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Issue No: 2
January-March 2021

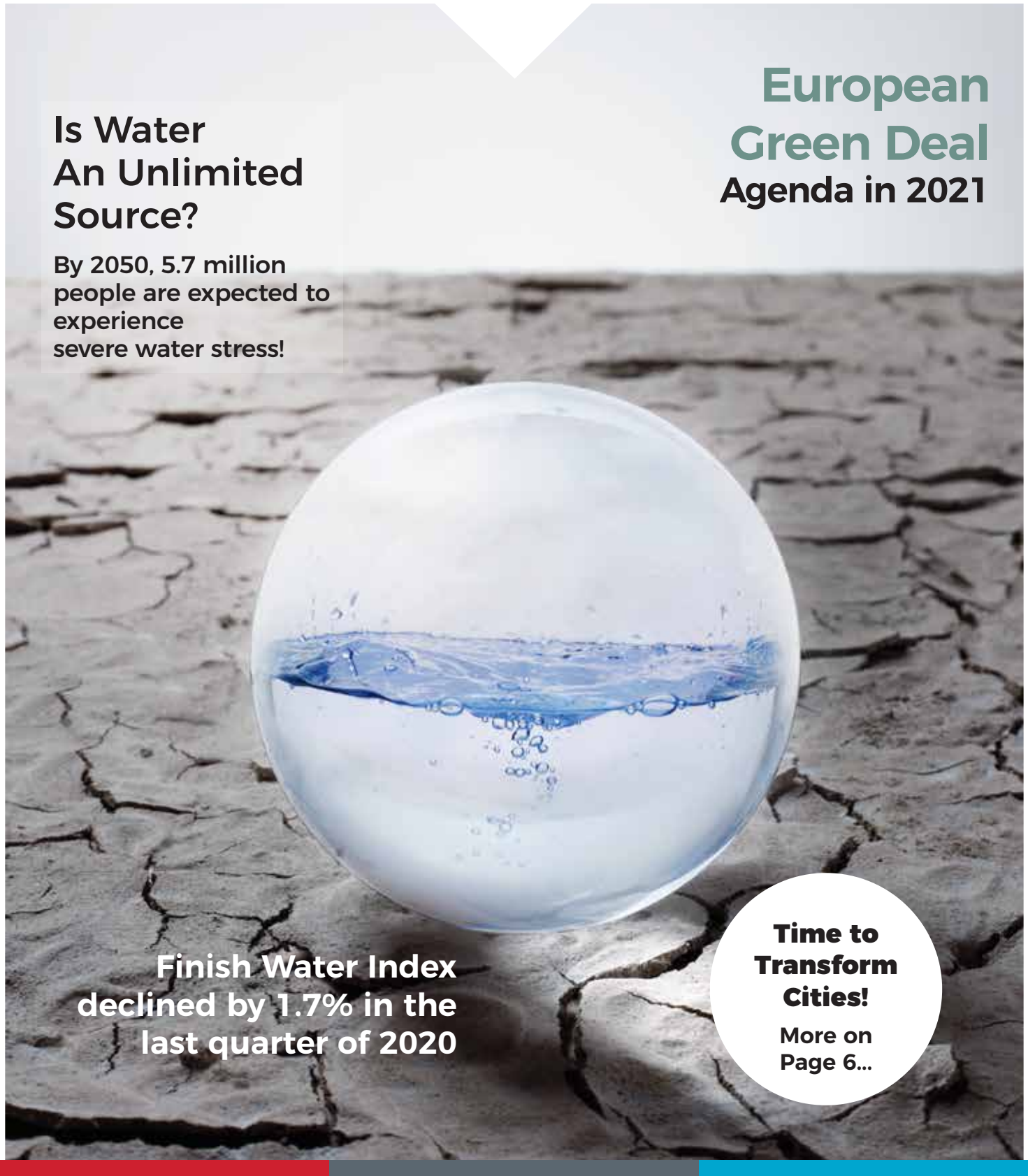
CLIMATE REVIEW

TSKB
Economic Research
GREEN SWAN PLATFORM
A TSKB INITIATIVE

Is Water An Unlimited Source?

By 2050, 5.7 million people are expected to experience severe water stress!

European Green Deal Agenda in 2021



Finish Water Index declined by 1.7% in the last quarter of 2020

Time to Transform Cities!

More on Page 6...

Water is the Next Diamond

Burcu Ünüvar
Head of TSKB Economic Research

unuvarb@tskb.com.tr

Hello from the Second Issue of Climate Review.

We are happy to deliver the second issue of the Climate Review, prepared by TSKB Economic Research!

Although it may just be a report at first glance, the Climate Review means more to us. With our commitment to development banking, this report represents an invitation to our stakeholders to come together around the climate risk awareness.

In this quarter's issue, we invite you to turn your attention about a topic which has recently gained greater pertinence - water. In other words, we would highlight the following:

- *Economic and social development*
- *Health*
- *Growing food*
- *Generating energy*
- *Creating jobs*
- *The rights of poor girls to education*
- *Turning cities into healthy places to live in*

These subtitles are from a report prepared by the World Bank, illustrating the need to think very broadly when discussing water.[1] Touching every aspect of development, the World Bank notes that water is linked to nearly every Sustainable Development Goal. As a vital factor in production, water related losses in agriculture, health, income and prosperity could cause declines of up to 6% of GDP in some parts of the world by 2050. According to figures published by the World Bank:

- *9 out of 10 natural disasters are water-related*
- *2.2 billion people in the world do not have access to safe drinking water*
- *3 billion people lack hand washing systems*

In view of these numbers, it is obvious that the theme of water should not be boiled down to a simple ratio of how full a reservoir is – there is far more to it than that. The discussions should adopt a medium-term development perspective prioritizing a credible water management approach.

In line with this perspective, TSKB Economic Research released a report back in February 2019 with the title "Water is the Next Diamond".[2] Highlighting the value paradox in the economy, the report underlined the vital role of water in our lives, in contrast to the low relative value attributed to it. We have been seeing more and more people quoting this title as awareness about water has continued to grow. However, this is not enough. Awareness should not be something which is turned on and off depending upon how full the reservoirs are. We should insist on building credible water management systems even where there is no water stress on the horizon. So please join us in trying to do the right thing for the right reasons.

Burcu ÜNÜVAR

[1] *https://www.worldbank.org/en/topic/water/overview*

[2] *https://www.tskb.com.tr/i/assets/document/pdf/TSKBBAkis_SUYeniElmas_Subat2019.pdf*

Upcoming Events

The 15th International Climate Change and Global Warming Conference will be held in London on January 21-22

The 15th International Environment and Climate Change Conference will be held in Tokyo on February 19-22

Is water an unlimited resource?

Feridun Tur
TSKB Economic Research

turf@tskb.com.tr

Adam Smith underlined the difference between the value in use and value in exchange, and used the example of water, our vital resource, and diamonds to clarify the differentiation. The market price, as the indicator of value in exchange, is far lower than the value in the use of water, which Smith pointed out as the diamond-water paradox. However, after about 250 years, things are no longer going to be the same. The first study on water within the body of TSKB Economic Research was published in early 2019 under the signature of Can Hakyemez, with the title of "Water is the Next Diamond" in reference to the paradox pointed out by Smith.

In the current era, water is consumed more quickly than it is replenished. Changing dietary habits and increasing consumption on the back of rising income in the world are directly and indirectly resulting in increased water consumption per person. With the impact of population growth in this mix, the increase in water use appears unsustainable. By 2050, the number of people expected to be suffering from severe water stress for at least one month of the year is expected to rise to between 4.8 billion and 5.7 billion.[1]

As a reflection of the climate crisis, changes such as more frequent periods of drought and disproportionate intensity and distribution of precipitation render it difficult for water to replenish itself. While heavy rain depletes usable water, the reservoirs we seek to store rainfall in dry up. Technological advancements allow us to access groundwater at a lower cost, but our rate of drawing groundwater exceeds the rate which the reservoirs fill up. For this reason, the underground water reserves which form over very long time spans are being depleted, and sinkholes are forming.

Management of water supply is a relevant policy area both in the world and in Turkey. Water is a scarce resource, for which we have to take action before it is too late and it runs out. It is crucial to accept this first of all.

We hope we can always remember that water is not an unlimited resource.

[1]UNESCO; The United Nations world water development report 2018: nature-based solutions for water; facts and figures (2018).

Are We Aware of the Importance of Water?

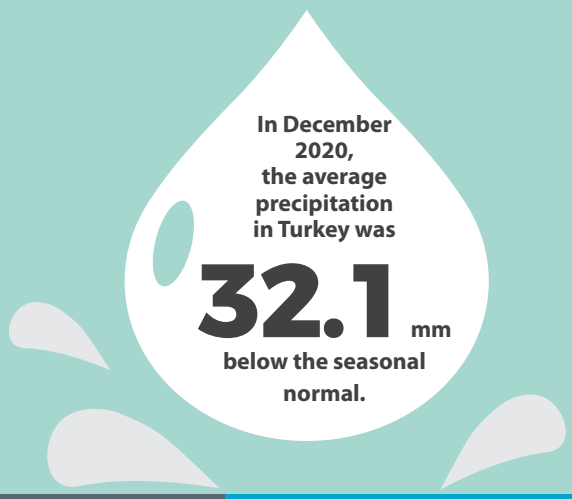
A Different Perspective on Water with the Finish Water Index

Water resources are not infinite. In order to bring up finite water resources and increase awareness of efficient water use among society, the TSKB Economic Research team devised an index methodology to quantify Turkey's current water outlook. As part of our strategic advisory for the Finish Water Awareness Project, we calculate the Finish Water Index (FWI) and update the index on a weekly basis. You may follow FWI on www.yarininsuyu.com.

The FWI is calculated on a weekly basis as a share of total agriculture, industry and household water consumption in renewable water potential. The index takes values between 70 and 130. Where it is below 100, the index indicates the necessity for a more careful and planned consideration of water management.

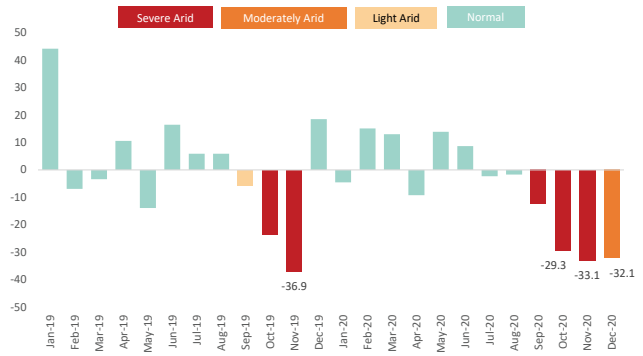
The index results for various time periods could be summarized as follows: the FWI decreased to 84.94 by the end of the last week of 2020, indicating a decline of 1.5%. The average FWI in December 2020 reached 84.92, which is 1.5% below last year's value, but reached 84.87 in the October-December 2020 period, marking a decrease of 1.7% compared to the same period of the previous year.

FWI Value	2020	2019	Change
Last Week	84.94	86.21	-1.5%
Aralık ayı December average	84.92	86.22	-1.5%
October-December	84.87	86.34	-1.7%



According to monthly precipitation data issued by the General Directorate of Meteorology (MGM), the average rate of precipitation in Turkey in the last quarter of 2020 was realized as 101.1 millimeters, being 34.2% lower than in the same period of the previous year, and 43.8% lower than the normal seasonal levels (calculated as the average of the 1981-2010 period). While there was a negative deviation from the seasonal normal every month in the second half of 2020, the months of September, October and November were evaluated as "Severe Arid" and December as "Moderate Arid", according to the Percentage of Normal Method (PNI).

Deviation of Monthly Precipitation from Normal (mm)

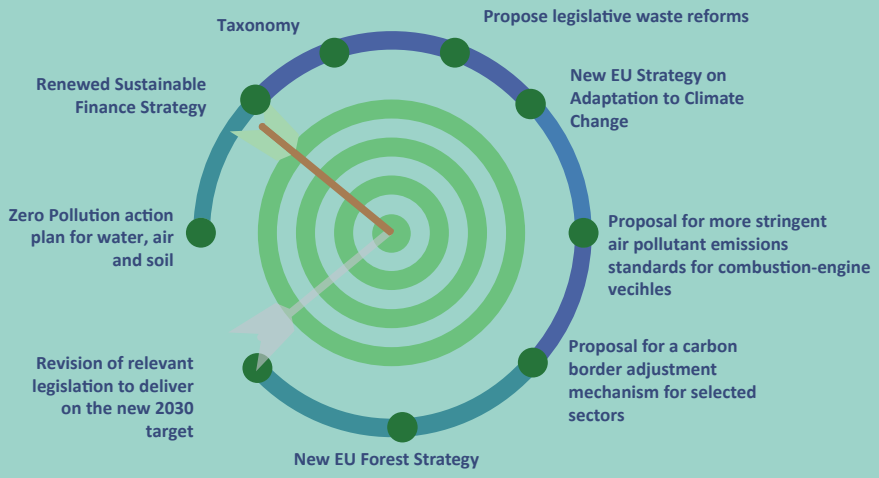


Source: General Directorate of Meteorology , TSKB Economic Research

European Green Deal Agenda in 2021

The European Commission concentrated its policy efforts around climate mitigation and adaptation in 2020. Having presented the European Green Deal Investment Plan by the beginning of 2020, the Commission released the Climate Law in March 2020. The Climate Law aims to realize the net zero emission target by 2050. The Commission also presented its Farm to Fork Strategy directed at a sustainable food system. In October, the eighth Environmental Action Program was proposed, while the European Climate Pact was launched in December to engage citizens and communities in action for climate and environment. Having reached these goals, the Commission expects a more packed agenda for 2021: this year, the Commission will renew its sustainable finance strategy and propose a carbon border adjustment mechanism for selected sectors. The EU Forest Strategy is expected to be released this year and a proposal to support zero carbon steel-making processes will be published. The Commission also plans to pass a proposal for more stringent air pollutant emissions standards for combustion-engine vehicles in 2021. Hence, it is clear that the European Green Deal agenda will involve more ambitious and radical efforts this year.

European Green Deal 2021 To Do List



Shipping orders slump with owners unsure of which “green” fuel to use

According to IHS Market’s data, new orders decreased as the shipping industry has not been fully able to foresee the transition to alternative technology in the near future amid looming deadlines for the use of less-polluting fuels. Ammonia, hydrogen, biofuels and electrification will emerge as the key alternative resources for upcoming sales in the world trade fleet; however, the efficient use of these resources within the next few years appears somewhat difficult since most of these technologies remain at a trial stage, according to experts.

In 2018, the International Maritime Organization (IMO) pledged that the shipping industry aimed to halve greenhouse emissions by 2050, from their 2008 levels. The IMO also introduced rules at the beginning of last year restricting the use of marine fuel with a sulphur content of over 0.5% for ships which do not have environmentally sensitive systems. According to IHS Markit, there was a slump of around 10% in ship orders in 2019, followed by a fall of more than 50% in 2020 – the steepest fall in orders for more than two decades.

Climate Finance

Green bond market exceeds US$ 1 trillion

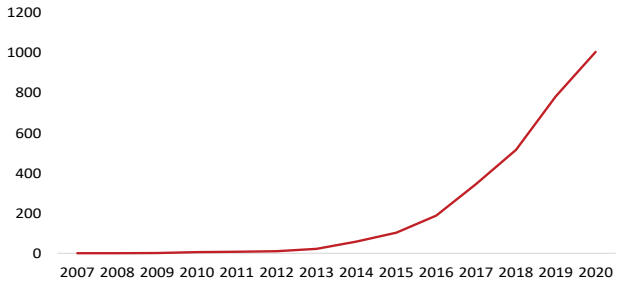
As the COVID-19 outbreak put the global economy on hold in the March-April period, green bond issuances ground to a halt, as with many other issuance types. When the economy rebounded during the normalization period, there was a revival in green bond issuances, taking ten-year cumulative issuances to over US$ 1 trillion by the end of 2020. The market is expected to return its rapid growth trajectory in 2021 and maintains its high potential in the long-run.

Climate Bond Initiative (CBI) database indicate that new green bond issuance reached US$ 269 billion in 2020, surpassing the green bond supply of US$ 266.1 billion in 2019. While the highest monthly issuance was realized in September with US$ 36.8 billion of volume, the lowest supply was materialized in March with a volume of US$ 5.4 billion.

Even though advanced economies constitute the largest share in total green bond supply, emerging market economies have become important players in the market. Some highlights of the green bond markets as of the 2020 year-end are set out below:

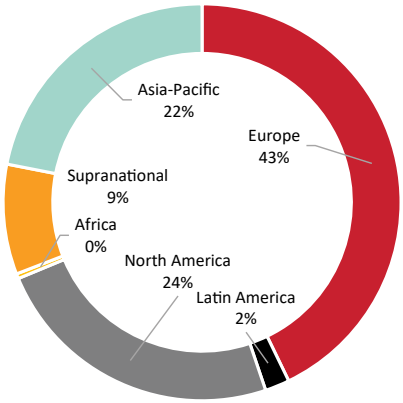
- While advanced economies accounted for 72% of the market, the share of emerging markets stands at 19%. Supranational banks account for the remainder.
- In terms of the regional composition, Europe holds the highest share (43%), followed by North America (24%) and the Asia-Pacific (22%).
- European dominance is also reflected in the currency composition of the market with 40% of total supply being euro-denominated, followed by the US dollar (35%) and Chinese yuan (8%).
- Investment in energy ranks first with a 35% share in the use of proceeds in total borrowing. Low-carbon buildings and transport have 26% and 19% shares, respectively, while investments in water infrastructure account for a 10% share.
- In breakdown of issuer type, financial corporations rank first with a 21% share, followed by non-financial corporations (20%) and development banks (16%).

Green Bond Market (US$ Billion)

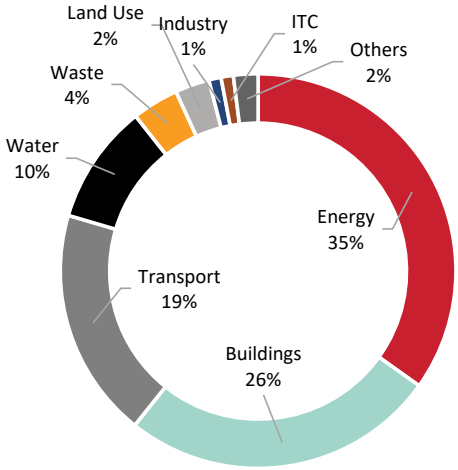


Sources: Climate Bond Initiative, TSKB Economic Research

Regional Composition (%)



Use of Proceed (%)



Source: Climate Bond Initiative, TSKB Economic Research

Although US$ 350 billion in new green bonds are expected to be issued going forward, it is projected that the total supply may exceed US$ 500 billion when considering the possible massive borrowing from European countries. Besides, while governments' pledges on climate issues will require more investment, green bond issuances may grow more rapidly in order to finance these projects. Within this context, the Chairman of the Energy Transitions Commission, Adair Turner, argues that approximately US$ 1.5-2.0 trillion of investment should be undertaken each year over the next 30 years, with additional green bonds to be issued, in order to reach the target of a zero-carbon world by 2050.

Rise in global sea levels could exceed high-end projections

The effects of climate change are increasingly apparent throughout the world. Due to its terrifying impacts, sea level rise is one of the most important fronts in the efforts to tackle climate change. Since the beginning of the 20th century, global sea levels have risen by about 21 centimeters (cm). In the past century the largest contributor to the rise in sea levels has been thermal expansion (the change in volume in response to changes in temperature). Today, however, it is the melting of ice sheets, mainly from Greenland and Antarctica, which is responsible for a greater proportion of the rise in sea levels, and this proportion is growing constantly.

The report released by the Intergovernmental Panel on Climate Change (IPCC) in the last quarter of 2019, found that global sea levels are expected to rise by between 29-110 cm compared to their 1986-2005 average by the end of the century. While the projections are alarming enough, some scientists caution that these figures do not reflect the rapid change in polar regions or the full range of scenarios. A group of scientists consisting of well-known glaciologists and experts on the rise in sea levels published a paper on the topic. The paper states that the IPCC projections did not place sufficient emphasis on the possible melting in Antarctica in a scenario where global temperatures are projected to soar by around 4°C, given that current models used to project melting are still not sophisticated enough to predict the behavior of unstable glaciers. Another point of criticism contained in the paper was that the data the IPCC uses in the report only includes the numbers which meet their criteria for scientific accuracy with an acceptable degree of confidence, which stands at 66%. With this paper, scientists aimed to better make the case to the IPCC leadership to explain the reality of potential Antarctic melting before release of its new report for the 2021-22 period.

Studies on the topic have found that the rise in sea levels has accelerated in the last three decades. Thus, healthy assessment of the observations and effective communication concerning the potential results of the rise in sea levels is vital when it comes to policy-making on climate change.

We Need to Improve Our Soil

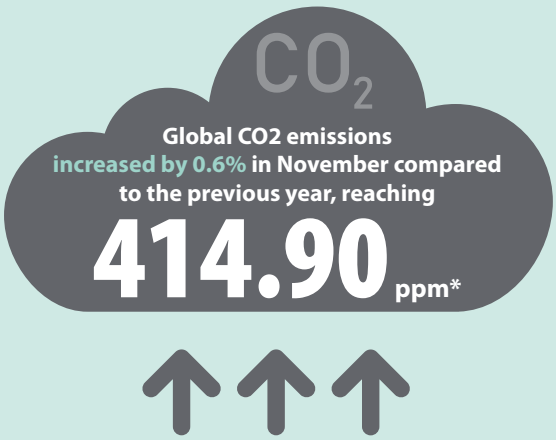
More than a third of the world's soil needs improvement. IPCC estimates that this rate could rise to 90% by 2050 if no action is taken.

A medium-healing soil produces 30% less food and can store about half as much water as healthy soil. By 2050, almost half of the world's population is expected to be living in drought conditions, while in 2050 we will need to produce up to 60% more food than we do today. Therefore, improving the soil will help secure future food supplies, reduce water stress and mitigate climate change.

Farmers and farming practices should be at the forefront of efforts to improve the quality of soil, according to the World Economic Forum. In the meantime, forestry practices, water utilities and the waste industry will also be crucial for soil improvement.

Farm to Fork Strategy Might Decrease Agriculture Production

The U.S. Department of Agriculture released a new study examining the possible economic impacts of the European Green Deal. According to three distinct scenarios on the effects of the Farm to Fork Strategy, agricultural production in the European Union region is expected to decline by 12% and global agriculture production set to decrease by 1%. In the event that the strategy is embraced and put into action globally, global agriculture production is estimated to decline by 11%.



*parts per million

Time to Transform Cities!

The Ross Center, established by the World Resources Institute (WRI) for sustainable cities, holds a global competition each year to reward cities for their transformative urban changes. Through this competition, the WRI strives to be a pioneer and source of inspiration in urban management by sharing groundbreaking sustainable urban transformation stories.

There were more than 260 applications from all over the world for this year's contest. The five cities to reach the finals were Rosario in Argentina, Ahmedabad in India, Nairobi in Kenya, Monterrey in Mexico and London in the UK. These cities demonstrate the essential role of cities in combating climate change and inequality at the same time.

Each of the finalists adopts a different approach, such as limiting emissions with transportation systems, urban agriculture, and tackling flooding in shantytowns. What these approaches have in common is that cities can be more sustainable and more productive for more people through participatory and environmentally friendly change. Cities can play a critical and vital role in a rapid green recovery especially after the COVID-19 pandemic.

While the city of Monterrey provides innovative regional transformations for more compact and livable cities in the region called DistritoTec, Nairobi has managed to increase access to basic services and create new business

opportunities by establishing public spaces which reduce the risk of flooding. The city of Rozario has been working to create agricultural programs aimed at promoting sustainable food production. In Ahmedabad, the focus has been on creating leaders in the fight against climate change by supporting women affected by the climate crisis. London has designed special air zones to encourage residents and businesses to travel by public transport, as well as promoting walking and cycling.

Fed joins consortium supporting Paris climate goals

The US Federal Reserve (Fed) has joined a consortium of central bankers supporting the Paris climate goals. On December 15, the Fed announced its membership of the Network for Greening the Financial System (NGFS), a group of 75 central banks formed to address climate change through financial practices. The Fed began participating in NGFS discussions and activities more than a year ago.

The decision came just days after the President-elect of the US, Joe Biden pledged to re-join the Paris climate accord. A number of Congress members had been requesting that the Fed becomes a member of the NGFS and conduct periodic stress tests to measure large banks' ability to weather financial risks brought on by climate change. Biden's policies are expected to contribute to surge in green bond markets in the medium term. Green bond market is anticipated to grow at a considerable rate along with the recovery package worth €225 billion announced by European Union in 2021.

Climate 101

Parts per million: The scientific term used to indicate the concentration of pollutants, which represents one particle in each one million particles

Renewable fresh water supply: The term used to indicate the combination of precipitation water flowing into rivers and returning to aquifers with surface and groundwater flowing from neighboring regions

How is Water Potential Quantified?

Can Hakyemez
TSKB Economic Research

hakyemezc@tskb.com.tr

The problem of access to water in the world has become even more important in recent years. As time progresses, the problem of global access to water becomes more common, the issue stands out as the problem of a wider population. Well, can water availability, which has become an important issue in the world, be quantified? Various indicators have been developed to show the state of water potential in the world within the framework of studies conducted in both public and private sectors. The most importance of these indicators is the Falkenmark Indicator developed in 1989 by Malin Falkenmark, a Swedish water expert. The Falkenmark Indicator is based on the measurement of renewable water available per capita in a region and is calculated by the ratio of the available water resources of the relevant region to the number of people living in the area.

The Falkenmark Indicator of more than 1,700 m3/person-year indicates that the relevant region is water-rich, whereas the indicator below this value classifies the important of water management in different degrees. The decline in the value of the Falkenmark Indicator increases the need for both the public and private sector to pay more attention to projects related to water management.

When the potential of water resources of countries are examined, the distribution of water resources in the world varies significantly on the basis of countries. Countries with high water potential, such as Russia, the United States, Canada, and Brazil, are classified in water-rich countries. When the 2019 population data is used in Turkey, Turkey appears to need a more planned and careful water management with an indicator of 1,358 m^3/person-year. Countries with less Falkenmark Indicator value than Turkey, such as South Africa, Algeria and Israel, are among the countries with a much more careful water management. With the assumptions of constant water resources and increasing population, we need to pay more attention to water management and water savings.

Country	Falkenmark Indicator (m^3/person-year)
Canada	74,263
Norway	71,807
Brasil	39,924
Russia	31,219
China	2,048
Turkey	**1,358**
South Africa	542
Algeria	333
Israel	184

Source: UNSTATS, World Bank

Denmark to cease oil and natural gas exploration in the North Sea

Denmark announced the cessation of oil and natural gas exploration activities in the North Sea as part of its efforts to gradually wind down fossil fuel extraction by 2050. Some 80 years after the first discovery of hydrocarbon resources in the region, the Danish government voted against the award of oil and natural gas licenses. The Minister of Climate, Dan Jørgensen commented on the decision: "We are the biggest oil producer in the European Union. Therefore, our decision will set an example for other countries. We are ending the era of fossil fuels."

Climate Change Transforms Agricultural Production Patterns

In a Dünya News report, sectoral representatives have cited that instability in rainfall regimes has led to a shift in cultivation and harvesting seasons. The corn cultivation period in Adana has been shifted backwards from March-April to February-March, while the harvesting period also shifted from the second half of September back to the first half of August. Due to rising temperatures in southern regions, farmers in Antalya have started to cultivate tropical fruits such as dragon fruit, pepino and avocado. In interviews with the press, representatives of the agricultural sector highlighted the importance of developing new drought-resilient seeds and fruits as well as domesticating early or late harvested agricultural plants.

In December 2020, Turkey's average temperature exceeded the long-term December average by

2.6 °C

In Short

Global greenhouse gas emissions dropped significantly in 2020

Global greenhouse gas emissions plunged by roughly 2.4 billion tons this year, a 7% drop from 2019 and the largest decline on record, triggered by worldwide Covid-19 restrictions, according to a new study carried out by the University of East Anglia, the University of Exeter and the Global Carbon Project. The US recorded the largest drop in carbon emissions, at 12%, followed by the European Union, with an 11% fall, according to the report. Among developing nations, India recorded a 9% drop in carbon emissions but China only recorded a 1.7% dip in carbon emissions, thanks to the shorter lockdown measures.

Updated Emission Mitigation Targets

In December, which marked the fifth anniversary of the signing of the Paris Agreement, the European Union (EU) updated its emission reduction targets. EU Leaders have agreed to reduce greenhouse gas emissions by 55% compared to their 1990 levels by 2030. The EU's goal is to zero net greenhouse gas emissions by 2050.

Red Alert for Climate!

The United Nations (UN) Secretary General, Antonio Guterres, called on all countries to declare a "climate emergency". Guterres stated that worldwide emissions should, by 2030, be 45% lower than their 2010 levels, warning that only then could global warming be limited.

Update on China's Emissions Target

At the UN Summit, Chinese president Xi stated that China aimed to reduce carbon intensity by more than 65% by 2030. China's previous target for carbon intensity reduction, defined as carbon emissions per unit growth, was around 60-65%. As part of the reduction target, China expects to nearly triple its installed capacity for wind and solar power from 415 GW in 2019 to 1,200 GW by 2030.

Europe's Hottest Year on record

The year 2020 was recorded in Europe as the hottest year on record. The global average temperature in 2020 was 0.6°C above the average for the 1991-2010 period, whereas temperatures in Europe were 1.6°C above the average. Meanwhile, according to a recent study conducted by an insurance company, as the second hottest year in global history, there were 8,200 deaths in 2020 resulting from storms, fires and flooding and the total financial loss due to these disasters was calculated as US$ 210 billion.

EU member states approve the European Investment Bank (EIB) Group Climate Bank Roadmap 2021-2025

"The EIB Group Climate Bank Roadmap 2021-2025: Turning ambition into reality" demonstrates the bank's support for climate action and environmental sustainability investments. The EIB commitments are to increase the share of the EIB's financing dedicated to climate action and environmental sustainability to 50% by 2025; to help unlock at least € 1 trillion of investment earmarked for climate action and environmental sustainability from public and private partners by 2030; and align all financing activities with the principles and goals of the Paris Agreement by the end of 2020.

The World Bank Group's Climate Finance Target

The World Bank Group announced that it would allocate an average of 35% of its financing in the next five years to tackling climate change. This rate is more ambitious than the 28% target for the 2016-2020 period. The World Bank Group aims to use 50% of this funding to support climate mitigation and adaptation.

About Green Swan Platform

The concept of "Green Swan", which expresses the low probability but high destructive risks related to climate, occupies the first rank globally in the agenda with the increasing effects of the climate crisis every day. Today, the climate crisis stands against us as the biggest obstacle to sustainable and inclusive development.
The industrial Development Bank of Turkey, which has been working for Turkey's economic, development and social development for 70 years, established "Green Swan Platform" in order to produce solutions to this global threat.
Aiming to bring public-private sector and NGO representatives, international organizations, academics, students and the press together, the Platform invites all stakeholders to think together and produce solutions in order to achieve "Green Economic Recovery".

About TSKB Advisory Services

While TSKB supports Turkish private sector investments with its thematic loans and innovative financing products, we continue to create added value for the business world and all of the drivers of development with our sector specific advisory services which we have been offering for 35 years. With our advisory teams consisting of financial advisors, engineers and economists, we guide the companies operating in the sectors driving the Turkish economy in its journey of transformation, development and sustainability. TSKB supports businesses to assess the risks and opportunities with data-based methods associated with environmental, social and governance (ESG) policy and to analyse the public and political expectations.

For more inquiries and information, danismanlikhizmetleri@tskb.com.tr

Economic Research
ekonomikarastirmalar@tskb.com.tr
You can access our research products by clicking here.

MECLİSİ MEBUSAN CAD. NO 81
FINDIKLI İSTANBUL 34427, TÜRKİYE
Tel: (90) 212 334 50 50 faks: (90) 212 334 52 34

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