IICEC | SABANCI UNIVERSITY ISTANBUL INTERNATIONAL CENTER FOR ENERGY AND CLIMATE | NEWSLETTER

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SPECIAL ISSUE:
IICEC CONFERENCE ON GLOBAL ENERGY CRISIS: SOLUTIONS & THE ROLE OF RENEWABLE ENERGY AND THE TREO REPORT LAUNCH

"IICEC will continue its guiding work"

"In 2023, we may even miss the year 2022"

You may download the full report, Türkiye Renewable Energy Outlook, from IICEC's **TREO Website** and watch the launch conference on **YouTube**.

Examining the global energy crisis and climate change agenda, the IICEC addressed these challenges at a top-level IICEC Conference, Global Energy Crisis: Solutions & The Role of Renewable Energy.

SPECIAL ISSUE: IICEC CONFERENCE ON GLOBAL ENERGY CRISIS: SOLUTIONS & THE ROLE OF RENEWABLE ENERGY AND THE TREO REPORT LAUNCH

Examining the global energy crisis and climate change agenda, the Istanbul International Center for Energy and Climate (IICEC) addressed these challenges at a top-level IICEC Conference, Global Energy Crisis: Solutions & The Role of Renewable Energy, in Istanbul. The conference discussed the paths out of the energy crisis and the importance of renewable energy for a sustainable future and launched another IICEC *first-in-the-sector* pioneering study, the Türkiye Renewable Energy Outlook 2022.

A pioneering study on renewable energy from IICEC

The Founding Chair of the Sabancı University Board of Trustees **Güler SABANCI** opened the conference with an online speech, Executive Director of the International Energy Agency (IEA) and Honorary Chair of IICEC **Dr. Fatih BİROL** was the keynote speaker, and IICEC Director **Bora Şekip GÜRAY** delivered the launch presentation of the Türkiye Renewable Energy Outlook 2022 .

In the conference's **High-Level Business Leaders Panel**, the global energy crisis and the latest developments in clean energy and renewable energy markets were discussed from the business perspective. Sabancı Holding Energy Group President **Kıvanç ZAİMLER**. Zorlu Enerji CEO **Sinan AK**, Borusan EnBW Enerji General Manager **Enis AMASYALI**, Shell Türkiye Country Chair **Ahmet ERDEM**, ING Türkiye Board Member **Semra KURAN**, and Sanko Energy CEO **Hakan YILDIRIM** moderated the panel and shared their views on current energy and climate topics along with priority action areas towards to achieve a more sustainable energy future.

The conference, a traditional end-of-year gathering for IICEC was IICEC's 41st high-level event in a decade and attracted strong interest from the industry, energy market players, diplomats, think-tanks, universities, NGOs, and the press. An audience of roughly 700 people attended the event, which was held at the Sabancı Center.

Güler Sabancı, the Founding Chair of the Sabancı University Board of Trustees, stated that she was very pleased to see IICEC expanding its work and sphere of influence within the ecosystem. "IICEC is a leading model and center in Türkiye. This year, within the scope of the Outlook series, IICEC completed another first and pioneering work in the sector that focusses on renewable energy, one of Türkiye's most important opportunity areas. The study is built upon an analytical perspective and a participatory approach involving stakeholders. IICEC will continue its efforts to support a more secure and cleaner energy future and to guide decision-makers and all stakeholders."

Güler Sabancı: "IICEC is a Leading Model and Center in Türkiye."

"IICEC continues to bring stakeholders together to produce collective wisdom within the model I describe as the success triangle. I am very pleased to see that IICEC is expanding its work and sphere of influence within the ecosystem. Within the scope of its Outlook series, IICEC focused on renewable energy, which is one of the most important opportunity areas in Türkiye this year. It completed its first and pioneering work in the sector. I would like to express my thanks to all the players in the sector who participated in this study. IICEC will continue its efforts to support a more secure and cleaner energy future. At Sabancı University, we attach great importance to creating value from science-based approaches and business collaboration. In this perspective, IICEC is a leading model and center in Türkiye."

Güler Sabancı emphasized that the audience would learn about the latest developments and eye-opening perspectives in the fields of energy and climate from Dr. Fatih Birol with the privilege of IICEC.

"State leaders from US President Biden to French President Macron consult Dr. Fatih Birol on a regular basis for his assessments and recommendations on current energy and climate issues. With his leadership, Fatih Birol has made the International Energy Agency an organization that leads global energy and climate issues. We are very glad that he is also here as the Honorary Chair of IICEC. I would like to thank him again for his support for the vision and development of IICEC."

Dr. Fatih Birol: "Türkiye can grow close to 65% in renewable energy in five years."

Underscoring that Türkiye has made a strong progress in renewable energy in recent years, Dr. Birol emphasized that Türkiye would grow by 65% in renewable energy in the next five years. "This means entering the top 4 in Europe and the top 10 in the world," Dr. Birol added, highlighting Türkiye's great potential in renewable energy resources.

Dr. Fatih Birol: "In 2023, we may even miss the year 2022."

Dr. Fatih Birol, Executive Director of the International Energy Agency (IEA) and Honorary Chair of IICEC, emphasized that 2023 will be a much more difficult year due to the global energy crisis and that the world energy system may miss 2022. "The year 2022 was extremely painful for many people, especially those living in Ukraine. In the future, in 2030, we will not only remember 2022 as a difficult and painful year but also as a year in which clean energy technologies gained historical momentum."

Dr. Fatih Birol reminded the audience that to look at the current energy crisis, it is necessary to look first at February 24, the day Russia invaded Ukraine, and continued as follows:

“There were oil crises in the 1970s, but today we are faced with a very different energy crisis that is far more complex. Russia was the world's top energy exporter before February 24. Its invasion of Ukraine and the steps taken against it caused what I named the First Global Energy Crisis. Currently, oil, natural gas, and electricity prices are rising almost everywhere. Inflation rates in many countries, even almost all of them, have reached levels that we have not seen in 40 years. Many countries and regions, including the European Union, are in danger of entering a recession. Our friends say that “2022 was a bad year, which is true, but I think 2023 will be a much more difficult year.”

“There are two questions,” he added. “ The first is how does the crisis affect countries and how will it continue to affect them?’ For this, we need to look at three regions: developing countries, Europe, and Russia."

Dr. Fatih Birol: “The global energy crisis will affect developing countries, Europe, and Russia.”

Dr. Birol continued: “Developing countries will be the first victim of the current global energy crisis in the coming years. The second is Europe. When this crisis is over, Europe, especially the big countries that are the driving force on the continent, will have to sit down and conduct self-criticism on energy. They should analyze why they have depended on a single country for most of their energy for decades. We conduct an energy review and prepare a report every five years in Europe. One of the last recommendations we made was to diversify its energy imports and avoid being extremely dependent on a single country. Now Europe is paying the price for not following this recommendation. As of now, Europe seems that it will get through this winter. I think the main problem will emerge in the winter of 2023-2024. The third victim of the global energy crisis is Russia, one of the cornerstones of the world energy system. Revenues from energy exports are vital to the Russian economy.

Before February 24, 55% of Russia's total oil exports and 65% of its total natural gas exports were to Europe. Europe was an excellent customer that was paying on time, and Russia lost its biggest customer day by day. It will be very difficult for Russia to find new markets to replace Europe, and it will face a serious problem with the significant loss of revenues. It is possible to say that in the field of energy, the role of Russia, which played a critical role on February 24, will change on a global scale. Therefore, we can say that the global energy crisis brought nothing good for these three groups."

"There is tremendous development in renewable energy in the world today."

Dr. Birol added that the second question is about the impact of the energy crisis on transitions to clean energy. "Our findings are that the current global energy crisis will accelerate the transition to clean and secure energy technologies. There are a few reasons behind this effect. First, many countries have issued emergency programs, including financial and legal measures to accelerate clean and secure energy technologies in their territories. There is a tremendous development in renewable energy in the world today. In the next five years, the world's renewable-energy capacity will increase by 2,400 GW. This increase corresponds to the increase that the world has achieved in the last 20 years. We see a rapid increase in solar and wind power capacities. There is also a significant increase in energy-efficiency efforts. In 2022, the global improvement in energy efficiency was twice the average increase in recent years. The reason for this was both the incentives that were introduced and the steps that were taken by the governments to push for higher energy efficiency. The third important area is electric vehicles. While four out of every 100 cars sold in the world in 2019 were electric, today it is approximately 15 of every 100 cars. According to our estimates, one of every two cars sold in the world's three largest markets – the United States, China, and Europe – by 2030 will be electric. Likewise, there is a serious and very rapid return to nuclear power in the world right now. Governments' response to the global energy crisis will accelerate the transition to clean and reliable energy technologies. The three pillars supporting this orientation are energy security, industrial policies, and actions to mitigate climate change."

"2022 will be remembered as a year in which clean energy technologies gained historical momentum."

"The year 2022 has been extremely painful for many people, especially those living in Ukraine. When we look back on today in 2030, we will not only remember 2022 as a difficult and painful year but also a year in which clean energy technologies gained historical momentum."

"We think that renewable energy in Türkiye will grow by 65% in five years."

In response to a question, Dr. Birol stated that Türkiye has made strong progress in the field of renewable energy and said, "We, at the IEA, think that renewable energy production in Türkiye will grow by two-thirds in the next five years. This growth would put the country among the top-4 in Europe and top-10 in the world. Our potential is huge. Solar, wind, geothermal, hydroelectric power and others, I hope Türkiye can increase its renewable energy output even more."

IICEC Director Bora Şekip Güray: "Türkiye can gain ten units of economic contribution from one unit of investment."

Güray presented the key findings of the **Türkiye Renewable Energy Outlook (TREO)**. "According to our analyses, the proportional contribution of renewable energy in electricity generation in Türkiye may double, and the contribution of renewable energy in the total energy system may increase by more than four times until 2050. One unit of renewable energy-based electricity investment increase will create ten units of savings in imported fossil fuel expenses and emissions-related costs."

Making the launch presentation of the IICEC's Türkiye Renewable Energy Outlook 2022 Report at the conference, IICEC Director Bora Şekip Güray stated that they presented seven concrete recommendations to all stakeholders for a more efficient and robust growth in renewable energy.

According to IICEC's Türkiye Renewable Energy Outlook, the proportional contribution of renewable energy in Türkiye's electricity generation may increase twofold, and the contribution of renewable energy in the total energy system may increase more than fourfold by 2050. In the High (high adoption) Scenario, nearly 90% of electricity generation can be met from renewable energy in 2050. The fastest growth will be in solar and wind, and their contribution to electricity production will reach two-thirds in 2050 with a proportional increase of four times. In IICEC's analysis, the weight of fossil fuels is greatly reduced, which provides critical gains to the Türkiye's energy economy and environmental performance.

"Investments for a renewable energy-oriented and efficient electricity system will greatly reduce Türkiye's fossil fuel imports and emissions. This will be the most important component of a more secure and cleaner energy future. One unit of additional electricity investment will create ten units of savings in imported fossil fuel bill and emission costs." Güray noted that supporting efficient and strong growth in renewable energy requires a number of improvements across the energy system including in the energy market framework, investment climate and associated financing models, electricity networks, clean-energy technologies, and strategic targets and objectives."

IICEC's Türkiye Renewable Energy Outlook presents seven concrete suggestions to all stakeholders, including a human resources development focus, to utilize Türkiye's high growth potential in renewable energy and related technologies to benefit from multidimensional opportunities for energy security, clean energy transition, and a more competitive and technology-oriented industrial development. (Please see Page 11 for the main findings and further details of the TREO Study.)

BUSINESS LEADERS PANEL

In the conference's high-level business leaders panel, sector leaders evaluated the current energy crisis, actions towards a clean energy future, and energy market-related expectations for 2023. The panel was moderated by Sabancı Holding Energy Group President **Kıvanç ZAİMLER**, Zorlu Enerji CEO **Sinan AK**, Borusan EnBW Enerji General Manager **Enis AMASYALI**, Shell Türkiye Country Chair **Ahmet ERDEM**, ING Türkiye Board Member **Semra KURAN**, and Sanko Energy CEO **Hakan YILDIRIM**, who shared their perspectives on renewable and sustainable energy strategies.

Sabancı Holding Energy Group President Kıvanç ZAİMLER: "Crises also bring opportunities."

"Today, while the energy transformation agenda is advancing rapidly, there is still the ongoing Russia-Ukraine war taking place alongside energy-security debates in Europe and record high energy prices."

Zaimler noted that the crises also bring opportunities. "In the world wars, the world's greatest innovations have emerged. The environment created by the Russia-Ukraine war similarly accelerated the development of clean and reliable energies. I hope that the economies of clean and secure energy technologies can further improve thanks to the benefits of competition." Zaimler noted the importance of Türkiye's energy market exchange and its clean-energy technology advancements. He also emphasized that the TREO report was prepared with an analytical perspective and offered solid recommendations.

Zorlu Enerji CEO Sinan AK: "Turkish investors are extremely eager for energy."

"It is obvious that change and transformation cannot happen in one day to fix the energy crisis. A long time is needed to establish renewable energy infrastructure, sustainable mining required for battery and storage systems, and other necessary facilities. When we look at the perspective of Turkish investors in the energy sector, we see that they are eager to invest. We also see that investing and competing in Europe is more expensive and challenging compared to other regions such as the Middle East. We see this in our e-charging station investments in Europe. I think that in addition to their investments in our country, Turkish energy investors should turn their focus to the Middle East, India, and the United States when considering opportunities and incentives, especially in the field of renewable energy.

Ak also underlined that he attaches great importance to the Black Sea gas discovery. "I think Türkiye will have an advantage in every sense when domestic gas production reaches the announced levels."

Borusan EnBW Enerji General Manager Enis AMASYALI: "We are witnessing the birth of a new energy economy."

Amasyalı emphasized that the world is in the process of a major energy transformation that needs to respond to both the climate crisis and the energy crisis. "Today, in the midst of the climate crisis and the energy crisis, we are witnessing a major energy transformation: the birth of a new energy economy. In the past, energy transition cycles were experienced with great turmoil, from biofuels to coal and from coal to oil, with the use of all available fuels being added together. The climate crisis, on the other hand, has put the whole world in a process in which some resources need to be removed from the equation. The climate and energy crises are interconnected, and we must respond to both quickly.

The right investment decisions made today will be the historical milestones for a clean and secure energy future that is also affordable for consumers. At this turning point, we see that the decisions are being taken in the context of the energy crisis that have greatly accelerated the clean energy transformation."

"The energy policy of our country within the framework of energy-supply security, affordable energy supply, and the 2053 net-zero target aims to make maximum use of renewable energy sources and energy efficiency initiatives. The 2053 net-zero target and the carbon border-related regulation within the framework of the Green Deal will accelerate Türkiye's transformation to clean energy."

Amasyalı noted that although Türkiye is rich in terms of renewable-energy potential, currently only a small part of this potential is being utilized. "Predictable, sustainable investment and finance mechanisms that will bring lawmakers, financial institutions, and investors together for the common benefit will play a vital role in realizing this great potential."

Amasyalı also highlighted the importance of human resources to advance the energy system development and to address the current brain drain from the Turkish energy sector.

Shell Türkiye Country Chair Ahmet ERDEM: "I find predictable and efficient energy market development critical."

Erdem noted: "In 2022, war and human tragedy, energy-security risks, climate change concerns, rapidly rising energy prices, global inflation, and recession expectations were on the agenda. Under these conditions, energy transformation will continue, and renewable, zero and low-carbon energy investments will even accelerate."

Erdem underlined the importance of efficient and predictable energy market development to reach energy security and clean energy objectives. He emphasized that 2023 would be a difficult year in the global energy system.

“As energy systems change around the world, Shell is playing a leading role. At Shell, our goal is to be a net-zero emissions energy business by 2050. Today we are one of the world's largest producers of biofuels and have 10% of the global electrolyzer capacity for hydrogen production. We aim to sell approximately 560 TWh of electricity per year by 2030. We have increased our electric vehicle charging network from approximately 60,000 in 2020 to approximately 90,000 at the end of 2021. We aim to increase it to over 500,000 by 2025 and 2.5 million by 2030."

ING Türkiye Board Member Semra KURAN: “We are moving towards our net-zero targets for 2050 with innovative solutions.”

Kuran remarked: “Energy plays a critical role in solving the global problems we face today. In this period, where investments for a net-zero world are expected to increase by more than 50%, renewable energy investments will assume the largest share. In this respect, it is of strategic importance for financial institutions to develop green-financing instruments, provide consultancy to their customers, and establish the necessary frameworks and standards to ensure that these investments are realized with a great focus on sustainability, both at the national and global level.”

Kuran also noted that international cooperation is key for a more sustainable future and that ING, an institution that has been leading the sustainability movement since the 1990s, is moving towards net-zero targets for 2050 with innovative solutions in this field. Kuran also discussed COP 27 outcomes and added the importance of business orientations towards achieving sustainability objectives. “While minimizing the effects of our own operations, we also develop products, services, solutions, and standards that play a role in helping our customers and business partners achieve their sustainability goals. At the same time, we attach importance to raising awareness in the societies in which we live. In this context, we strengthen our work through collaborations and memberships with national and international platforms. As a reflection of this, we find our cooperation with IICEC very valuable, as it strengthens our own climate action efforts and serves social, economic, and environmental transformation.”

Sanko Energy CEO Hakan YILDIRIM: “Lack of predictability is the main concern while new technology solutions remain high on the agenda of the business community.”

Yıldırım commented: “As Türkiye, we need to focus on what kind of roadmap we should follow in renewable-energy technologies. Today, there are very important issues that both excite and preoccupy the energy sector in our country. Undoubtedly, the biggest concern of the industry is uncertainty. However, there are also exciting topics. One of these, especially after the Russia-Ukraine war, is the understanding of the strategic importance of renewable energy in a way that will never be forgotten. Therefore, it is a fact that we will experience processes where the efficiency of technology increases and the cost decreases. The developments to be experienced in the fields of electric storage and hydrogen, especially solar energy, arouse great excitement throughout the sector."

Yıldırım emphasized that Türkiye has made considerable efforts in the field of renewable energy, especially in wind and solar. “Today, 55%-60% of wind turbines can be manufactured locally. There is a local manufacturing capability from the raw material, namely polysilicon, in the field of solar energy. There are also local module manufacturing capabilities in the battery business, and now the companies that will manufacture solar photovoltaic cells have begun their investments.

We must create local demand. There is a need for steps that can pave the way for the sector, and predictability is key”.

The panel underlined the need for improved energy-market predictability, the potential for many clean-energy technologies, and the business orientations to support a more secure and cleaner energy future.

IICEC Coordinator Dr. Mehmet Doğan Üçok: “IICEC continues with its ‘polar star’ vision in energy and climate matters with analytical reports and top-level events.”

In the opening note of the conference, Dr. Üçok said: “IICEC continues with its ‘polar star’ vision, with analytical reports and top-level events in energy and climate matters.

Within the unstable geopolitical, economic and energy crisis fluctuations that we all are passing through globally in the past months, the Executive Director of the IEA said that the world faces its first ‘truly global energy crisis’. Various perspectives will be presented here today. We will be exploring questions such as: Can this global energy crisis be turned into an opportunity? Will renewable energy and developing new clean energy technologies bring a solution to the crisis? What kind of a roadmap should be followed in the energy transition? How will the energy crisis shape matters related to climate change? Is the aim to reach net-zero becoming even more difficult to reach?

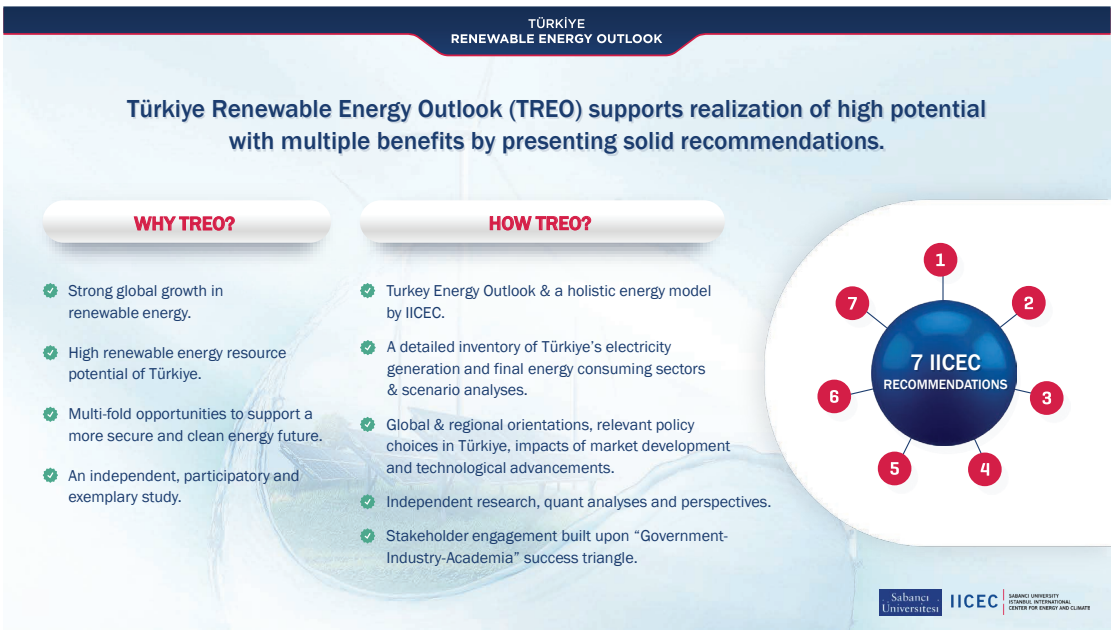
Please click here to watch the conference video in English.
Please click here to watch the conference video in Turkish.

The Türkiye Renewable Energy Outlook (TREO) is based on a detailed inventory of Türkiye's energy economy. The Turkey Energy Outlook was also published by IICEC as a first-of-its kind study in Türkiye, as was the creation of the IICEC Energy Model. This holistic modeling framework employs a database covering the entire energy supply and demand chain and reflects global and regional energy and climate dynamics; current trends in national energy, industry, and climate policies; developments in energy markets; and investments and advancements in technologies.

The first-of-its-kind report analyzes in detail the growth and development perspective of all energy sectors regarding renewable-electricity generation and direct renewable energy use alongside the multidimensional avenues for Türkiye to reach its significant renewable energy potential.

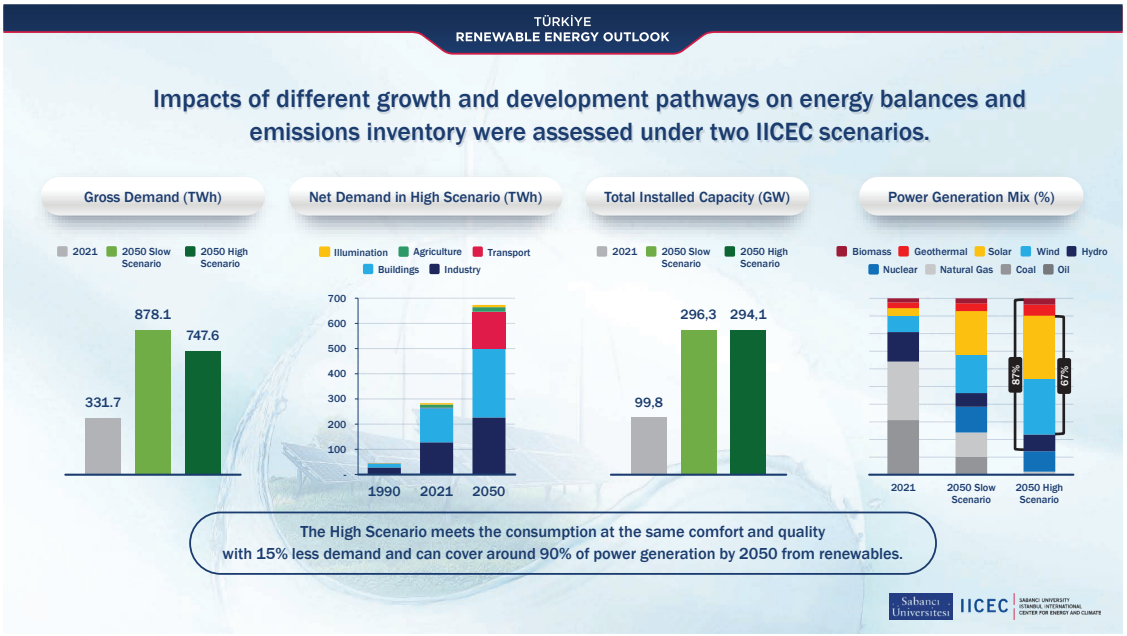
It was carried out with a scenario-based approach to assess growth perspectives in renewable energy through 2050. Two different TREO scenarios are showcased to assess the contribution of renewable energy to improving energy resource diversification and energy security, alleviating the country's energy import bill, achieving a clean energy transition and net-zero emission targets, improving air quality, enhancing overall system efficiency, and fostering sustainability with solid indicators and metrics.

The High (high adoption) Scenario benefits from supportive energy and climate policies and the development of energy markets and an investment environment to fuel growth in renewable energy. The potential of energy efficiency is effectively utilized in the electricity sector and the benefits from global technological developments in renewable energy and other clean-energy technologies are highly captured in end-user energy sectors. It is supported by concrete energy and climate targets and roadmaps encompassing a broad ecosystem including innovation and human resources in support of a renewable energy-driven future. This enables a higher utilization of Türkiye's unexploited renewable energy resource base compared to current trends and provides critical contributions to energy security, energy-related macro-economic balances, clean energy-transformation aspirations, and other sustainability benefits. The Slow (slow adoption) Scenario, on the other hand, exhibits underwhelming progress in all respective areas, especially within the policy framework, and markets do not provide sufficient support for predictable growth in investments.

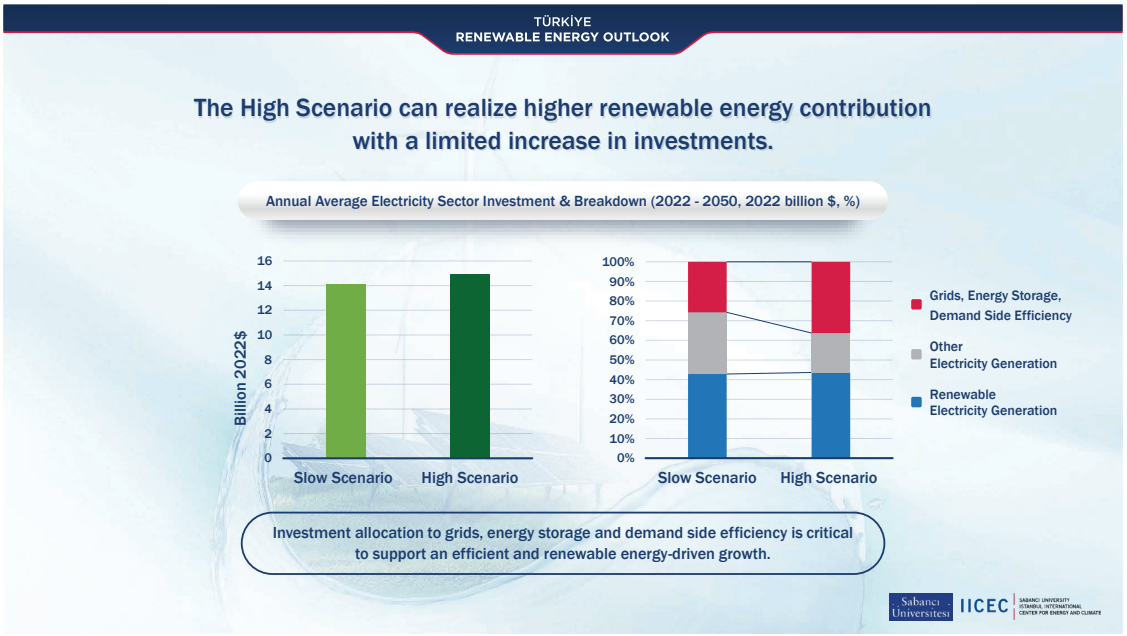


The share of renewable energy in installed capacity and power generation is 76% and 61%, respectively, in 2050 in the Slow Scenario, where there is no significant acceleration in the current growth momentum in renewable energy-based power investments. The installed capacity in the High Scenario, on the other hand, increases to 294 GW in 2050 while the share of renewable energy in installed power reaches 80% in 2040 and 90% in 2050, predominantly from solar and wind energy.

The contribution of renewables in electricity generation increases to over 75% by 2040 and doubles from 43% at present to 87% in 2050. The combined share of solar and wind in gross electricity generation increases by more than four times to reach two-thirds of gross electricity generation by 2050. In the High Scenario, nearly the entire power generation portfolio becomes low-carbon in 2050, supporting the net-zero emission goal and creating significant advantages for the sustainable competitiveness of industries and the overall economy.

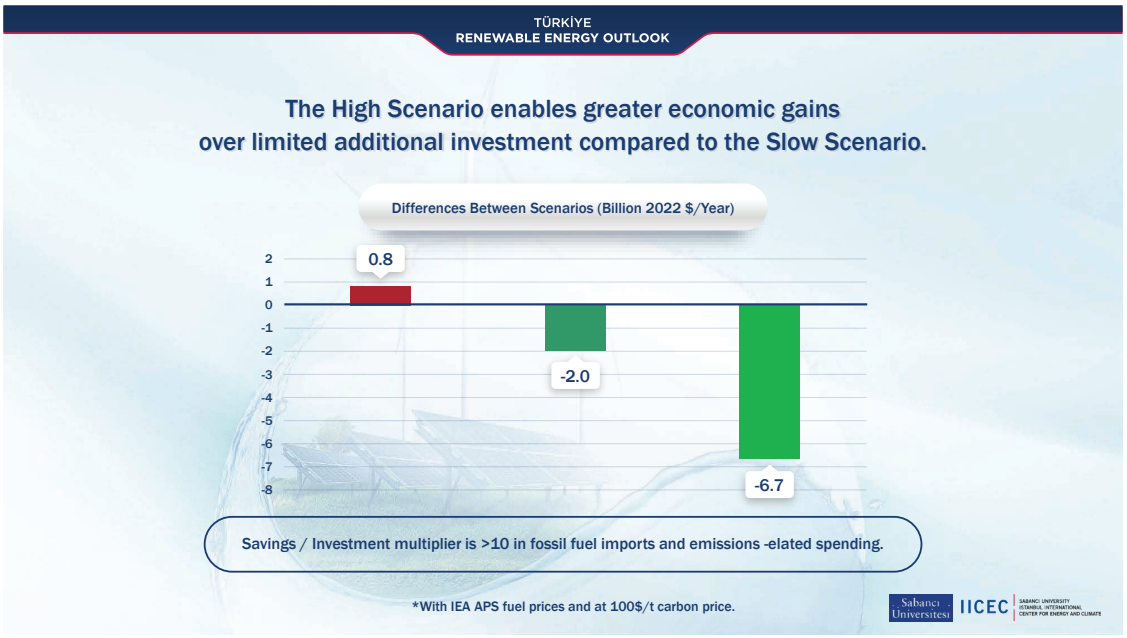


The High Scenario supports more efficient and faster growth in renewable energy in the period until 2050 with an investment requirement of only 6% higher than the Low Scenario ($14.9 billion/year vs $14.1 billion/year in 2022 currency values). However, a significant shift takes place in the sectoral breakdown of investments: the share of power grids, energy storage, and demand-side efficiency investments, which stood below 30% in recent years and is around 30% in the Slow Scenario, increases to roughly 40% in the High Scenario. In the High Scenario, the average annual investment amount for renewable electricity generation in the period until 2050 is estimated as $5.5 billion.



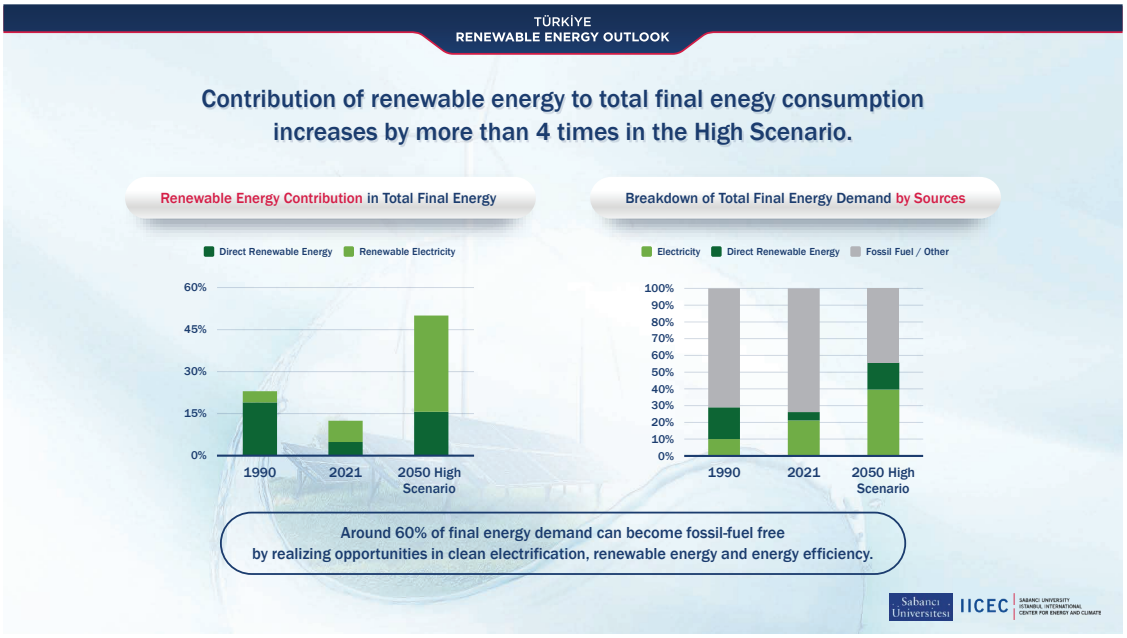
The High Scenario delivers a significant pay-off in energy security, clean energy transformation, and associated costs with renewable energy and energy efficiency-focused investments. For example, compared to the Slow Scenario, Türkiye can realize an annual savings of $2 billion in its energy-import bill despite an annual increase of $800 million in total investment, a fuel import-savings multiplier of 2.5.

In the High Scenario, emissions from electricity generation peak before 2030 and fall 85% below their present level by 2050. At a carbon price level of $100/ton, emissions-related average cost savings of up to $6.7 billion/year can be achieved with the High Scenario, reflecting an emission cost-savings multiplier of 8.4. Therefore, the High Scenario provides 10 units of economic gain from 1 unit of additional power sector investment, especially allocated into renewable energy-based electricity generation and end-use energy efficiency.



TREO analyzes the complete energy system, not only power generation. The share of electricity in final energy demand increases from 20% to 40% by 2050, replacing fossil fuels in energy demand. Meanwhile, the direct contribution of renewable energy in final energy consumption increases from 5% to 15% in 2050, especially with the wider adoption of geothermal energy in buildings and agriculture, solar energy in industry and buildings, and sustainable biofuels in air transport.

Thus, the total share of renewable energy in final energy demand rises from 12% at present to 22% in 2030, 35% in 2040, and 50% in 2050, representing a more than fourfold increase. TREO also notes that towards 2050, annual emissions of important air pollutants such as sulfur dioxide and nitrogen-oxides decrease by one-third compared to 2022 in the Slow Scenario, while the High Scenario nearly eliminates these emissions after 2040 to limited natural gas consumption.



TREO identifies critical improvement areas to achieve the multiple benefits from faster and wider renewable energy development across the energy value chain.

TREO provides seven recommendations to support more efficient and stronger growth in renewable energy. For further information please click here.

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