climate services should be converted into business opportunities based on reliable and standardized data and incentives provided by Copernicus and other European World observation initiatives.
- Adaptation models and scientific data specific to the region (Europe) have been prepared with EU Horizon 2020 research programs and projects and these should be continued.

All these findings were further strengthened with the works of Joint Research Centre/JRC[96]. As a result of JRC reports which investigate the impact of climate change on economy, society and environment in Europe, if the global warming continue to increase more than 2°C compared to pre-industrial levels and suitable measures are not taken, Europe will face with more frequent and extreme weather conditions and this situation will have important economic impacts. The evaluations on how the situation of Europe will be in the scenario where the global warming increases to 2°C are below:[97]

- Increasing temperatures and temperature crisis will bring additional 132.000 heat borne deaths annually, and decrease the labor efficiency in some countries of South Europe by 10-15%.
- Changes in flower/ plant blossoming, growing seasons and changes in soil – water content will affect agricultural efficiency and habitat and reveal the potential that the drought climate area will be doubled.
- Sea levels will rise along the coastal band of Europe and this situation will cause an increase of 5 folds in the coastal flood damages.
- Three times more people will suffer river floods and the river flood damage which is 5.3 billion Euro annually in EU economy will rise to 16.5 billion Euro/ year.
- Demand for energy towards heating will decrease, however the energy requirement for cooling will rapidly increase.
- South parts of Europe could encountered increasing water scarcity and more drought and the water resources will generally increase in North Europe.

[95] https://ec.europa.eu/info/publications/180308-action-plan-sustainable-growth_en

[96] Joint Research Center / JRC is a field of science and information of EU Commission that could hire scientists in order to carry out researches for supporting EU policy and providing independent scientific consultancy. JRC provides support for the realization of 10 policy priorities of the Commission, which also include "Energy Union and Climate".

[97] https://ec.europa.eu/jrc/en/news/climate-change-human-and-economic-outlook-europeans.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9. EU AND CLIMATE FINANCING

European Union has started to determine the financing strategies in the field of combatting climate change with an approach that takes into account the commitments under Paris Agreement for a Europe that has low carbon and climate resilience. 2015 Paris Agreement has defined financial mobility and encouraging incentives that increase low emission and climate change resilience as an objective and this objective was renewed in the 22nd Conference of Parties in 2016 (COP22, Marrakesh) by giving open/clear messages to countries towards encouraging long term climate investments for transformation into low carbon economies.

There is a need for significant investments in the Europe in the fields of both mitigation and adaptation for the expected transformation. Whereas the researches demonstrate that the financing resource to be needed overall Europe will significantly change depending on the scope, scale or methods, it is foreseen that this amount will rise up to hundreds of billions of Euros. It is apparent that the finance sector has a critical role here. It is considered that in this transition period wherein the transformation of economies is required (towards low carbon, carbon-neutral economies), only the public sector investments would not be sufficient in financing and the Member States should support by making arrangements for the mobilization and utilization of private capital.

Among the fundamental challenges in front of increasing the climate friendly investments in EU are the barriers which extend and encourage activities which could not be sustained in the existing finance system. Let aside demolishing these barriers, it is known it is difficult to direct the existing funds to activities which increase resilience towards the impacts of climate change and which mitigate carbon emissions. Another important issue is that in order to carry out effective financial policies in combatting climate change, the investment needs should be managed at all levels in a systematic way (European, national and local).

With the EU Clean Energy Package, which is being implemented for a low carbon and climate resistance Europe, the EU targets minimum 40% cut off in greenhouse gas emissions and a minimum target of 32.5% for energy efficiency and of 32% for renewable energy until the year 2030. The package also emphasizes the importance of transition to clean energy and the economic benefits of this transition. According to this, the package which was proposed for mobilizing public and private investments up to 177 billion Euros every year after the year 2021, could also create GDP increase of 1% and create 900.000 new employment opportunities.[98]

In order to reach to these targets, there is need for the commitment of countries as well as detailed solutions on plans to direct the investments and financial needs as mentioned in the low carbon development strategies at the country scale. Although many Member States implement their climate mitigation/ adaptation strategies and action plans, it could be seen that they do not have a vision that is compliant with decarbonization targets of EU at national level and they do not have any evaluation

[98] https://www.eea.europa.eu/tr/articles/iklim-finans-dusuk-karbonlu-iklim

in relation to how the activities in question will be financed.

European cities have for long time been implementing their creative funding methods by developing new resources such as mass funding of climate bonds or bringing together different fund resources. However, it is known that many municipalities face with challenges on the issue of financing the measures for combatting climate change. At the top of these challenges is the lack of capacity and expertise on the issue of finding resources and implementing the most suitable finance option.

Besides, adaptation measures which are to be taken in order to be resistant against climate are not considered as "earning investment" by the financial decision makers in most of the cases. It is foreseen that this situation will change with the increase of awareness on additional benefits of climate risks and adaptation measures.

The approach of EU in climate finance policies is two-layered: The first is the provision of direct grant funding to the poorest and most vulnerable/fragile countries, and the second is the merger of loan and equity grants from public and private sources including bilateral and multi-lateral development banks and using grant funding to increase special investment.

At the beginning of year 2018, EU has declared an ambitious and new "Sustainable Growth Financing Action Plan" related to the foundations of financing system which will support sustainable development agenda and combatting climate change in Europe. In the plan which was prepared for greener and cleaner economy in Europe, it was emphasized that an investment of minimum 180 billion Euro was required for every year for the actions and policies determined by the EU for combatting climate change and it was explained that it was necessary to adopt new principles in terms of finance and economy policies of the Union in order to 2030 greenhouse gas mitigation targets.

From this perspective, it is considered that the plan will provide correct signals for the investors on the way that goes to transition to low carbon economy, and to a resource efficient and circular economy.

9.1. European Union and Global Climate Financing

Significant financial resources are required in order to help the developing countries implement Paris Agreement and combat climate change. EU is the biggest contributor of public climate finance for developing countries together with the Member States, investment banks and various fund mechanisms, and the amount of contribution only in year 2017 was 20.4 billion Euros.[99]

Within the scope of 2014-2020 Multiannual Financial Framework/MFF[100] EU resolved to use 20% of its total budget for projects and policies related to

[99] https://ec.europa.eu/clima/policies/international/finance_en

[100] Multiannual Financial Framework is a mechanism that is created to ensure that EU expenditures are subject to a projectable and also a tight budgetary discipline. MFF defines the maximum amounts that exist for each main expenditure area for the EU budget in a period of 5-7 years. MFF determines the "de facto" political priorities for the coming years and in this respect it creates both a political and budgetary framework.

climate for developing countries (annually 2 billion Euros on average), and the implementation is ongoing.

This rate corresponds to 14 billion EU when considered from the point of climate financing for the developing countries within the context of foreign expenditure and financial aids. EU Commission has recommended to increase this share to minimum 25% for 2021-2027 period.

One of other important finance channels for EU to support specific, targeted climate action and policy dialogue in developing countries is the Global Climate Change Alliance Plus/GCCA+. What is expected with this alliance is to develop the policy dialogue and collaboration between EU and developing countries on the issue of climate change.

GCCA+, which has been active since 2008, has invested around 450 million Euro for more than 60 country based and regional action.

GCCA+ strongly focuses on Least Developed States (LDSsand Small Island Developing States (SIDS) which are very fragile against climate change. Within this framework, the priority areas where GCCA+ provided support in these countries are as follows:

- Inclusion of climate change in the national development strategies
- Increasing resilience
- Supporting the formulation and implementation of adaptation and mitigation strategies.

Besides, some EU Member States and regional institutions also provide 95% of their annual voluntary commitments as contribution in order to provide for the operation of Adaptation Fund that was created by the Kyoto Protocol.

In 2018, European Commission has increased the climate financing towards developing countries and provides 2.8 billion Euros. In addition to this, European Investment Bank has provided 2.6 billion Euro as climate financing to the developing countries in 2017. This for example finances the energy efficiency and renewable energy projects in Africa and other regions and generally the funds are compared with the institutions of Commission and EU Member States.

9.2. Financing of Adaptation

EU provides important amount of financing to the non-member developing countries for their adaptation activities.[101] Climate change adaptation activities of EU integrated to all sectoral policies are supported using five European Structural and Investment Funds/ESI Funds. These are: European Regional Development Fund/ERDF, European Social Fund/ESF, Cohesion Fund/CF, European Agricultural Fund for Rural Development/EAFRD, European Maritime and Fisheries Fund/EMFF.

In addition to these fund resources, EU has other financing instruments which it supports for foreign countries. For example, Horizon 2020, which supports research and development on climate change adaptation; LIFE which finances many different projects related to climate adaptation, environment and emission mitigation and EU Solidarity Fund that is created for natural disasters.

[101] https://ec.europa.eu/clima/policies/adaptation/financing_en

Investments for adaptation to the impacts of climate change are also integrated with financing and loans by European Investment Bank (EIB) and European Bank for Reconstruction and Development (EBRD).

9.3. Contribution in Green Climate Fund

A commitment of 10.3 billion USD has been collected by the developing countries since 2014 in the Green Climate Fund (GCF) established in 2010 in order to support mitigation of greenhouse gas emissions and adaptation to climate change. EU has declared that it will provide increasing contributions to the target of providing 100 billion USD per year by 2020 which the developed countries jointly committed within the scope of Green Climate Fund in the framework of public, private, bilateral and multilateral mechanisms, including alternative finance resources[102].[103]

[102] EU and Member States have undertaken almost half of this amount (4.7 billion USD).

[103] "On Future: Paris Climate Agreement", European Union, Turkey Delegation document.

10. EVALUATION

European Union has been continuing the combat with climate change since 2007 by establishing concrete targets. The Union has determined its first digitalized targets around 13 years ago within the scope of climate and energy package it has adopted in March 2007, and accordingly committed to mitigate the greenhouse gas emissions by 20% in 2020 compared to 1990 level; provide 20% of its total energy consumption from renewable energy resources and provide a mitigation of 20% in primary energy use due to energy efficiency[104]. This targets were referred to as "20x20x20 targets" for a long period of time.

The process of renewal of targets and developing climate policies in European Union could be followed with the INDC of EU which was presented to UNFCCC Secretariat in March 2015 (target of mitigating the emissions by minimum 40% until 2030) and currently with "Long Term Vision for EU 2050 Climate-Neutral Europe".

In order to foreseen the extent to which these policies addressing the mitigation and adaptation targets of EU are or will be realized, one should highlight the scientific study volume of the Union in combatting climate change and in particular the research issues still needed in relation to adaptation to the impacts. While listing these requirements, EEA particularly underlined that there is a need for researches on the integrated and inter-sectoral impacts of climate change. The fundamental reason for this is that impact studies of climate change in the EU have focused only on the relevant single sector typically and in the current status. Other important reasons include the lack of sufficient knowledge in Europe on the issue of inter-sectoral sensitivities and the indirect impacts of climate change and solutions related to adaptation. All of these still stand as an important obstacle in the development of cost effective and evidence based adaptation for the EU.[105] This picture demonstrates that some disharmonies will arise in relation to fulfilling the actions targeted in 2050 Climate Neutral Vision with the existing information and scientific researches. As a matter of fact, in EU 2050 Vision, when we examine all policies, risks, opportunities and needs that address the adaptation and/ or mitigation targets, a series of issues which should be studied are indicated below:

- There is very little knowledge in Europe on integrated or inter-sectoral climate change impacts.
- It is hard to verify the climate change impact models, it is estimated that testing the reference impact estimations in accordance with reference information and the data will increase reliability of these models. Under some conditions, it could be necessary to develop alternative method which do not include reference data.
- There is little information on the intended results and common benefits of adaptation options in many sectors.
- There is a need to monitor and evaluate in a more coordinated manner the mitigation and adaptation practices at local and national levels

[104] EU Climate and Energy Package, 2007.

[105] European Environment Status and Overview, 2015, European Environment Agency, Section 23, p: 1304-1306 (http://www.eea.europa.eu/soer-2015/synthesis/report/table-of-contents).

towards climate change in both public and private sector.

- Evaluating the adaptation strategies in EU member countries by determining different time scales will be more beneficial towards decision making at regional scale. Although there are certain tools for reporting the national actions in this field (such as EU ClimateADAPT), there is no information exchange mechanisms which is continuous at country and regional scale, or a consistent monitoring method.
- As of today, whereas relatively good economic methods and tools are being implemented in relation to cost estimation and evaluation of specific options for flood measures, water, energy and agricultural sectors in EU, cost estimations are still high for other sectors (For example, biodiversity, business and industry and health costs of the population etc.) It is an issue that should be further evaluated whether these costing information is useful in decision making. For these reasons, there is a need to perform separate studies in order to make economic evaluation for almost all sectors with the decision making authorities.
- The need for climate information at local level is still continuing in Europe and the closure of this gap will help providing more robust information to the decision makers.
- There is a need to conduct further researches on the impacts of climate change on critical infrastructure, including transportation, water and energy resources and health services.
- Additional researches are required on the issue of role of governance (national, local institutions and other stakeholders) in adaptation to the impacts of climate change for implementing the measures in urban environments including food safety, extreme temperatures, heating and urban planning.
- The impacts of extreme upper scenarios of climate change (more than 4°C of average global heating, higher temperature changes in Europe etc.) are unknown. These scenarios have been prepared recently and there is still a need for carrying out relevant impact studies overall Europe.
- It is apparent that more studies to be conduced towards the impacts of climate change for urban development will provide background information to the policies in this field. There is lack of information on resilience of cultural landscapes and communities as well as how the adaptation will be managed in low technology landscapes (marginal in terms of productivity)
- There is a need for more research on the issue of monitoring the impacts of climate change in Europe on forests in middle and long term and making projectional modelling of wild life distribution in order to better address the planning policies on adaptation to impacts. Besides, there is still lack of knowledge on the impact of climate changes and climate extremities on the carbon sequestration potential of agricultural and forest systems.
- Researches in relation to the impact of climate change on transportation sector in Europe are still insufficient. In particular, there is a need for more research on the issue of resilience of highway and railway infrastructure and in the origin airports (which have economic nationality) and interim and final targets, as well as changes in air traffic volumes, changes in air traffic demand.
- There is still a need for more planned monitoring of the droughts in order to strengthen the management of crop production in agricultural sector in Europe against the impacts of climate change. In this scope, it is necessary to support the maintained researches with remote detection, increasing

CO_2 emissions, combined impacts of increasing CO_2 emissions and extreme heat and drought on crops and pasture lands.

- There is a need for researches in order to determine the resilience of population against weather conditions, including the practices made against heat waves and flood risks. Besides, research is required on how the EU could mitigate social inequalities in Europe within the framework of adaptation policies.
- There is a need to develop increased risk models for vector-borne diseases (human and animal diseases) in order to support health planning and supervision for the purposes of researching the impacts of climate change on human health.

REFERENCES

- Avrupa Çevre Durumu ve Genel Bakış, 2015, Avrupa Çevre Kurumu, Bölüm 23, s: 1304-1306 (http://www.eea.europa.eu/soer-2015/synthesis/report/table-of-contents).
- Aydın, A.H., Çamur, Ö., (Mart, 2017) "Avrupa Birliği Çevre Politikaları ve Çevre Eylem Programları Üzerine bir İnceleme",
- Avrupa Komisyonu, COM (2017) "Avrupa'nın Geleceğine ilişkin Beyaz Kitap", 2025'e kadar AB27 için Değerlendirmeler ve Senaryolar, 2. Avrupa'nın Geleceğinin Yönlendiricileri, Güvenlik ve Sınırlar Konusunda Artan Tehditler ve Endişeler.
- JRC, (2018) "Avrupa'da İklim Etkileri: JRC PESETA III Projesi, Final Rapor", "JRC Politika için Bilim Raporu".
- EEA (2018) "Avrupa'da Trendler ve Tahminler 2018/Avrupa'nın İklim ve Enerji Trendlerine Doğru İlerleme", No 16/2018, Lüksemburg: Avrupa Birliği Yayın Ofisi.
- Budak, S., (2000) Avrupa Birliği ve Türk Çevre Politikası, Büke Yayınları, İstanbul.
- COM SWD (2019) Setting the foundations for a successful clean energy transition European Commission Brussels.
- COM(2018)738 (https://www.europeansources.info/record/report-on-the-implementation-of-the-eu-strategy-on-adaptation-to-climate-change/).
- COM (2013) "Council Conclusions on Climate Change: An EU Strategy on Adaptation to Climate Change", Economic and Financial Affairs, Council Meeting, Council of the European Union, Luxembourg, 21 June 2013.
- D. Reckien et al., (2018) How are cities planning to respond to climate change? Assessment of local climate plans from 885 cities in the EU-28, Journal of Cleaner Production, https://www.sciencedirect.com/science/article/pii/S0959652618308977?via%3Dihub
- Erdoğan S. (2018)."İklim Değişikliğine Karşı Verilen Küresel Mücadele ve Avrupa Birliği", Recep Tayyip Erdoğan Üniversitesi, İİBF, Uluslararası İlişkiler Bölümü, MANAS Sosyal Araştırmalar Dergisi, 2018 Volume: 7 Issue: 4, 703-718.
- EU Climate and Energy Package, (2007).
- COM (2009), EU Action Against Climate Change, Leading Global Action to 2020 and Beyond, Brussels.
- Euractive (2007). Energy and Climate Change: Towards an Integrated EU Policy.
- http://www.euractiv.com/en/energy/energy-climate-change-package/article-160957
- The EU Climate and Energy Package (2007): EU website: Environment.
- http://ec.europa.eu/environment/climat/climate_action.htm
- Avrupa Birliği Türkiye Delegasyonu bülteni "Geleceğe Dair: Paris İklim Anlaşması,", Ankara.
- Green Paper on the Insurance of Natural and Manmade Disasters, (2013) (https://climate-adapt.eea.europa.eu/metadata/publications/green-paper-on-the-insurance-of-natural-and-man-made-disasters).
- Hans Bruyninckx, AÇA İcra Direktörü, 04/2016 sayılı AÇA bülteninde yayımlanan başyazı, December 2016 https://www.eea.europa.eu/tr/articles/iklim- finans-dusuk-karbonlu-iklim.

- Turhan,E., Gündoğan, A.C., Aydın, C.İ., Berke,M.Ö., (2017) "İklim Adaleti Mücadelesi için 10 Durak", Ekoloji Kolektifi Derneği, Haziran, page 60.
- İklim Diplomasisi için Konsey Kararları (Council conclusions on Climate Diplomacy), (18 February 2019).
- In-Depth Analysis in Support of the Commission Communication COM(2018) 773/A Clean Planet for all/A European Long-Term Strategic Vision for a Prosperous, Modern, Competitive and Climate Neutral Economy, European Commission, Brussels, 28 November 2018.
- Kiraz, D.E. (2019). "İklim Değişikliğinin İnsan Sağlığına Etkileri", İklim Değişikliği Eğitim Modülleri Serisi 5, T.C. Çevre ve Şehircilik Bakanlığı, Ankara.
- Schreurs, M. A. (2016). "The Paris Climate Agreement and the Three Largest Emitters: China, the United States and the European Union. Politics and Governance", 4(3): 219-223.
- Talu, N.(2004), "TBMM'de Çevre Siyaseti", Nobel Yayınevi, Ankara, 2004.
- Talu, N.(2006)."Avrupa Birliği Uyum Sürecinde Türkiye'de Çevre Politikaları",TMMOB Çevre Mühendisleri Odası yayını, Ankara, ÇMO Kitaplığı: 06-01.
- Talu, N.(2009)."Avrupa Birliği Çevre Politikası", Avrupa Birliği'ne Giriş, Tarih, Kurumlar ve Politikalar, İstanbul Bilgi Üniversitesi Yayınları, Istanbul, pp: 183-200.
- Talu, N.(2009)."Yerel Yönetimlerde AB Çevreciliği/Uyum Sorunları", Nobel Yayınevi, Ankara, Edition No:1385.
- Talu, N.(2015)."Türkiye'de İklim Değişikliği Siyaseti", Phoenix Yayınevi, Ankara.
- Temel AB Terimleri, T.C.Avrupa Birliği Bakanlığı (www.ab.gov.tr).
- Tolunay, D. (2019). "İklim Değişikliğinin Ekolojik Sistemlerdeki Yeri", İklim Değişikliği Eğitim Modülleri Serisi 5, T.C. Çevre ve Şehircilik Bakanlığı, Ankara.
- T.C. Tarım ve Orman Bakanlığı,(2018) "Toprak Organik Karbonu Projesi/Teknik Özet", Çölleşme ve Erozyonla Mücadele Genel Müdürlüğü, TÜBİTAK BİLGEM/YTE, Ankara.
- Türkeş, M. ve Kılıç, G. (2004). "Avrupa Birliği'nin İklim Değişikliği Politikaları ve Önlemleri/European Union Policies and Measures on Climate Change". Çevre, Bilim ve Teknoloji, Teknik Dergi, 2: 35-52.

Internet References

- https://ec.europa.eu/commission/priorities/digital-single-market_en
- https://www.globalcovenantofmayors.org/
- https://ec.europa.eu/futurium/en/urban-agenda
- https://ec.europa.eu/environment/forests/eu_comm_2019.htm
- https://yesilekonomi.com/ab-ulkelerinde-iklim-endisesi-yukseliyor/?utm_source=newsletter&utm_medium=email&utm_campaign=osb_lerde_yenilenebilir_yatirimlari_sinirlandirildi_guenluek_buelten&utm_term=2019-08-06
- https://ec.europa.eu/clima/policies/adaptation/how/territorial_en
- https://ec.europa.eu/clima/policies/adaptation/how/sectors_en#tab-0-0
- https://europa.eu/rapid/press-release_MEMO-04-43_en.htm?locale=en
- https://unfccc.int/process/the-paris-agreement/status-of-ratification
- http://pewclimate.org/projects/pol_review.htm
- https://ec.europa.eu/environment/action-programme/objectives.htm

- https://ec.europa.eu/commission/sites/beta-political/files/juncker-political-guidelines-speech_en.pdf
- https://ec.europa.eu/commission/publications/reflection-paper-towards-sustainable-europe-2030_en
- https://ec.europa.eu/clima/policies/eccp/first_en
- https://ec.europa.eu/clima/policies/eccp/second_en
- https://europa.eu/rapid/press-release_IP-18-6543_en.htm
- https://ec.europa.eu/commission/publications/4th-state-energy-union_en
- https://ec.europa.eu/commission/priorities/energy-union-and-climate_en
- https://www.europeansources.info/record/conclusions-on-an-eu-strategy-on-adaptation-to-climate-change/
- https://ec.europa.eu/clima/policies/adaptation/what_en
- https://ec.europa.eu/info/publications/180308-action-plan-sustainable-growth_en
- https://ec.europa.eu/jrc/en/news/climate-change-human-and-economic-outlook-europeans.
- https://www.eea.europa.eu/tr/articles/iklim-finans-dusuk-karbonlu-iklim
- https://ec.europa.eu/clima/policies/international/finance_en
- https://ec.europa.eu/clima/policies/adaptation/financing_en
- https://ec.europa.eu/clima/policies/adaptation/how/sectors_en#tab-0-0
- https://www.tsb.org.tr/iklim-degisikligi-ve-dogal-afetlerin-sosyal-ve-ekonomik-etkilerinin-azaltilmasi.aspx?pageID=714
- https://ec.europa.eu/clima/policies/adaptation/how/territorial_en
- http://www.europarl.europa.eu/news/en/headlines/society/20180703STO07123/climate-change-in-europe-facts-and-figures
- https://ec.europa.eu/clima/citizens/eu_en
- https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1565713062913&uri=CELEX:52019DC0285
- https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/governance-energy-union/national-energy-climate-plans

ANNEX:

BASIC STEPS FOR A CLIMATE-NEUTRAL EUROPE BY 2050

On 28 November 2018, the European Commission has adopted a long term strategic vision for a prosperous, modern, competitive and climate-neutral economy in Europe until 2050.

In order to put into life the EU decision titled "Long Term Vision for a Climate Neutral Europe by 2050", 3 fundamental steps to be taken were explained in detail, namely 1: Political/ policy process; 2-Transition to climate neutral economy: Sectors, technologies, research and innovation and 3-Socio-economic impact Citizens, workers, enterprises. Questions, responses and evaluations in relation to these three issues are given below in detail:[106]

1. POLITICAL/ POLICY PROCESS

1.1. Why is the Commission presenting a long-term strategy to reduce greenhouse gas emissions?

The 2015 Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) sets the goal to contain the rise in average global temperatures to well below 2°C above pre-industrial levels and to pursue efforts to limit it to 1.5°C. All Parties to the Paris Agreement are invited to submit mid-century strategies by 2020. To prepare for this transformation, the European Parliament and the European Council invited the Commission to come forward with a long-term strategy on the reduction of greenhouse gas emissions for the European Union, in accordance with the Paris Agreement.

The strategy confirms Europe's commitment to lead in global climate action through a socially just transition 2050 Vision of EU will allow for a thorough debate involving European decision-makers, stakeholders and citizens at large to consider how the EU can make a fair contribution to meeting the long-term temperature goals of the Paris Agreement and how this transformation can be achieved.

1.2. How does the long-term strategy relate to current European climate, energy and transport policy and legislation?

EU's climate change long term strategy is not a legal regulation or a part of the acquis. The strategy is not a legislative proposal, but a strategic vision, supported by a detailed analysis, on how the EU can deliver on the Paris Agreement while enhancing the co-benefits of emission reductions and transforming its economy for the 21st century The vision presented today does not propose to change the 2030 climate and energy targets but will enable the EU to build on them and develop in due time policies towards 2050. The Strategy also clearly underlines that a transition towards climate neutrality cannot happen without the mobilisation of important growth-enhancing and supporting policies, such as competition, labor market, skills development, regional cohesion, taxation and other structural policies

[106] https://ec.europa.eu/clima/news/commission-calls-climate-neutral-europe-2050_en (direct quoted).

2. TRANSITION TO A CLIMATE NEUTRAL ECONOMY: SECTORS, TECHNOLOGIES, RESEARCH AND INNOVATION

2.1. Which pathways were considered by the Commission to reduce greenhouse gas emissions?

The Commission looked into pathways to reduce greenhouse gas emissions that are consistent with the current scientific understanding on how to limit global warming to a temperature rise of well below 2°C and 1.5°C, as compiled by the Intergovernmental Panel on Climate Change (IPCC). The Commission assessed pathways for the EU that achieve greenhouse gas emissions reductions between 80% by 2050 (compared to 1990) up to net zero greenhouse emissions by 2050 – all of them are in line with the Paris Agreement.

The Commission's analysis is informed by a detailed modelling of pathways across all sectors of the economy, and including all greenhouse gases. These pathways are "what if-scenarios": they study what would happen with a given combination of technologies and actions. These pathways, therefore, are not predictions about the future. Rather, they are plausible options to achieve a climate neutral Europe. The work also benefited from the existing research literature and an open public consultation that received more than 2800 responses and more than 100 position papers.

2.2. How will the different economic sectors play a role in the climate neutral transition?

All sectors of the economy will have their role to play in the transition towards climate neutrality.

Power Sector: Today, the major part of our energy system, which accounts for more than 75% of the EU's greenhouse gas emissions, is based on fossil fuels. All pathways assessed imply that by mid-century this will change radically. The deployment of renewable energy will drive a large-scale electrification of the energy system, be it at the level of end-users – such as energy use in industry, buildings or transport – or to produce carbon-free fuels and feedstock for industry. The power sector will thus become a central element for the transformation of other economic sectors. All pathways converge on one central element, power generation should be fully decarbonised by 2050. More than 80% of the EU's electricity would be produced by renewable energy sources.

Industry: Most industrial greenhouse gas emissions stem from heating purposes, be it for steam and hot water or high temperature applications. These emissions can be reduced through further efficiency improvements and by switching to low and zero carbon energy sources such as renewables-based electrification, sustainable biomass, synthetic fuels or hydrogen. Around a quarter of industrial emissions consists of process-related emissions (i.e., emissions from chemical reactions other than combustion), which are more difficult to reduce. Cutting these emissions will require genuine process innovation or the application of carbon capture and storage. Innovative industries can also improve their resource efficiency and reduce greenhouse gas emissions by improving re-use and recycling

through circular economy approaches and sector coupling. Significant innovation efforts are needed in the next ten years to deploy the economically competitive technologies needed to contribute to a low-carbon and circular industrial transformation.

Mobility: The transport sector currently relies largely on fossil fuels. Achieving deep emissions reductions will require an integrated system approach. This includes promoting: (i) overall vehicle efficiency, low- and zero emission vehicles and infrastructure; (ii) a long-term switch to alternative and net-zero carbon fuels for transport; (iii) increased efficiency of the transport system – by making the most of digital technologies and smart pricing and further encouraging multi-modal integration and shifts towards more sustainable transport modes. There is no single fuel solution for the future of low-carbon mobility – all main alternative fuel options will be needed, but different options are more suitable for different transport modes. Changes in behaviour and consumer choice to shift from private transportation to low-carbon public transport, shared mobility and zero-carbon mobility (biking, walking) are also key. Rethinking mobility will deliver tangible benefits, including clean air, reduced noise, and more liveable urban spaces, generating major benefits for citizens' health and quality of life and the European economy.

Agriculture: Agriculture will have to continue to provide food, feed and fiber to the EU society and economy, while contributing to efforts to reduce greenhouse gas emissions. Agriculture is the EU's largest source of non-CO_2 greenhouse gas emissions, which are challenging to reduce. As overall greenhouse gas emissions continue to decrease, agriculture is likely to account for a relatively large share of the remaining emissions. However, emissions from agriculture can be reduced through a range of practices and technologies such as improved livestock, fertilizer and manure management. Agricultural practice also influences the carbon stored in our soil. Furthermore, it has an important role to play in producing sustainable biomass for use in the bio-economy and the energy sector.

Buildings: Buildings, combining the residential and services sectors, currently represent the largest share official energy consumption in the EU – about 40% of the total in 2015. Better building insulation and other measures to improve the housing stock on a much higher scale than today will help reduce energy use for heating. This will play a key role in decarbonisation. More efficient products and appliances, deployment of "smart" buildings/appliances management systems and consumer behavior will help to further moderate energy demand. As to the remaining energy needs, fuel switching will need to happen with almost all homes using renewable heating (electricity, district heating (produced from renewable sources), renewable gas and solar thermal). Importantly, biogas, hydrogen (up to some proportion) or e-methane produced from renewable electricity are renewable gaseous fuels that could all play a role in existing buildings without changing the current transmission/distribution grid and type of appliances. 80% of the 2050 buildings' stock exists today. An integrated approach and consistency across all relevant policies will be necessary for the modernization of the built environment and mobilization of all actors. This is a condition sine qua non to engage citizens and businesses in the necessary renovation activities.

2.3. What are the respective roles of technology and consumer choice in the pathways to reduce greenhouse gas emissions?

The Commission has studied eight different pathways. They all include a wide range of technological and organizational options to reduce emissions. Some pathways focus on specific technologies or options, others focus more on demand-side measures, such as promoting energy efficiency or circular economy. Still there will always be some emissions remaining, for instance from agriculture. To achieve net zero greenhouse gas emissions these need to be compensated by increased absorptions in our natural sink (e.g. afforestation or improved soil management) or by deploying negative emission technologies (e.g. the use of bioenergy combined with carbon capture and storage), technologies that are still underdevelopment. The degree of reliance on such technological options will also depend on other options that could be considered: that is why one pathway achieves net zero greenhouse gas emissions with a strong focus on zero carbon fuels as well as the deployment of negative emission technologies. Another pathway achieves net zero greenhouse gas emissions by relying less on these technologies but more on a combination of circular economy approaches, increased actions to enhance the uptake of CO_2 through land use and forestry and further reflecting recent trends regarding consumers' behavior and lifestyles.

2.4. What are the potential synergies between the low-carbon, circular and digital economy transition? Why do we need an integrated approach?

The Commission's vision centres on a European economy that is dynamic, vibrant, and low on greenhouse gas emissions. For this transition, innovation from the digital economy is vital to bring about benefits to competitiveness and decarbonization. The Commission's vision analyses, for instance, the use of digitalization in the transport sector and in power generation. Circular economy aspects are of particular importance for both industry and consumers, as well as for reducing non-CO_2 greenhouse gas emissions from waste. Smarter farming will benefit from increased digitalization. An essential element in that respect is to promote sector coupling, that is, where solutions can be optimized across and not only within sectors. The combined analysis of these transitions allows the Commission to propose a consistent vision for a competitive Europe in the 21st century.

2.5. What is the role of biodiversity and ecosystem services for climate mitigation and adaptation in the strategy?

Terrestrial and marine ecosystems are an essential asset for mitigating climate change. At global level, these natural "carbon sinks" absorb 50% of anthropogenic greenhouse gas emissions, including in particular through the oceans. The remainder is stored in the atmosphere, increasing greenhouse gas concentrations and causing climate change. Maintaining and further increasing the natural sink of forests, agricultural lands and wetlands in the EU is

important. It also helps to compensate any remaining greenhouse gas emissions that cannot be avoided. In this context, preserving and restoring ecosystems and nature-based solutions have a key role to play and provide multiple benefits for mitigating climate change and adapting to its consequences. They provide a set of services that protect us from the impacts of climate change, such as water retention, flood control, air quality improvements and protection against desertification and combat the heat island effect in cities while contributing to climate change mitigation.

2.6. How can research and innovation accelerate the different pathways towards climate neutrality?

A range of existing and novel technologies will be necessary for reaching climate neutrality. These technologies are at different levels of development and deployment. A massive research and innovation effort, built around a coherent strategic research and innovation and investment agenda is needed in the EU within the next two decades to make low and zero-carbon solutions economically viable. Investments are needed in fundamental research (better understanding, new concepts), applied research (bringing concepts from the lab to building prototypes), industrial innovation and deployment (continuously improving technologies and their usage) and socio-economic research and social innovation needed to engage citizens and consumers in the transition to a climate neutral economy. Research, innovation and education form an ecosystem, working together to create sustainable wealth, jobs, growth and social progress.

Europe plays an active role in the global research landscape and European businesses make significant investments in research and development, spurring product, process, organisational and marketing innovation. The EU will encourage developing a strong industrial basis in Europe in support of clean energy transition and support European industry in becoming the global leader in sustainable and resource-efficient business models, products and services that could then become the paradigm across the world. This leadership would provide a competitive advantage, allowing Europe to export not only sustainable products but also sustainable technology and business models.

The EU supports research and innovation for example through major research funding of Horizon Europe (EUR 100 billion proposed for 2021-2027), the Innovation Fund (under the EU Emissions Trading System), the planned InvestEU Fund (2021-2027), the Strategic Energy Technology Plan (a government-industry research platform) and through a proposed EUR 41 billion Smart Specialization Strategy within the European Regional Development Fund programme (2012-2027).

Furthermore, the proposed Horizon Europe includes a EUR 15 billion worth cluster for Energy, Climate and Transport aimed at boosting key technologies and solutions that underpin EU policies in this field. It also includes EUR 10 billion for food and natural resources, including the bio-economy. More efficient food systems, in particular those that reduce food waste, and new bio-economy approaches that turn waste into value and replace fossil fuels through renewable biological resources, can significantly contribute to climate mitigation as highlighted in the updated Bio-economy Strategy and its Action Plan.

3. SOCIO-ECONOMIC IMPACT: CITIZENS, WORKERS, BUSINESSES

3.1. How much will Europe need to invest to complete the necessary transition? What is the EU doing to finance such a transition?

Today, around 2% of the EU's GDP is invested annually in our energy system and related infrastructure. This would have to rise to 2.8% (or around EUR 520-575 billion annually, excluding investments related to the vehicle stock) in order to contribute to a net zero greenhouse gas economy. This is a significant amount, even for a developed economy as the EU but such additional investment can pay off via, for instance, lower energy bills or increased competitiveness.

Overall, the transition is projected to stimulate growth and jobs, with beneficial GDP impacts up to 2% by 2050. Most of the investments needed to put the EU on a climate neutral path will come from individuals or private companies. Public intervention can address the financial constraints preventing sufficient investment flows. The EU is already preparing for this wide-ranging investment challenge:

- The European Fund for Strategic Investments (EFSI), launched in 2015, is unlocking additional investment of at least EUR 315 billion over 3 years, providing a guarantee of EUR 21 billion for business and infrastructure projects. EFSI was extended and now aims to mobilize EUR 500 billion of investment in strategic infrastructure and companies. A large proportion of such investments contribute to a low-carbon resource efficient economy.
- The InvestEU programme brings together a multitude of EU financial instruments to further boost investment, innovation and job creation. The programme is built on the success of (and on lessons learnt from) EFSI. The size of the proposed InvestEU guarantee is EUR 38 billion which is expected to generate EUR 650 billion investments. At least 30% of such funds should contribute to climate action.
- The Commission's Action Plan on Financing Sustainable Growth aims to further connect finance with the needs of the European and global economy for the benefit of the planet and our society. The plan has three objectives: (i) re-orient capital flows towards green investment; (ii)manage financial risks stemming from climate change, natural disasters, environmental degradation and social issues; and (iii) foster transparency and long-termism in financial and economic activity

The EU is spending about 20% (over EUR 260 billion) of its overall budget in 2014-2020 to climate change-related action. The Commission proposed to raise this share to 25% for the period 2021-2027.

3.2. How will the strategy affect workers in carbon-intensive sectors/regions? What are the jobs that a low-carbon economy is expected to create?

The transition to a climate neutral economy drives modernization of the economy and society in Europe. While overall it is expected to have a positive impact on employment, some sectors will see job losses, such as coal mining and fossil fuel extraction. Other sectors will see a shift in how they produce goods, requiring reskilling and upskilling of

the workforce. This will affect some regions more than others, in particular where extractive industries and energy-intensive manufacturing represent are latively high share of total employment. Such a transition will need to be carefully managed, ensuring equity and social fairness from the outset. We must avoid any sector or region becoming blighted by unemployment. Nobody should be left behind - this must be a socially fair transition based on EU solidarity.

To address this, both the EU and its Member States must take into account the social implications of this transformation from the outset and deploy all relevant policies to the fullest to mitigate this challenge. The EU budget already has a considerable focus on employment and cohesion policies, with the aim to reduce social and territorial disparities. For the next long-term EU budget, the Commission has proposed to further strengthen the Union's social dimension with a European Social Fund Plus(ESF+), worth EUR 101.2 billion. A more effective European Globalization Adjustment Fund (EGF), with a total budget of EUR 1.6 billion, will be able to support also workers who were unexpectedly dismissed due to the transition to a low-carbon economy. The Coal and Carbon-Intensive Regions in Transition Initiative is specifically focused on helping regions with coalmining with this transition.

Skills development will be important for keeping our economy competitive and ensuring full participation in the economy and society. It is essential to address the changes that will occur on the job market due to the low carbon transition but also to address other ongoing transformations such as increased digitalization. For instance in the European renewable energy sector, the most wanted job profiles are technicians engineers and researchers. New jobs will emerge in all parts of the value chain, from the manufacturing of renewables equipment, to project development and actual production and operation of renewable energy. This transition will also considerably change the task profiles of architects, construction workers, electro-engineering workers, drivers and vehicle operators, farm workers and gardeners, machine and plant operators, other manufacturing workers, handicraft and printing workers, and production and specialized services managers.

3.3. What would be the implications of the low-carbon transition on urban and rural spaces and the built environment?

With around 75% of EU population living in urban areas, cities and their inhabitants have a crucial role to play in reducing greenhouse gas emissions and adapting to the unavoidable impacts of climate change. Low-carbon urban mobility will improve the quality of life in urban environments in particular by reducing air pollution and noise. City planning, local public transport, safe cycling and walking paths, new delivery technologies, "mobility as a service" such as car and bike sharing services, and alternative working schemes such as teleworking will all alter the ways in which people and goods move from one place to another. Rural areas, faced with growing and changing demand in agricultural and forestry products, will need to maintain a sufficiently skilled workforce to meet these challenges, while being confronted with a decreasing rural population. Agriculture will need to contribute with fiber for the bio-economy and biomass for the production of bioenergy, which would impact land use and diversify agricultural production.

Moving towards smart and energy efficient buildings (in terms of appliances or heating and cooling system needs) will also contribute to empower citizens, increase their quality of life and reduce their

energy bills. To achieve and sustain higher buildings' renovation rates, adequate financial instruments to overcome existing market failures, sufficient workforce with the right skills and affordability for all citizens are of central importance. Consumer engagement, including through consumer associations, will be a key element in this process.

3.4. What can the EU do to assist our society and economy to make this transformation happen?

The EU will continue to ensure that its energy and climate policies but also its research and innovation, investment, industrial policy and social cohesion policies steadily steer towards the decarbonized future. The Commission has also "mainstreamed" climate action, including clean energy transition, in its funding programmes and aligns all other policy areas to support the transformation. However, more can be done in the areas of employment, education and health to support citizens in this process. In research and development, EU programmes (as mentioned in question 8) must support the drive in zero-carbon technology innovation. In stimulating change in the finance industry, the Commission's Action Plan on Financing Sustainable Growth will create the framework necessary to support a movement towards green investment, first in the EU but also globally. Socially, to ensure a fair and inclusive transition, the EU will continue to provide support for the development of new opportunities in regions and communities affected by these transformational challenges.

The risk of energy poverty is and will remain an essential challenge to be addressed. The social consequences of the transition cannot be addressed post factum. Social issues are generally better addressed through the social policy and welfare systems, the financing of which could benefit from tax shifts and revenue recycling. The transition will also require much stronger awareness, empowerment and encouragement of citizens and consumers. Citizens are increasingly concerned about climate change and its consequences, but they need to be equipped to take informed decisions on the impacts of their mobility and consumption choices, how they travel, how they produce and consume energy and how they build and renovate their houses. Better labelling and information on their environmental footprint can help. Socially fair environmental taxation and carbon pricing systems should also play an important role in steering this transition. Moving towards a net zero greenhouse gas economy can only be successful when citizens embrace change and experience it as beneficial for their lives and those of their children.

3.5. What are the positive impacts of the low greenhouse transformation for the citizens and the economy in terms of non-climate co-benefits (air pollution, resource efficiency, energy security, etc)?

The transformation towards a climate neutral economy is not all about future climate change. It is also about us and our daily lives, about the way we work, use transport and live together. Ambitious climate action improves air quality and helps protect biodiversity. Furthermore, Europeanscould benefit from a more innovative, dynamic, competitive and inclusive economy. The EU will also significantly reduce its fossil fuel dependency, making our economy less vulnerable to energy crises.

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