

NEWSLETTER

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CLIMATE TECHNOLOGIES



INTERVIEW

**TÜRKİYE IS WAITING FOR
ITS CLIMATE LEGISLATION**

PROF. DR. HALİL HASAR



INTERVIEW

**CARBON CAPTURE HOLDS THE
KEY TO ACHIEVING NET ZERO
EMISSIONS BY THE YEAR 2050**

BURÇİN TEMEL McKENNA

İKLİM TEKNOLOJİLERİ: TEHDİT VE FIRSATLAR PARADİGMASI

Türk firmalarının küresel rekabetçiliğini artırmak üzere kurulan Türkiye Teknoloji Geliştirme Vakfı, kendisini dünyanın odağına aldığı iklim teknolojileri başlığında konumlandırdı. İklim teknolojileri alanında iki yıldır sektörel analizler ve öncül proje programları yürüten TTGV, özel sektör, kamu ve akademi arenasındaki paydaşlarının da desteği ile Türkiye'nin geleceği için büyük önem taşıyan bu mega değişime yönelik çalışıyor.

Yeşil Mutabakat gibi özellikle sanayiye etkileyecek anlaşmaların getirdiği mecburiyetlerin aşıldığı iklim teknolojilerinin günümüzün en belirleyici ekonomik değişimi haline geldiği bir döneme giriyoruz. Türk sanayisinin kapsamlı bir rekabetçilik tehdit ve fırsat paradigması ile karşı karşıya olduğunu görüyoruz.

Bu çerçevede ülkemizde öncelikle iklim teknolojilerinde somut uygulamalar ile talebin oluşması, pazarın gelişmesi ve küresel zincirlere entegre olabilecek yetkinlikte tedarikçilerin büyümesi gerekiyor. Biliyoruz ki iklim teknolojileri Türkiye'nin katma değerli teknoloji ihracatına katkı sağlamanın yanında, ekonomik ve jeopolitik risklere karşı dayanıklılığını da arttıracaktır.

TTGV olarak, türünün ilk örneği iklim teknolojisi projelerini hayata geçirmek ve pazar oluşumunu tetiklemek yoluyla Türkiye'de iklim teknolojisi sektörünün gelişmesi için öncülük yapmayı sürdüreceğiz.

TTGV İklim Teknolojileri Bülteni ile Türkiye ve dünyadaki iklim teknolojileri gelişmelerini aktarmak ve TTGV'nin öncül çalışmalarından paydaşlarımızı haberdar etmek isteriz.

#TeknolojiÜretenTürkiye için değişimin ezberbozan öncüsü olarak bu teknoloji yarışında bizimle iletişimde olan ve olacak tüm TTGV dostlarımıza teşekkürlerimizle...

DEĞERHAN USLUEL

TTGV Yönetim Kurulu Başkanı



CARBON CAPTURE HOLDS THE KEY TO ACHIEVING NET ZERO EMISSIONS BY THE YEAR 2050



BURÇİN TEMEL McKENNA

Chairperson of the Global Carbon Capture Centre of Excellence

INTERVIEW: Esra YAZDIÇ DEMİR
TTGV Corporate Communications and Media Manager

Carbon capture is the most prominent issue in today's world where the world is trying to apply green transformation mechanisms to sectors. Pointing out that carbon capture is expected to be the pillar of global decarbonisation initiatives and that carbon capture holds the key to achieving net zero emissions by the year 2050, Burçin Temel McKenna, Chairperson of the Global Carbon Capture Centre of Excellence, stated the following and warned: "Given the carbon border adjustment mechanism, any cement, steel or alumina entering Europe will be subject to additional tariffs unless they are carbon neutral. This will have huge implications for heavy industry exporting from the Türkiye to the European market."



We discussed the carbon issue with McKenna in the recent period in which the green transformation is an urgent action plan for all countries.

What is carbon capture technology and why is it important for the planet earth?

There are various carbon capture technologies aimed at separating CO₂ from flue gas sources or directly from the air. Carbon capture is expected to be a key pillar of decarbonisation initiatives globally. According to the Intergovernmental Panel on Climate Change IPCC, after having applied carbon capture to all industrial emitters, it will also be necessary to capture CO₂ directly from the air. Therefore, carbon capture holds the key to achieving net zero emissions by the year 2050. We would like to electrify industrial processes as much as possible, but at the moment we do not have enough renewable electricity sources and it is not possible to electrify all industrial sectors. Under these circumstances, carbon capture plays an important role.

FINANCING THE CARBON MARKET

How do carbon capture technologies progress in the international arena? What are the development, financing and application examples of the technology?

Carbon capture projects especially in Denmark, Norway, Sweden, the UK, Central Europe and the USA have been progressing rapidly. Some of these projects have already taken final investment decisions and more are expected to do so in 2024 and 2025. There is only a short time left for the EPC projects to be launched. The full operationalisation of the ETS of the European Union in 2030 has a significant impact on the acceleration of these projects. There are numerous funding opportunities, both in the form of the EU Innovation Fund and national subsidies. Large subsidies for stored CO₂ in the USA drive the development of the market. Several projects are receiving financing interest from private investors or other investment companies, as these investors intend to sell biogenic green CO₂ credits once the CO₂ is stored.

What are the challenges and opportunities that exist in this area? In particular, how do industry groups of different sectors approach the issue?

The challenges that exist in this area are mostly related to market maturity and the underdevelopment of carbon pipelines and storage wells. Since such projects have not been put in practice for many years, technology providers are reluctant to offer price or performance guarantees. The opportunities are, of course, to be able to offer climate neutral or positive products to the market and to be able to achieve superior prices and high market share. Taking the CBAM - carbon border adjustment mechanism into account, any cement, steel or alumina entering to European market will be subject to an additional tariff unless they are carbon neutral. This will have huge implications for heavy industry exporting from Türkiye to the European market.

INDUSTRIALISTS NEED TO SWITCH TO RENEWABLE FUELS

How should industrialists determine a route in this sense?

It is of great importance for cement producers to reduce their fossil-based carbon footprint, to be in a position to switch to waste fuel sources or biogenic fuel sources, as well as to develop carbon capture projects with storage or utilisation pathways. We expect cement producers to receive high prices for green cement given that their costs do not increase much in infrastructure projects. For steel and alumina producers, it will be crucial to increase recycling rates, so that they can recover scrap materials and switch to renewable fuels (e.g. wind power or solar power). Car manufacturers and white goods manufacturers have already started to demand green steel. Türkiye occupies an important position both in terms of steel production and its utilisation in downstream industries.

Another challenge faced by heavy industry is the lack of CO₂ infrastructure such as pipelines and designed storage areas. Manufacturers cannot embark on these projects without transportation and storage options.



THE SITUATION IN SECTORS WHERE EMISSION REDUCTION IS CHALLENGING

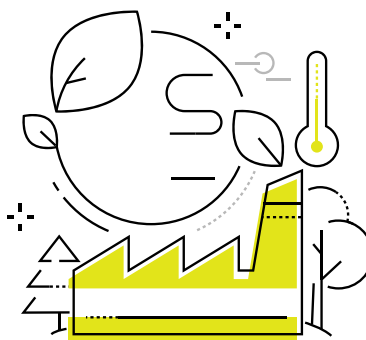
Sectors show a mobility in terms of reducing emissions rather than calculating them. What is the potential for carbon capture, utilisation and storage in areas where it is challenging to reduce greenhouse gas emissions?

For the cement industry in particular, there is no alternative to carbon capture to reduce CO₂ emissions as long as producers intend to continue producing cement. For the steel industry, both CO₂ capture and H₂ are options available, however, the amount of H₂ required to convert a steel plant to DRI also requires its own power plant, making the conversion prohibitively expensive.

EMPHASIS ON THE PARTNERSHIP

Which steps need to be taken to create awareness in the sectors in the carbon process? How should the public and private sector react? What kind of a path is followed in terms of policies abroad?

Options for a transition to a green energy and economy need to be incorporated into national policies. Should this not happen fast enough, it would be important for private companies to start building partnerships with their buyers and product users. Where European buyers need to source their carbon neutral materials from Türkiye, they must also be open to co-developing and co-operating on these projects. It may also be easier to attract the interest of global financial institutions when the end buyer has a long-term or fixed quantity purchase commitment.



Different / interesting initiatives regarding large-scale carbon capture, utilisation and storage exist worldwide, and major competitions are being organised. What do you think about the global 'Carbon Removal' competition with a \$100 million prize, launched by Elon Musk in 2021 in cooperation with the Xprize Foundation?

A number of new technologies in carbon capture are frequently emerging. These are very positive developments, which will ultimately contribute to lower prices in the market in the future. At the moment, however, financially sound projects are the ones that utilise technologies that have already been proven on an industrial scale.



OBLIGATIONS AND LEGAL PROCESSES IN CLIMATE CHANGE



DR. BURAK BAYKAL

Technical Team Leader of
TTGV Pioneer Project Program

It was only at the end of the 19th century that scientists began to study the effects of climate change and global warming, but for many years the damage caused to our world by increasing concentrations of greenhouse gases in the atmosphere had not been taken into account. In 1979, at the first World Climate Conference, climate change was recognised for the first time in history by the international community as a global threat and it was acknowledged that a lasting solution could only be achieved through intergovernmental cooperation. However, constructive steps towards a solution could not be taken until the “United Nations Framework Convention on Climate Change (UNFCCC)”, which entered into force in 1994, and the process progressed very slowly. Following the Kyoto Protocol, to which Türkiye became a party in 2009, and the Paris Climate Agreement, which regulates the post-2020 climate regime, countries have started to make commitments for the first time in the combat against climate change by imposing some targets for themselves. While these commitments which were made before the eyes of the whole world were unfortunately not binding, they have at least redefined the standards of international trade and triggered the formation of new policies, incentive packages, legal arrangements and regulations that nations would adopt in order to achieve their goals of combating the climate change. Many of the developed

countries, especially those with intensive industrial production and responsible for the majority of global carbon emissions, have taken measures against this global threat by updating their national laws and policies. These measures ranged from commitments to strict emission reductions to switching to renewable energy sources, improving energy efficiency and promoting sustainable development.

EXAMPLES FROM COUNTRIES

For instance, Germany has adopted the “Climate Action Plan”, which aims to neutralise greenhouse gas emissions by the year 2045. In 2021, Germany adopted the “Energy Transition” plan, through which Germany set emission reduction targets in the energy, industry, transportation and construction sectors and committed to increase the use of renewable energy sources. Similarly, in 2014, France adopted the “Energy Transition” draft legislation and announced that the country aims to increase the share of renewable energy in the energy mix to 32% by 2030. Efforts towards achieving all these targets are being made based on the European Union’s (EU) “EU Green Deal” document, which is a growth strategy and large-scale policy package that supports the achievement of the European Union’s (EU) objective of becoming the world’s first climate-neutral region by 2050. Created in 2019, this strategy was followed by the “Fit for 55” legislative change package published in 2021, through which the European Union declared its objective to reduce its emissions by 55% (compared to 1990) by 2030. The “Border Carbon Adjustment Mechanism” (CBAM), which perhaps constitutes one of the most important parts of this package, directly affects international trade. This practice, which entered into force in October 2023, has been accepted as a transitional period until January 1, 2026 and requires the reporting of carbon emissions emitted during the production of different products imported into the European Union, such as iron and steel, cement, aluminium, fertiliser, electricity and hydrogen products, as well as (indirect) emissions from the production of electricity used in production processes. As of 1 January 2026, when the actual implementation will start, carbon taxes calculated based on weekly carbon prices in the EU Emissions Trading System (ETS) will be payable for emissions embedded in imported products, and indirect emissions in the cement and fertiliser sectors will also be subject to this tariff. All these legal arrangements also demonstrate the extent of the economic transformation to be experienced

in the European Union and all countries with which it has commercial relations within the framework of the European Green Deal.

The United States of America (USA) and China, the two largest economies in the world and the two countries that produce the highest carbon emissions, endeavour to demonstrate that they are taking responsibility in the international arena through their national policy amendments and new legal regulations, even though they are not progressing as confidently as the EU. So much so that these two countries, which are mostly known for the harsh political relations between them, concluded an agreement for the first time at the United Nations Climate Change Conference (COP26) held in Glasgow, Scotland in 2021 to accelerate cooperation in the combat against climate change. The perspective of both countries on the issue and the reflections of their commitments in the international arena on their domestic policies have been diverse. Especially in the aftermath of the COVID-19 pandemic, as a result of the global rise in inflation and the gradual increase in energy costs, the United States has implemented various policies aimed at reducing carbon emissions and increasing renewable energy resources. For instance, “The Inflation Reduction Act of 2022” signed by US President Joe Biden on August 16, 2022 constitutes the most comprehensive of these policy outcomes. Within the scope of the regulation, which is regarded as the largest “climate package” in the US history, it is aimed to reduce carbon emissions by 40% by 2030, invest in clean energy through large-scale infrastructure and climate technology projects, and render the electricity sector completely decarbonised by 2035. Furthermore, thanks to these legal arrangements, the advantages such as subsidies in the range of 600-800 million dollars to the factories within the borders of the United States and the ability to produce with cheaper energy prices have also enabled new industrial investments to shift to the United States of America. Within the scope of the “Carbon Neutral Objective”, China aims to reduce the utilisation of coal and increase the renewable energy capacity to a great extent in order to reach carbon neutral values by 2060. In line with this target, China has established the largest national carbon market of the world and intends to reduce carbon emissions, especially in the coal-dependent electric power sector. Similarly, countries such as Canada and India have been among the nations that have determined their national road maps in combating the crisis through their own climate policies

and legislative arrangements. In line with the 2053 net zero emission and green development targets, Türkiye published the “2011-2023 National Climate Change Action Plan” in 2012. Subsequently, in 2021, after a long negotiation process, both the Paris Climate Agreement was ratified and the “Directorate of Climate Change” was established within the Ministry of Environment, Urbanisation and Climate Change. Additionally, various

incentives such as “Electricity Market Renewable Energy Resources Support Mechanism (YEKDEM)” have been implemented in order to increase the utilisation of renewable energy resources and improve energy efficiency. Investments in renewable energy sources such as wind, solar and geothermal are incentivised in this manner and energy efficiency projects are supported.

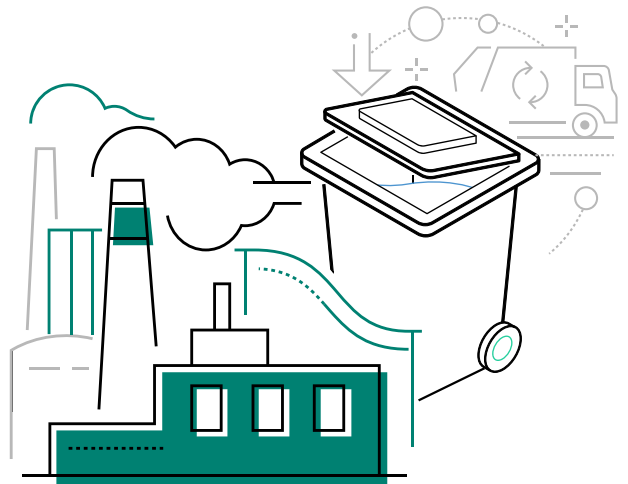
ACTIONS TO BE TAKEN FOR THE PROCESS

Lastly, the 28th Conference of the Parties (COP28) to the United Nations Framework Convention on Climate Change was held in Dubai, United Arab Emirates, between November 30 and December 12, 2023 this year, and Türkiye had a record number of participants in the conference. Although 198 countries that are parties to this framework agreement have agreed on a common statement calling for a shift away from fossil fuels, the rhetoric and commitments contained therein need to be reflected in real actions. According to the announced data, our global carbon emissions continue to increase rapidly every year. All the improvements and actions taken at the present time only allow some of the negative impacts of the climate crisis (global temperature increase) to slow down a little. Nevertheless, this slowdown does not have as great an impact as expected, as the limit of 2 degrees Celsius targeted in the Paris Climate Agreement has already been exceeded. No matter how much the shift towards renewable energy sources increases worldwide, unless global production and consumption processes are balanced, it will not be possible to alter approximately 45% of global emissions by any means. Therefore, the transition from the traditional “Linear Economy” model, which represents the main source of emissions and follows the “produce-consume-dispose” plan, to the “Circular Economy” model needs to be accelerated as much as possible. Within this context, it can be easily stated that increasing policies that will encourage companies to develop products with

low carbon footprint and adopting new mechanisms that will directly affect the producers through their demands by raising the awareness of consumers will become even more important in the coming years in the combat against the climate crisis.



“No matter how much the shift towards renewable energy sources increases worldwide, unless global production and consumption processes are balanced, it will not be possible to alter approximately 45% of global emissions by any means.”



OPPORTUNITIES AND POTENTIALS OFFERED BY CLIMATE TECHNOLOGIES



BUSE HIDIROĞLU

TTGV Climate Lab Community Program Specialist



We witness that climate change, which is one of the biggest problems of today, results in social, economic and environmental problems. While scientists predict that the acceleration in climate change caused by human-induced activities in the last 2000 years will increase even faster than expected in the next 10 years, all studies conducted on the subject reveal that measures must be taken urgently by all individuals and institutions.

While finalising the measures to be taken for climate change, which is emphasised everywhere that it constitutes a global crisis, through technological solutions is one of the most important issues addressed, the active use of technology within the scope of combating the process brings along important opportunities. Two strategies stand out in the processes where climate change policies are determined and road maps are planned. These strategies are: reducing greenhouse gas emissions and increasing adaptation to the effects of climate change.

CLIMATE TECHNOLOGIES OPPORTUNITY

Climate technologies, in particular, will open up important opportunities for combating climate change and building a sustainable future. These technologies serve to reduce or prevent the causes of climate change, increase adaptation and/or resilience to its impacts, and support the management of its consequences. These technologies, which can be considered in a wide range, can be considered as tools for reducing greenhouse gas emissions, increasing energy efficiency, expanding the utilisation of renewable energy sources and enabling adaptation to the effects of climate change.

For instance, carbon capture, utilisation and storage technologies (CCUS), which enable long-term storage and utilisation of carbon by capturing CO₂ in the atmosphere or from emissionsources, will become indispensable in the years to come. Thus, steps to prevent



climate change will be accelerated by the use of a technology that will contribute to the reduction of greenhouse gas emissions. Meanwhile, the development of renewable energy sources through the efficient utilisation of natural resources such as solar and wind will enable clean and sustainable energy production by reducing dependence on fossil fuels. The introduction of next generation technologies to increase energy efficiency in industrial processes, the transportation sector and buildings, and the use of smart grid and storage technologies to integrate energy storage solutions will help reducing the carbon footprint. The utilisation of green hydrogen, which will be introduced in many sectors, will also become possible as a clean energy source. Besides, technologies such as digital agriculture applications for sustainable agriculture, smart agriculture technologies, agricultural waste utilisation technologies for the improvement of food systems, technologies that extend the shelf life of food, and alternative protein technologies are among the important issues that have been discussed.



THE IMPORTANCE OF DATA

Considering all these aspects, the utilisation of digital technologies and big data is of utmost importance in the combat against climate change. Making use of technologies such as artificial intelligence and IoT for the active use of data collection, analysis and prediction systems will enable the improvement of processes in many sectors and the efficient utilisation of all resources. It must be underlined that these technologies need to be embraced and supported by all policy makers, sectors and the society at large in order to be successfully implemented.

WHY IS A CLIMATE TECHNOLOGY RADAR NEEDED?



ESRA BORAN
TTGV Climate Lab Community
Program Specialist

As the effects of climate change on the planet earth have been increasing with each passing day, climate technologies are becoming more and more important in the adaptation of countries to climate change at national and international scale. Qualified data and information that serve to mitigate or prevent the causes of climate change, increase resilience, and support both humanity and nature are needed to steer the green transformation in the right direction.

It is precisely for this reason that the Technology Development Foundation of Turkey (TTGV), which has turned its route to climate technologies, has undertaken the task of acting as a guide under the responsibility of being a Foundation to identify the technologies required for our country to be a pioneer in international competitiveness within the scope of combating climate change and to create categories. The Climate Technologies Radar, which was designed under the framework of the Climate Lab Public Programme within TTGV, has been prepared as a data-driven taxonomy report that will guide the sectors to determine the technologies that can create an opportunity area both for the world and Türkiye.

FIVE THEMATIC AREAS

We aim to provide contribution to all sector actors aiming to reach the 2053 net zero target and creating their road map within this framework through the radar study that sheds light on the fields of action of all sectors regarding the mitigation/prevention of the drivers of climate change, adaptation and resilience processes and managing the consequences of change, which focuses on climate technologies.

Türkiye is located in the Mediterranean Basin, situated in a critical geopolitical area against climate change. Considering different indicators such as the decrease in water resources and abnormal weather events, it can be seen with the data that action needs to be taken for rapid adaptation and transformation.

For Türkiye, which has committed to the carbon neutrality objective in its “Updated First National Contribution Declaration”, acceleration of the green transformation process, particularly in carbon-intensive industries, emerges as an important requirement in the transition to green transformation.

The increase in wastes and air pollution, which progress in direct proportion to the increase in basic needs such as energy and food as a result of processes such as population growth, rapid urbanisation and migration, prove that a radical change is required for the transition to a low-carbon economy.

In this regard, while addressing environmental problems, it constitutes a great opportunity for our country to increase its export potential and accelerate the increase in the level of welfare in order to maintain its competitiveness in transformation and to see that technological solutions need to be utilised in the most accurate manner. Within the scope of TTGV “Climate Technologies Radar”, which categorises climate technologies by analysing this process and presents them to the representatives of the field, and which is a document that will guide the sectors that have the highest impact on climate change, “Industry, Energy, Mobility, Agriculture/Food/Forestry and Built Environment” have been identified as the thematic areas.

PROMINENT TECHNOLOGIES

The decarbonisation road maps demonstrate that while the utilisation of alternative fuels and raw materials has come to the forefront in the sectors, it has become necessary to switch to fuels such as hydrogen and biomass in order to prevent fossil fuel dependency.

It has been determined that the reduction in GHG emissions from transportation will depend on the rapid electrification of road vehicles, operational and technical energy efficiency measures, commercialisation and dissemination of low emission fuels, especially in the maritime and aviation sub-sectors, and policies to encourage the transition to low emission fuels, while the clean production capacity of Türkiye in the area of renewable energy, especially solar energy and wind energy, has been increasing rapidly.

Observation of important parameters such as soil health and protection of water quality in agriculture/food/forest areas has been



TTGV Climate Technologies Radar is available here.

highlighted to meet the increasing nutritional needs of the world population, which is expected to reach 10 billion by 2050. In this field, technologies to prevent waste and losses such as greenhouse gas reduction technologies, alternative proteins, integration of digital technologies with agricultural practices and long-term packaging technologies in food have started to be studied.

Regarding the built environment, while research on reducing embedded emissions as a result of activities such as heating, cooling and lighting of existing buildings stands out, the importance of advanced building materials and efficient energy system technologies in achieving the zero carbon target of existing buildings has been studied.

As the community, we hope that this study, which focuses on current climate technologies, will become an important resource in the development of related sectors.

TÜRKİYE IS WAITING FOR ITS CLIMATE LEGISLATION



PROF. DR. HALİL HASAR
Climate Change President of
Directorate of Climate Change

INTERVIEW Esra YAZDIÇ DEMİR
TTGV Corporate Communications and
Media Manager

Türkiye is determining its strategy for climate change, which stands at the top of the world's most important agenda items, taking into account its geopolitical position. In this sense, the Republic of Türkiye, Ministry of Environment, Urbanisation and Climate Change, Presidency of Climate Change categorises the steps to be taken according to sectors and draws attention to opportunities as well as legal obligations. Stating that the Climate Law, which is of great importance for Türkiye, is expected to be adopted by the Parliament in 2024, Prof. Dr. Halil Hasar, President of Climate Change, emphasised that the course of Türkiye will become clearer after this process.

Highlighting that they have accelerated the preparations for the 2053 Long Term Climate Strategy, Climate Finance Strategy and National Green Taxonomy reports, Prof. Dr. Hasar answered our questions about the importance of climate technologies and the policies to be adopted by Türkiye.

You can find the video of our interview with Prof. Dr HALİL HASAR here.



CLIMATE FINANCE STRATEGY IS BEING PREPARED

With the increasing effects of climate change on daily life, countries have started to reorganise their policies. Each country carries out its planning according to its geographical location. The Presidency was established in line with sensitivities of Türkiye on this issue. What kind of a route did Türkiye set for itself in this process?

Having become a party to the Paris Agreement and following the announcement of Türkiye's 2053 Net Zero Emission Target by our Honourable President Recep Tayyip Erdoğan, accelerating our activities in the field of climate has emerged as an essential issue in terms of both economic and environmental priorities. In this context, we have prepared the Updated First National Contribution Statement and increased our emission reduction target, which we announced as 21% in 2015, to 41% for 2030.

Furthermore, we have prepared the Climate Change Mitigation Strategy and Action Plan covering the years 2024-2030 and covering 7 main mitigation sectors in order for Türkiye to reach its 2030 targets. In this document, we have addressed areas that are important in the process such as carbon markets and just transition as well as energy, transportation, industry, buildings, waste, agriculture and Land Use Change and Forestry (LULUCF).

Türkiye is ranked among the risk group countries in terms of the potential impacts of global climate change. Within this scope, we have prepared the 'Climate Change Adaptation Strategy and Action Plan' covering the years 2024-2030 in order to make our country, economy and cities more resilient. Within the scope of the plan, we have addressed the combat against climate change in 11 sectors (city, water resources, agriculture, ecosystem, health, energy, tourism, industry, transportation, disaster and social development) with our stakeholder institutions within the framework of adaptation and have determined our 2030 road map in detail.

Within the scope of efforts to increase the financing required for the identified climate activities and to enable financial resources to meet with green investments, we have initiated the preparations for the Climate Finance Strategy. Furthermore, the preparations for the National Green Taxonomy legislation, which specifies the qualities that an environmentally sustainable economic activity must have, takes into account the climate change and environmental priorities of investments or facilities, and respects the conditions specific to our country, are continuing at full speed.

Our efforts on the carbon border adjustment within the scope of the activities related to the European Green Deal have been continuing at a rapid pace. As it is known, a carbon tax is being prepared to be imposed at the border on products imported from countries that do not apply carbon pricing. Türkiye made approximately 42 percent of its exports to the European Union in 2020. In this regard, we are also working on the establishment of the Emission Trading System. Following the establishment of the system, we will have the opportunity to support green investments with the income generated by its operation.

Finally, we have started the preparation of our 2053 Long Term Climate Strategy, which will include both mitigation and adaptation chapters, and we aim to finalise and announce it in the very near future. This document will serve as the most important road map for Türkiye in the upcoming period. In this respect, the goal of our country for 2053 is to achieve a Türkiye with a fully resilient society against the effects of climate change and net zero emissions. In line with this goal, we continue to work effectively with all our stakeholders.

WE EXPECT THE CLIMATE LAW TO BE ADOPTED THIS YEAR

You aim for the Climate Law to be the locomotive force to achieve the 2053 Net Zero Emission goal. What kind of value will the Climate Law add to the sectors and our



What does the Proposed Climate Law contain?

The responsibilities and obligations of public institutions and real and legal persons are defined.

Efforts towards achieving the net zero emission target are being made to set targets for the reduction of greenhouse gas emissions and adaptation to climate change without any threatening limitations.

The law enables the implementation of climate change action plans especially in provinces in accordance with the principle of decentralisation.

Decisions aimed at increasing the utilisation of renewable energy and clean technologies in line with the zero waste and circular economy approach draw the attention.

The law includes the regulations related to the Emission Trading System (ETS), which is an emission reduction tool and will be introduced to our country.

Through this law, the legal basis for climate finance, climate change incentives and national green taxonomy studies have been established to identify green investments.

country?

Climate change has been increasingly affecting the whole world and our country as a global threat. This situation changes the habits and priorities of countries in economic and social terms. As in the whole world, transition to a low carbon economy, ensuring green transformation in all sectors that cause greenhouse gas emissions and increasing the capacity to combat and adapt to climate change are also important for Türkiye.

The Climate Law is expected to enter into force this year in order to put all these arguments for combating climate change on a legal basis. Through the Proposed Climate Law, it is aimed to establish the legal infrastructure for greenhouse gas emission reduction and climate change adaptation activities, as well as the planning and implementation tools related to these activities.

THE GREEN DEVELOPMENT REVOLUTION

Green transformation also stipulates some legal regulations. This process, which we characterise as a long-term and difficult transformation, will actually bring many opportunities. How would you evaluate this comment?

Green transformation is a transformation process that aims to increase social welfare by balancing economic, social and environmental aspects. This process covers all areas from industry to agriculture, energy to urbanisation, transportation to water management. For transformation, it is extremely important to provide the necessary finance and technology and to train the necessary labour force.

Moreover, within the scope of adaptation to climate change, climate change and green transformation elements must also be taken into consideration in planning and decision-making processes in reconstruction or urban transformation phases after the 2023 earthquake that caused major destruction in Türkiye.

The green development revolution, which has been announced in line with the net zero emission target, points out to us the upper framework for green transformation. It has demonstrated not only that net zero emission can be



achieved by utilising opportunities such as new markets, sectors and employment areas created by the process, but also that it is possible to transition to a high value-added production structure of the sector and to comply with the green consensus. These can be listed as new employment areas, new sectors and markets, new products, technological transformation, increased access to finance, and improved quality of environment and human life.

STRUCTURING IN ACCORDANCE WITH THE GEOPOLITICAL POSITION

One of the most effective ways to prepare for climate change is to design and deploy technologies in this field. As TTGV, we have shifted our focus to the field of climate technologies in the period of the last one and a half years. In which areas do you think Türkiye needs to improve itself first in climate technologies?

Since there is no single technological solution and transition pathway suitable for every country and situation, all technologies need to be prioritised on the basis of their sociopolitical and institutional compatibility. In this context, an important starting point would be to identify the most appropriate climate technologies specific to the own situation of the country. Under the United Nations Climate Convention, countries report their climate technology needs. In this context, examining the climate technology priorities of developing countries, the energy sector is the sector that prioritises the reduction of greenhouse gas emissions, while the agriculture and water sectors are the sectors where the most action is needed in terms of adaptation to climate change. In Türkiye, energy-related emissions have the largest share in total greenhouse gas emissions. Furthermore, considering the external dependence of Türkiye in the energy sector, high energy imports and geopolitical risks on energy routes, the energy sector stands out as the leading actor in the emission reduction objective. Legislative infrastructure and economic support plans indicate that the focus is on this sector. Regarding adaptation, the importance given to water management, food security and biodiversity can also be seen in the Climate Change Action Plan.

“Through the Proposed Climate Law, it is aimed to establish the legal infrastructure of greenhouse gas emission reduction and climate change adaptation activities, as well as the planning and implementation tools related to these activities.”



26 Trillion Dollars of Economic Benefit

According to the United Nations' inclusive growth report, compared to the current situation, a climate-smart growth strategy will generate at least 26 trillion dollars of economic benefits by the year 2030. Additional employment will be created thanks to new business areas opened by green transformation. The global expectation is an additional 65 million jobs to be created by 2030.

INTERVIEW

Developments experienced in the world of technology, especially artificial intelligence in recent years, are of great importance in terms of combating climate change. In particular, artificial intelligence and digital technologies play an important role in helping to optimise business processes and to utilise energy and natural resources more efficiently, thereby reducing greenhouse gas emissions and other wastes.

For instance, digitalisation is helping to integrate variable renewables into grids to better meet energy demand when the sun shines and the wind blows. Each element of carbon capture and storage (CCS), the ability to reduce CO₂ emissions from power and industry, benefits significantly from advances in digital technologies. Climate technologies are also widely used in many other sectors such as industry, transportation, buildings and agriculture.

SECTORS HAVE TO UNDERGO TRANSFORMATION

Various sectors such as energy, building-construction, mobility, agriculture-food-forestry, and industry have to undergo transformation in the processes of mitigating the impacts of climate change, adaptation and resilience. What are your recommendations?

Each sector has to undergo various transformations to be able to cope with the impacts of climate change and to achieve sustainability and resilience goals. In the field of energy, increasing the utilisation of renewable energy, transition to clean energy sources such as solar, wind, hydrogen instead of fossil fuels, development of energy storage technologies, effective storage and availability of variable resources such as solar and wind energy, smart energy networks and energy efficiency solutions, the use of smart technologies to optimise electricity use and reduce energy waste need to be ensured.

In the field of *Building and Construction*, green buildings, use of environmentally friendly materials, energy efficient design and sustainable construction applications, energy enabled buildings, smart building systems, capabilities to monitor and regulate energy consumption, climate friendly infrastructure, projects that reduce flood risk, improve water management and increase resilience must be put into practice.



In the area of *Mobility*, the focus needs to be on electrification of transportation, transition from petrol and diesel vehicles to electric vehicles, development of charging infrastructure, changes in transportation planning, transformations in urban planning to promote public transportation, cycling and pedestrian mobility, intelligent transportation systems, traffic management and technological solutions to improve road safety.

In the area of *Agriculture-Food-Forest*, adoption of environmentally friendly practices such as sustainable agricultural practices, water management, organic farming and nitrogen management must be enabled, solutions for the minimisation of food waste and minimisation of food waste at the production, storage and consumption stages must be developed, and forest



“Each sector has to undergo various transformations to be able to cope with the impacts of climate change and to achieve sustainability and resilience goals.”

How would you evaluate TTGV's position in this process?

All foundations and NGOs working in the field of climate change and technology, especially TTGV, have important roles to play. As a foundation that follows global developments in the fields of technology and innovation, inspire people, provides vision, improves by learning together, teaches and implements, we know that as of 2023, your focus will be on Climate Technologies. In this field, your Foundation is working to increase capacity in Türkiye through Climate Technologies Pioneer Project, Climate Lab Community, Eco-Production Transformation Programmes, and to contribute to the development of the sector, production and supply chain formation by paving the way for new technologies. TTGV pioneers the development of the climate technology sector in Türkiye by launching climate technology projects and triggering market formation.

I would like to emphasise that green transformation in industry does not only consist of installing renewable energy sources for our industrialists. Emissions are reduced by developing, installing and operating clean production technologies instead of conventional units or stages that emit high carbon emissions, especially in production processes. For this reason, technology-oriented actors such as you have a great deal of work and responsibility in ensuring that the R&D activities to be carried out in Türkiye are oriented towards emission reduction in production, that the studies are aimed at full-scale process design, and that we become a country that sells technology to the world market in this sense.

management and afforestation must be implemented for the protection of forest areas, erosion control and carbon storage.

In the field of *Industrial Production*, cleaner production technologies, technological transformations that reduce carbon emissions and increase energy efficiency in industrial processes, recycling and circular economy, adoption of circular economy principles for more efficient use of raw materials and waste reduction must be ensured, and the use of digitalisation, artificial intelligence and digital technologies must be increased to optimise production processes, increase energy efficiency and reduce carbon footprint.



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