SWISS TURKISH ECONOMIC FORUM 2023

SWISS CHAMBER OF COMMERCE IN TÜRKİYE
Since 1984

RENEWABLE ENERGY POWERING A SAFER FUTURE

"Why green energy makes economic sense?"

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THE NEW ENERGY PERSPECTIVES

The theme of this year's Swiss-Turkish Economic Forum, organized for the 17th time by the Swiss Chamber of Commerce in Türkiye, was chosen as "Renewable Energy – Powering A Safer Future". Renewable energy is of great importance today, where a new future is being built around the energy equation shaped by many geopolitical developments, especially the Russia-Ukraine War.

First of all, the impact of climate change on human health and the environment is getting worse day by day. According to the World Health Organization, about four billion people in the world live in areas vulnerable to climate change, which is expected to lead to about 250,000 extra deaths per year between 2030 and 2050 from malnutrition, malaria, diarrhea and heat stress alone.

The predictions of various institutions about the damage that climate change will cause on economies are becoming more pessimistic day by day. For example, according to a recent study by the Potsdam Institute for Climate Impact Research, the world could lose 19 percent of its income by 2050 due to climate change. This damage is six times greater than the mitigation costs needed to limit the global temperature rise to 2 degrees. According to the study, it is estimated that the damage of the global temperature increase on the world economy may reach an average of 38 trillion dollars annually and this size will be between 19-59 trillion dollars annually by 2050.

Although positive datas are promising, there are still many issues that need to be overcome within the framework of combating climate change.

The threats to the environment, public health and economy due to climate change make the measures to be taken more and more essential. For this reason, the rapid reduction of dependence on fossil fuels and the orientation towards renewable energy sources are among the top priority agenda items in the world. According to the International Renewable Energy Agency (IRENA) "Renewable Energy Capacity Statistics 2024" report, the capacity of renewable energy projects has increased by 52 percent in 2023 compared to 2019 with the increase in the trend towards clean energy sources worldwide. Between 2019 and 2024, the biggest increase in renewable energy was experienced in solar power plants (SPP) with approximately 138.5 percent, followed by wind power plants with an increase of 63.5 percent. It is pleasing that Türkiye is among the leading countries in this transformation, as Türkiye has managed to increase the share of renewable energy in the energy pie to a dazzling extent.

Although these positive data are promising, there are still many issues that need to be overcome within the framework of combating climate change. In this magazine, which includes interviews with the participants of the Swiss-Turkish Economic Forum, you will be able to find the views of experts from Switzerland and Türkiye on all these changes, the current situation and the future.

ARPAT ŞENOCAK
President of the Swiss Chamber of Commerce in Türkiye

“RENEWABLE ENERGY’S FUTURE”

Global climate change is undoubtedly one of the most pressing issues our world faces today, perhaps the most urgent. Environmental disasters such as massive forest fires, droughts, and devastating hurricanes are occurring with increasing frequency, posing unprecedented threats to the future of our planet. From an economic perspective, research by international institutions highlights that the world must endure trillions of dollars in losses due to these climate-related events.

The solution lies in energy transformation. Unless we shift away from the global economic model based on fossil fuels, we cannot speak of a hopeful future for our world. However, energy transformation is not a challenge that can be addressed solely through energy policies. It requires a comprehensive transformation of all economic components, including climate, energy, finance, and trade, to be tackled simultaneously and holistically.

Taking the necessary steps will bring significant benefits both environmentally and economically. The rapid rise of emerging renewable energy sources, such as green hydrogen, wind, and solar, and the projections for these sources in the 2030s, suggest that energy transformation can also be an economic boon. The progress made by Türkiye in particular, and its high potential in these resources, indicate that embracing this area is inevitable for us as a nation.

For all these reasons, “Renewable Energy – Powering A Safer Future” was the selected theme of the 17th Swiss Turkish Economic Forum organized by the Swiss Chamber of Commerce in Türkiye. During the Forum, Swiss and Turkish leading experts from the private sector, academia and civil society gathered to discuss energy transformation, its economic implications, and the opportunities and challenges it presents in all its dimensions.

The Swiss Chamber of Commerce in Türkiye is committed to keep contributing to the realization of sustainable development goals in the coming years and welcomes the support of its members to progress on that journey.

THE SWISS CHAMBER OF COMMERCE IN TÜRKİYE

HISTORY

Established in 1984, the Swiss Chamber of Commerce in Türkiye (SCCT) is a non-governmental organization dedicated to fostering commercial relationships between Türkiye and Switzerland. Its primary mission is to enhance bilateral trade and investment by improving the business environment and encouraging foreign direct investments.

With around 160 members from both Türkiye and Switzerland operating in the manufacturing, trade, and services sectors, SCCT serves as a vital bridge and communication centre between the two countries. The significant involvement of its members in the Turkish economy strengthens the cooperation links between Switzerland and Türkiye.

SCCT provides essential information, support, and networking services to its members, companies, and organizations in both nations.

VISION

Promoting trade and investment flows between Türkiye and Switzerland

MISSION

Being the voice of the Swiss-Turkish business community

VALUES

SCCT always strives to develop the following philosophy for its members

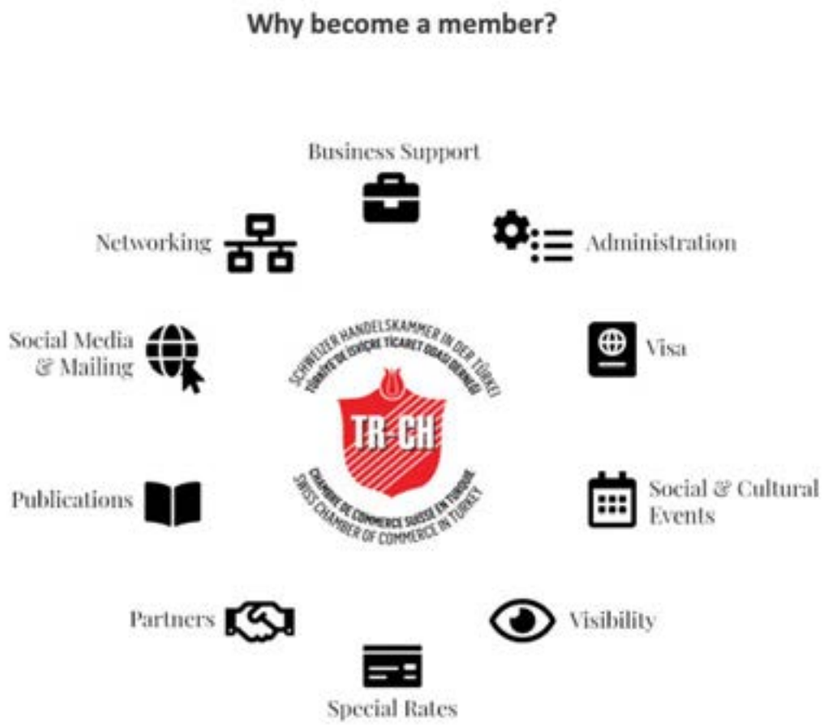
- Trust
- Social Responsibility
- Cooperation
- Innovation
- Information
- Communication

GOALS

- Enhance Networking Opportunities: Organize a diverse range of networking events to connect members and foster relationships, thereby strengthening the Swiss-Turkish business community.
- Facilitate Knowledge Transfer: Promote the exchange of Swiss expertise and innovations to Türkiye, enhancing local capacities and contributing to the development of the Turkish economy.
- Promote a Positive Image: Actively cultivate a favourable perception of Switzerland within Türkiye, showcasing its contributions to trade, investment, and cultural exchange.
- Bridge Collaborative Efforts: Serve as a vital link for cooperation between Türkiye and Switzerland across various sectors to drive mutual growth and innovation.

SERVICES

The Swiss Chamber of Commerce in Türkiye is home to over 160 successful local and international companies and professionals from various industries.



Exclusive Membership Benefits

As a member, you'll gain access to premium networking events, exclusive trade missions, and industry-specific workshops led by top experts. Enjoy priority registration, discounts on events, and a platform to engage with influential leaders and stakeholders from both countries. Embrace the chance to elevate your business and become part of a thriving community that fosters collaboration and innovation.

SCCT MEMBERSHIP

✓ High-Profile Networking Opportunities:
SCCT organizes premium networking events where members can interact with associates, stakeholders, and business leaders from both Türkiye and Switzerland. These events, often featuring special guests from both countries, offer unparalleled opportunities to build relationships and grow your business network.

✓ Priority Access to Exclusive Events & Trade Missions:
SCCT takes the lead in hosting trade missions and exclusive business events throughout the year. Many of these events are only accessible to members, offering you direct exposure to senior Swiss delegates and key decision-makers, opening doors to new business ventures and partnerships.

✓ Exclusive Workshops and Seminars:
Members are invited to participate in industry-specific workshops, seminars, and conferences, led by top experts and business leaders. These events provide valuable insights into the latest market trends and innovations, while also serving as a platform to connect with professionals from diverse sectors across both countries.

✓ Priority Registration and Discounts:
SCCT members receive priority registration for high-demand events, ensuring you never miss out on key opportunities. Members also enjoy free or discounted entry to select SCCT-organized events, as well as special discounts on conferences, exhibitions, and partner-organized events in Türkiye and Switzerland.

Membership provides access to SCCT's network through public events, members- only events, and personalized introductions to other members.
Access to SCCT Memberlist

More about membership benefits, please click here.

SCCT SIGNATURE EVENTS

Event Planning and Management

SCCT has built a strong reputation for organizing impactful and informative events such as seminars, webinars, conferences, cocktail receptions, and launch events. With extensive experience in event management.

Collaborative and Impactful Member Events

Many SCCT events are crafted in partnership with member companies, offering exceptional opportunities to showcase member expertise and boost visibility within the business community. These collaborative events focus on relevant business topics and significant industry trends, creating a platform for members to engage in insightful discussions and forge valuable partnerships.

This approach not only reinforces connections within the SCCT community but also cultivates an atmosphere of innovation and collaboration, benefiting all participants involved.

● Swiss-Turkish Economic Forum

The Swiss-Turkish Economic Forum is a key event hosted by the Swiss Chamber of Commerce in Türkiye, focusing on current economic issues and industry trends. The Forum has been bringing together Swiss and Turkish experts to explore diverse perspectives on topics such as innovation, digital transformation, Industry 4.0, smart cities, artificial intelligence, blockchain, and education—critical areas shaping the future of global industries, sectors, and societies.

Since 2005, the SCCT has organized the Swiss-Turkish Economic Forum annually, with the support of the Embassy of Switzerland in Türkiye, the Consulate General of Switzerland in Istanbul, the Swiss Business Hub Türkiye and Switzerland Global Enterprise (S-GE). This initiative is designed to enhance trade relations between SMEs in Switzerland and Türkiye.

The Forum aims to attract over 200 participants, including business leaders, policymakers, educators, trainers, and professionals from both countries. This diverse audience will facilitate meaningful dialogue and collaboration across various industries and sectors.
For more information, please click here.

● Swiss Days Istanbul

[in cooperation with Swiss Consulate General in Istanbul and Swiss Business Hub Türkiye]

Every two years, the Swiss Consulate General in Istanbul, together with the Swiss Business Hub Türkiye (SBHTR) and the Swiss Chamber of Commerce in Türkiye, organizes Swiss Days Istanbul, a signature event traditionally held at Yapı Kredi bomontiada. This event is dedicated to showcasing Switzerland's vibrant contributions in innovation, technology, education, culture, and more. It also highlights Swiss companies and brands, offering attendees a taste of Swiss culture through workshops, seminars, live concerts, Swiss cuisine, and interactive booths.

Swiss Days Istanbul is open to the public, with free admission, inviting everyone to explore Switzerland's rich offerings while having a fun and memorable experience.

The third edition of Swiss Days Istanbul 2024 took place at Yapı Kredi bomontiada from September 20 to 21, 2024, organized by the Consulate General of Switzerland in Istanbul, the Swiss Business Hub Türkiye, and the Swiss Chamber of Commerce in Türkiye, showcasing a diverse range of activities including workshops, concerts, exhibitor booths, children's activities, a VIP cocktail reception, and the Swiss-Turkish Economic Forum, providing abundant opportunities for networking, learning, and celebrating Swiss excellence.

For more details, you can access the Swiss Days Istanbul 2024 Press & Social Media Report here.

Please find additional information here.

● Swiss-Turkish Webinar Series

[in cooperation with Swiss Business Hub Türkiye]

Considering the huge impacts of the coronavirus on the economy and business globally in 2020, SCCT and SBHTR launched series of virtual events and projects for the members and the business communities to share the most up to date information and resources.

For more information, please click here.

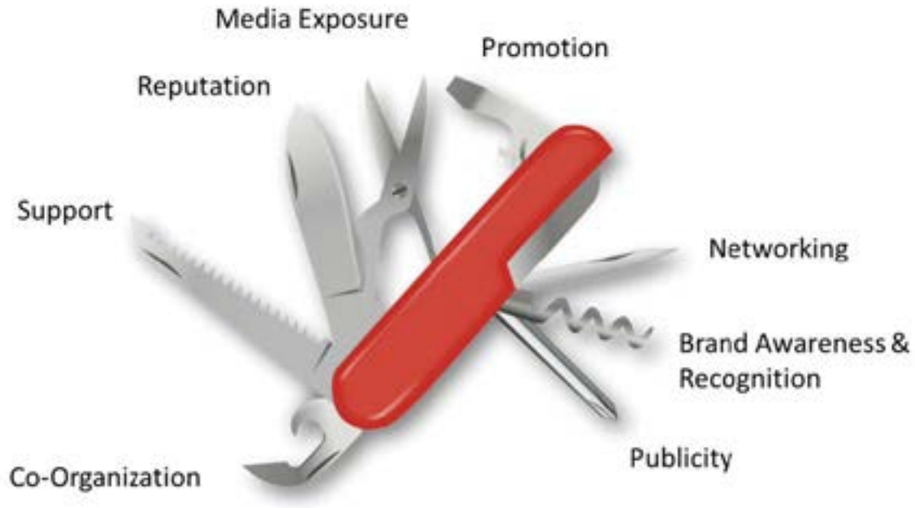
● Swiss-Turkish Startup Program

[in cooperation with Swiss Business Hub Türkiye]

The Swiss-Turkish Startup Program is designed to bridge the startup ecosystems of Switzerland and Türkiye, fostering collaboration and innovation between the two countries. By connecting relevant stakeholders, the program aims to facilitate an exchange of knowledge and best practices, thereby enhancing the growth potential for startups in both regions.

Background of the Program
Switzerland stands out as a global leader in entrepreneurship, with around 40,000 new companies launched annually, ranking second in the Global Entrepreneurship and Development Index (GEDI). This success is driven by its strong emphasis on technological innovation, particularly in artificial intelligence (AI), supported by prestigious research institutions such as ETH Zurich and EPF Lausanne. Meanwhile, Türkiye, as the largest startup hub in Southeast Europe, is witnessing rapid growth with an average of 550 new startups each year, bolstered by substantial investments and a digitally engaged population. As Türkiye formulates its AI strategy, the collaboration with Switzerland through this program is poised to strengthen both countries' positions in the global startup landscape.
For more information, please click here.

SCCT SPONSORSHIP



Sponsorships gain increased visibility and support the Chamber.

The Swiss Chamber of Commerce in Türkiye offers numerous opportunities to enhance your business visibility through target marketing, event showcases and an improved internet presence. Following sponsorships and advertising packages are available.

Please contact the Chamber office

sponsor@tr-ch.org

“TÜRKİYE NEEDS TO TRANSITION TO A COMPREHENSIVE ECONOMIC MODEL THAT ENCOMPASSES BOTH GREEN AND DIGITAL TRANSFORMATION”

Alkım Bağ Güllü, Director of SHURA Energy Transition Center, assessed the current status of renewable energy in Türkiye, future expectations and the necessary steps to achieve success in energy transition.

What are the economic benefits of renewable energy for countries, business world and individuals both in the world and in Türkiye?
In recent years, there has been a significant decrease in the costs of renewable energy due to technological advancements, resulting in increased productivity and higher capacity factors. Globally, as well as in Türkiye, there has been a notable expansion of renewable energy, particularly from wind and solar sources. Between 2010 and 2022, the levelized cost of electricity decreased by 69 percent for onshore wind power and 89 percent for solar power; marking a substantial decline. Consequently, solar and wind energy have emerged as the most cost-effective energy sources worldwide, with numerous economic benefits for countries, individuals and companies.

Renewable energy, being domestic and sustainable, diminished reliance on energy imports, reducing import costs and enhancing energy supply security for countries. Moreover, it contributes to energy affordability as one of the cheapest energy sources available. The integration of renewable energy sources into the power mix reduces electricity costs, as evident in the Turkish power market during periods of high wind and solar generation. Additionally, renewable energy has positive effects on both the environment and the public health, serving as a clean energy source.

For Türkiye, which has developed the capacity of local manufacturing of wind and solar energy equipment, the expansion of the market for these resources will bolster employment and foster the development of domestic industry. Major components such as blades, towers, and generators for wind energy, and panels, inverters and other equipment for solar energy are now produced locally in Türkiye, thanks to the local content incentives implemented since 2010. It is worth

mentioning that renewable power plants also support rural employment, particularly during the installation phase, and overall stimulate economic growth by creating employment opportunities, fostering innovation and introducing new business models.

In the corporate realm, the significance of renewable energy goes beyond mere cost savings. With decarbonization already playing a pivotal role in international competition, embracing renewable energy is crucial for augmenting both international competitiveness and profitability. Moreover, the adoption of renewable energy has become a hallmark of a company's prestige in today's market landscape.

Furthermore, investing in renewable energy unlocks a plethora of new business and employment opportunities. These investments not only benefit local equipment manufacturers and SMEs but also extend to the rural communities where power plants are often situated. In these areas, additional income streams are generated through various ancillary services and support activities related to the installation and maintenance of renewable energy infrastructure.

Some of these domestic equipment companies are also exporters. The foreign exchange income dimension of the business is also important for Türkiye.
Indeed, the significance of domestic equipment companies in Türkiye extends beyond serving the local market. Many of these companies are active exporters, contributing to the country's foreign exchange income. Their role in the export market is vital, not only for their own growth and sustainability but also for Türkiye's overall economic health.

What are the characteristics of the new economic model called "Green growth" on the basis of renewable energies, and how do you describe the green growth model as an economic model?
Traditionally, during the emergence of the environmental movement, there was a prevailing assumption of a contradiction between environmental sustainability and the conservation of natural resources on one hand, and economic growth on the other. This perceived conflict was often encapsulated in the concept of "limits to growth". However, over the past 20-30 years, with the increasing recognition of climate change as a serious threat, a more systematic exploration of the relationship between sustainability and economic growth has been undertaken. This includes the widespread adoption of socioeconomic impact analyses.

These studies have demonstrated that the impact of the energy transition on economic growth is not as limiting as previously thought. The shift from fossil fuels to renewables has, in fact, generated new areas of economic activity, particularly during the investment phase. In many instances, the benefits of this transition have outweighed the costs. Consequently, concepts such as "green growth", "green jobs", and "green transition" illustrate that economic growth can coexist with environmental harmony and carbon neutrality.

However, whether this paradigm constitutes a genuinely new economic model remains a subject of ongoing debate.

What kind of benefits will Türkiye gain from the transition to such an economic model? What are the steps that Türkiye should take to transition to an economic model based on the green economy?
Economic growth is meaningful to the extent that it paves the way for development and welfare increase. In this context, the prospect of a carbon-neutral economy holds immense promise for improving both human and environmental well-being, while also bolstering employment and welfare through new economic avenues. SHURA's previous studies have indicated that even modest decarbonization efforts in Türkiye could yield benefits ranging from $12-13 billion annually, at a manageable cost of $4 billion. In other words, the potential benefits could outweigh the costs by up to threefold.

"Between 2010 and 2022, the levelized cost of electricity dropped by 69 percent for onshore wind power and 89 percent for solar power."

Türkiye grapples with longstanding challenges such as foreign trade deficits, low productivity, and middle-income trap. These issues are not solely attributed to carbon-intensive production but also stem from a reliance on low technology and low value-added manufacturing processes. Consequently, our research suggest that Türkiye should transcend the notions of green transformation and green growth, and instead embrace a more comprehensive and holistic model that addresses industrial, transportation, financial, and trade policies. Priority should be given to decarbonization efforts and enhancing value-added across sectors.

By prioritizing decarbonization and advancing technological capabilities, Türkiye can enhance its competitiveness on the global stage while fostering prosperity and development through increased value creation. This model entails a dual focus on decarbonization and digitalization, shifting from low-tech production methods to higher-tech processes that generate greater value. Moreover, it is imperative for Türkiye to transition to a more integrated model that facilitates advanced participation in international value chains.

To realize this vision, Türkiye must adopt a holistic approach, encompassing green and digital transition. This involves identifying priority sectors, conducting through cost-benefit analyzes, and designing an overarching model that leverages the interconnections and synergies between various sectors. Such an approach will be instrumental in propelling Türkiye towards sustainable economic growth and prosperity in the long term.

When we examine the development of renewable energy in total energy production and consumption in Türkiye in recent years, what do you think are the key points?
Over the past decade, Türkiye has witnessed a remarkable 36 percent increase in electricity generation, with the share of renewable energy in electricity generation rising from 29 percent to 42 percent. This substantial growth in renewable energy adoption has been made possible, in large part, by the dollar-based purchase guarantee provided by the Renewable Energy Resources Support Mechanism (YEKDEM 1). Moreover, the incentivization of domestic equipment manufacturing has facilitated the production of solar and wind equipment within Türkiye.

As of 2023, Türkiye now generates 55 percent of its installed power capacity and 42 percent of its electricity from renewable energy sources. Solar energy, in particular, holds a cost advantage, followed closely by wind energy, although project profitability may vary depending on factors such as location and scale. Despite this, solar energy is experiencing more rapid expansion globally, a trend Türkiye's targets aim to align with.

The National Energy Plan, unveiled at the beginning of 2023, outlines Türkiye's medium-term objectives in line with its net-zero target and includes ambitious renewable energy targets

“Türkiye aims to augment its installed wind power capacity from 12 GW to 30 GW by 2035, with 5 GW coming from offshore wind power plants. Similarly, the solar power installed capacity, currently around 11, is projected to increase fivefold to approximately 53 GW. To achieve these objectives, it is imperative to accelerate investment and install 1.4 GW of wind and 3.3 GW of solar energy annually.”

for 2035. These targets necessitate a substantial increase in both wind and solar power capacities. Specifically, Türkiye aims to augment its installed wind power capacity from 12 GW to 30 GW by 2035, with 5 GW coming from offshore wind power plants. Similarly, the solar power installed capacity, currently around 11, is projected to increase fivefold to approximately 53 GW.

To achieve these objectives, it is imperative to accelerate investment and install 1.4 GW of wind and 3.3 GW of solar energy annually. Additionally, significant investments in grid infrastructure are essential to accommodate the intermittent nature of renewable energy sources. This entails expanding, modernizing, digitizing the grid as well as enhancing its flexibility and resilience. Ensuring the safe and reliable connection of renewable energy sources to the grid is crucial, given that their output cannot be readily controlled with a simple command. Türkiye’s Minister of Energy has emphasized the importance of establishing a green grid and has earmarked $10 billion for grid investments until 2030; signaling a significant stride towards a more sustainable energy future.

In the “Net Zero 2053: Energy Sector Policies” report published by SHURA Energy Transition Center in November 2023, the importance of financially supporting research and development studies in order to integrate new technologies into the system in order to achieve Türkiye’s net zero target is mentioned. What are these new technologies and what role will they play in Türkiye’s renewable energy transition?
Various new technologies are emerging to support the secure integration of renewable energy into the electricity grid. While there are several market-based and technology-driven solutions to enhance grid flexibility, battery storage technologies are currently leading the way. Türkiye is experiencing significant developments in this field, with pre-licenses for battery storage facilities being issued and prices declining. As the technology continues to advance, it is expected to play a transformative role in the widespread adoption of renewable energy.

Another critical area of focus is electrification technologies, which serve as fundamental strategies for decarbonization and energy transition, particularly in energy-intensive sectors reliant on fossil fuels such as industry, transportation, and buildings. Examples include transitioning from natural gas to electric heat pumps in buildings, replacing internal combustion engines with electric vehicles in transportation, and adopting electric arc furnaces in certain industrial processes. Electrifying these sectors, powered by renewable energy sources, is key to achieving decarbonization goals. While heat pumps show promise, they still require support, especially considering the subsidized nature of natural gas prices compared to electricity in Türkiye.

Alternative technologies such as green hydrogen or synthetic fuels come into play where direct electrification is challenging such as heavy vehicle long-haul transportation, air and sea transportation, and industrial processes that require very high heat. Green hydrogen, in particular, is gaining traction and has significant global investment as well as research and development efforts behind it. While there are challenges to overcome, including high costs, storage and transportation issues, substantial progress is anticipated in the short to medium term.

Overall, these emerging technologies offer promising pathways to support Türkiye’s energy transition goals and facilitate the broader adoption of renewable energy sources in various sectors of the economy. Continued investment and research in these areas will be crucial to unlocking their full potential and accelerating the transition to a more sustainable energy future.

In your opinion, what are the steps that need to be taken urgently to implement the policies that will realize the energy transition in Türkiye?
Achieving a successful energy transition requires a holistic approach that extends beyond energy policies alone. Energy serves as a fundamental input for numerous sectors, underscoring the interconnectedness of climate policies, energy policies, financing strategies, trade policies, and other relevant components of the economy. To realize the goal of a net-zero emission economy, Türkiye must implement a comprehensive set of policies that unite all sectors toward this common objective. These policies should be tailored to Türkiye’s priorities and aligned with its broader development goals, including structural reforms.

In pursuit of these objectives, it is essential to establish clear short-, medium-, and long-term action plans. These plans will provide a roadmap for implementing targeted policies and initiatives across various sectors, ensuring progress toward the overarching goal of decarbonization.

Furthermore, effective coordination and management of such a complex transition necessitate the establishment of a central coordination body, led by the public sector. This central body would serve as a platform for bringing together stakeholders from diverse sectors, facilitating collaboration, and ensuring alignment of objectives, action plans, and policies in a coherent and coordinated manner. By fostering collaboration and synergy among different sectors, this central coordination body can streamline the transition process and maximize its effectiveness.

Energy storage draws attention as one of the important points in the realization of renewable energy targets. What is Türkiye’s current position in the field of energy storage, what needs to be done in this field?
Since 2021, significant developments have unfolded regarding the integration of wind and solar energy in Türkiye through battery storage. Incentives have been introduced to facilitate this integration. According to the government statements, developers who establish a 30 MW energy storage facility can acquire a license for a corresponding 30 MW solar or wind power facility without having to compete in tenders. In Türkiye, these licenses are typically awarded through competitive YEKA

“It’s is a threat but it’s also an opportunity for developing countries like us. We can be the pioneer of this industrial revolution. These are areas where you can be a leader in a completely different place, and being able to design them in a geographically equal manner will be a perfect growth and sustainable development strategy for Türkiye.”

auctions, making obtaining them quite challenging due to stiff competition.

Consequently, there has been a surge in applications to the Energy Market Regulatory Authority (EMRA), surpassing the global installed battery capacity. By 2023, approximately 22 GW of preliminary licenses had been granted for battery storage facilities, exceeding the 7.5 GW target set for 2035 in the National Energy Plan. While this surge reflects positive momentum toward renewable energy integration, it also warrants close monitoring, as the allocated capacity is exceptionally high. Failure to meet these targets could potentially limit capacity available for renewable energy projects.

EMRA’s President has affirmed that strict monitoring will be implemented to ensure compliance with these targets. Additionally, the domestic production of these batteries emerges as a significant consideration for Türkiye’s energy strategy.

A successful and just transition in line with the net zero target of Türkiye requires the transition of not only the electricity sector, but also the emission-intensive heavy industry. In terms of sectors with high emissions (iron and steel, cement, chemicals, fertilizers, etc.) where is the Turkish industry in the green transition?
When analyzing the green transition from an industrial standpoint, it can be segmented into three key pillars. Firstly, there’s the imperative to reduce emissions of pollutants in air, water, and soil. Secondly, enhancing resource efficiency and embracing the principles of a circular economy are crucial. Finally, decarbonization, particularly in heavy industry, stands as a pivotal goal.

Regarding emissions reduction, certain industrial sectors in Türkiye will fall under the purview of the Carbon Border Adjustment Mechanism (CBAM) starting from 2026. Türkiye has made some strides in this realm, with ongoing studies and investments aimed at curbing emissions. However, enhanced monitoring and oversight are essential to ensure sustained progress.

Resource efficiency and circular economy principles are gaining traction in Türkiye, with a pressing need for improvements in recycling practices. The iron and steel industry, which heavily relies on recycling, underscores this point. Yet, domestic recycling rates remain inadequate, leading to a dependence on imported materials. It is worth noting that recycling processes themselves can contribute to pollution if not managed properly.

In terms of decarbonization, electrification efforts, particularly in heavy industry, are still insufficient. Green hydrogen emerges as a promising solution, with Türkiye initiating projects and unveiling a Hydrogen Strategy and Roadmap in 2023. Türkiye’s commitment places it among the nations striving for advancement in this field. However, clear identification of priority areas, formulation of supportive policies, legislative development, enhancement of the green hydrogen market, and establishment of detailed action plans are imperative to propel progress further.

The COP28 meetings in December 2023, differed from previous meetings when the fossil fuels term was included as a culprit in the Final Declaration for the first time. How do you interpret COP28 held in December 2023 in terms of global energy transition?
COP28 delivered crucial insights, underscored by robust scientific evidence, revealing the inadequacy of current efforts to cap global warming at 1.5 degrees Celsius. Urgent action toward achieving this target was stressed as paramount. Key actions highlighted included ramping up electrification and energy efficiency, prioritizing renewable sources to decarbonize electricity generation, expediting the decarbonization of heavy industry and long-distance transport, and mitigating the impact of agriculture and food systems on forests and methane emissions.

A ground-breaking shift occurred at COP28 with the acknowledgment of the necessity to phase down fossil fuels to facilitate the transition to a net-zero emissions economy by 2050. This pivotal moment also addressed the imperative to combat energy poverty and gradually reduce inefficient fossil fuel subsidies. Notably, a declaration endorsed by 130 nations committed to tripling global renewable energy capacity and doubling energy efficiency gains by 2030.

Recognizing the projected 30 percent increase in emissions from industries like steel, cement, maritime, and aviation by 2050, the introduction of the Industrial Transition Accelerator mechanism aimed to expedite decarbonization in these sectors. While not constituting a standalone commitment, this mechanism serves as a catalyst for various initiatives geared toward accelerating decarbonization efforts.

Despite these strides, the magnitude of the transition necessitates substantial financing, particularly in developing nations. The establishment of the Loss and Damage Fund was a step forward, albeit the approximately $800 million collected falls significantly short of the required funding.

In essence, COP28 marked a significant milestone in the global fight against climate change, yet uncertainties persist regarding the adequacy of political measures, particularly concerning financing, to attain our climate goals. Continued collective action and bolstered commitments are imperative to bridge this gap and foster a sustainable future for all.

What do you think should be done to achieve the goals?
Increasing renewable energy capacity requires concerted efforts across several fronts. Firstly, aligning national targets with global objectives to triple renewable energy capacity is essential. Secondly, streamlining planning and permit processes to expedite the deployment of wind and solar power plants, which often face lengthy bureaucratic hurdles, particularly in Europe, is imperative. Thirdly, investing in the modernization and expansion of grids is crucial for efficient integration of renewable energy sources. Lastly, developed nations must fulfil their commitment to provide financing to support developing countries in their transition efforts, including increasing climate finance.

To enhance energy efficiency, several steps can be taken. Firstly, maximizing electrification wherever feasible is paramount. Secondly, improving the technical efficiency of fundamental equipment such as heat pumps, air conditioners, and refrigerators is crucial. Thirdly, accelerating the renovation of existing buildings, particularly in developed nations, to enhance insulation and reduce heating or cooling needs is essential.

Moreover, while the transition to electric vehicles is underway, traditional gasoline and diesel vehicles will remain prevalent for years. Therefore, enhancing the efficiency of these vehicles is imperative. Additionally, promoting behavioral changes such as reducing driving speeds and adjusting thermostat settings for heating can further contribute to energy efficiency efforts.

“TÜRKİYE CAN MEET HALF OF ITS ENERGY NEEDS FROM RENEWABLE ENERGY IN 2050”

Sabancı University İstanbul International Center for Energy and Climate (IICEC) Director Bora Şekip Güray evaluated Türkiye’s opportunities in renewable energy.

What are the opportunities that the renewable energy transition will bring for Türkiye?
Türkiye has recently made significant progress in growth based on renewable energy sources. While the share of renewable energy sources in the installed capacity has exceeded 50 percent, it has reached the level of 40-45 percent in electricity generation, depending on the water conditions related to hydroelectric power plants. The high potential of renewable energy sources and the targets in the National Energy Plan offer an important opportunity for these rates to rise rapidly in the coming period. Especially in wind and solar, Türkiye is very advantageous and a significant part of the high potential has not yet been utilized. Strategic priorities, investments and new business models for this purpose, supported by technological development, have the potential to make a significant contribution to strengthening Türkiye’s energy security and clean energy targets. In this context, their contribution to reducing the negative effects of imported fossil fuel weight on the current account balance and their effectivie role in reducing carbon intensity within net-zero targets will continue to strongly support the strengthening of the position of renewable energy sources in the energy system.

As IICEC, you evaluated Türkiye’s renewable energy outlook with a model that includes two scenarios: high and slow. What do the results of both scenarios show us about the renewable energy outlook in Türkiye in 2050?
In our Türkiye Renewable Energy Outlook study, we analyzed in detail the concrete contributions that growth opportunities and development perspectives in renewable energy can provide for energy, climate and technology-oriented growth. In the High Scenario, where the renewable energy potential can be evaluated faster and at higher rates, the share of renewable energy in electricity generation doubles by 2050 and reaches 85-90 percent. Each unit of additional investment to be made in electricity generation from renewable energy, 10 units of import and emission savings can provide economic benefits. In this study, in which we look at the energy system from a holistic perspective, we have seen that the share of renewable energy’s direct contribution to final energy consumption through applications other than electricity generation can increase up to three times. Thus, by 2050, the total contribution of renewable energy to final energy consumption through electrification and direct use can exceed 50 percent. In other words, Türkiye can provide one unit of every two units of its final energy need from renewable energy. This potential offers critical opportunities in a wide spectrum, from energy supply security to reduction in energy import bill, from adaptation to global and regional trends in energy and climate, to an energy transformation focused on the net-zero target, to the competitiveness of industry and economy. This potential offers critical opportunities in a wide spectrum, from energy supply security to reduction in energy import bill, from adaptation to global and regional trends in energy and climate, to an energy transformation focused on the net-zero target, and to the competitiveness of industry and economy. “

“Türkiye is very advantageous, especially in wind and solar, and a very important part of the high potential has not yet been utilized.”

As IICEC, you have prepared a seven-point set of recommendations for the evaluation of Türkiye’s high growth potential in renewable energy and related technologies, which offers multidimensional opportunities for energy security, clean energy transformation, competitive and technology-oriented industrial development. What were the highlights of your suggestions?
In order to support efficient and strong growth in renewable energy, our proposals highlighted the development of market development, investment environment, financing, electricity networks and technological opportunities. The targets within the framework of Türkiye’s National Energy Plan also constitute an important basis for this perspective. It is critical that the growth in the project stock turns into investments. Investments that will strengthen the resilience of the electricity system, not only on the generation side, but also in the networks and as a whole, will continue to be critical for sustainable growth. Leveraging the potential of energy efficiency and digitalization solutions across the entire value chain from supply to demand, thus transforming the growth in renewable energy ecosystems into high value-added opportunities is another important opportunity for our energy sector. Of course, the human resource dimension is of critical importance for our growth and development targets in the energy sector in general, and for competitive and sustainable development in renewable energy. In this context, it is an important development opportunity for us to develop qualified human resources that will support strong growth and competitiveness in renewable energy, together with entrepreneurship ecosystems. We should not forget that the focus on development in renewable energy technologies and manufacturing can provide multifaceted gains for the ecosystem. We see that the steps taken in this direction will play an important role in carrying the energy sector to a safer and cleaner energy future.

“COLLABORATION OPPORTUNITIES BETWEEN SWITZERLAND AND TÜRKİYE, PARTICULARLY IN TECH TRANSFER, ARE PROMISING”

David Reber, Ambizione Group Leader at EMPA, highlighted the economic impact of the renewable energy revolution, the need for innovation, and the importance of international collaboration to advance the energy transition.

In your opinion, what is the economic significance of the renewable energy revolution and how will the energy transition transform the world economy?
The economic significance of the renewable energy revolution is profound and diverse. Globally, the sector employs over 14 million people, growing faster than many industries, according to IRENA. With substantial investments, reaching $303.5 billion in 2020, renewables, particularly solar and wind, compete favorably with traditional fossil fuels. This transition enhances energy independence, mitigates climate change for long-term economic sustainability. Moreover, renewables can bolster a country’s resilience to energy disruptions, such as price volatility in fossil fuel markets or geopolitical tensions. In essence, the renewable energy revolution is vital for addressing environmental challenges and offers significant economic potential.

What are Switzerland’s renewable energy targets and which of them have been achieved so far?
Switzerland’s Energy Strategy 2050 aims for a 50% share of electricity from renewables by 2035. Recent legislation (Mantelerlass) sets targets for renewable energy, excluding hydropower, to deliver 35 TWh by 2035 and 45 TWh by 2050. While some nuclear plants have already been decommissioned, renewables (excluding hydropower) currently constitute around 10% of Swiss power production. The Mantelerlass marks a significant step forward.

What kind of program is being carried out by the state and regulatory bodies for the expansion of renewable energy in Switzerland?
Legislation such as the Energy Strategy 2050 and Mantelerlass focuses on expanding renewables. Specific programs and regulatory measures are continuously developed to drive the transition toward a sustainable and renewable energy future.

How do you see Türkiye’s renewable energy potential? In which renewable energy areas can mutual cooperation be developed between Switzerland and Türkiye?
Türkiye holds tremendous potential in wind and solar power. Collaboration opportunities between Switzerland and Türkiye, particularly in tech transfer, are promising. Joint projects can leverage each country’s strengths, with Switzerland contributing technological expertise and Türkiye offering a larger market and skilled labor force.

What services and solutions does EMPA provide?
EMPA, as the Swiss Federal Laboratories for Materials Science and Technology, specializes in application-oriented materials science. We conduct research, host demonstrators, and scale up projects, focusing on materials and technologies for a sustainable future.

Based on your experiences at EMPA, in which areas do you observe the need for innovations in the energy transition process? What kind of approach is needed to develop innovation in the energy sector?
Energy storage, energy efficiency, and CO_2 removal are key areas requiring innovation. Empa’s “mining the atmosphere” projects aim to remove CO_2 not only reduce emissions. Innovation is not only driven by research funding but also through mentorship and leadership programs, facilitating the transformation of inventions into practical solutions.

What is the role of the development of energy storage technologies in ensuring the sustainability and development of renewable energy?
Without storage you can build as many solar panels as you want, you’re not going to have the lights on at night. Storage is a crucial part of a decarbonized power grid and more efficient, more cost effective and more sustainable technologies are needed. Long-duration storage technologies are particularly important, and market regulators must establish guidelines for their valuation and compensation. Seasonal storage, using power produced in summer during the winter, is a hot topic that needs a lot more work as well.

Do you think it is possible for storage technologies to reach the potential to meet the ever-increasing energy demand in the future?
Yes, storage technologies have the potential to meet the increasing energy demand in the future. However, a diverse portfolio of technologies is necessary, considering various use cases. Open-mindedness and continued research are key to success.

What kind of technology and engineering studies are prioritized in the field of energy storage systems in Switzerland? In which types of renewable energy and in which sectors are these studies carried out intensively?
There are a lot of research activities, typically at low technology readiness levels. However, there is growing interest in energy storage in the Swiss economy and more and more products and applications are being developed. Very large scale deployments as they are found in e.g. California, however, are not found around here.

One of the issues that has been especially emphasized in the world in recent years is green hydrogen, and many countries aim to expand the role of green hydrogen in the energy pie by the 2030s. How do you see the future of green hydrogen as a form of renewable energy?
Green hydrogen is an important piece of the puzzle, but I believe its role in the energy transition has been somewhat overhyped. Hydrogen is quite difficult to transport and store, and anything beyond production at the point of use sounds very challenging to me. A great example is decarbonizing the steel industry, where hydrogen could be produced on site at the smelters and mills. But having hydrogen pipes running into every household for heating is ridiculous. For seasonal storage, chemical energy carriers (fuels such as hydrocarbons or hydrogen) remain the most promising option. Again, one technology will not solve all the issues, but Hydrogen will definitely play a big role in a diverse portfolio of technologies.

Which materials do you think will be critical in the future in the energy transition?
Critical materials include copper, essential for anything electric, and rare earths used in magnets for electric motors and catalysts for hydrogen production. These materials play key roles in advancing the energy transition.

“ACCESS TO FINANCE AND THE COST OF FINANCING WILL BE A MAJOR RISK FACTOR IN THE FIELD OF ENERGY IN 2024”

İsmail Çıldır, General Manager of Axpo Turkey, shared insights on potential developments in the field of renewable energy in 2024 and beyond, highlighting the importance of the green transition.

What do you think are the primary benefits and advantages in the transition to green energy sources or green business?
The climate crisis is forcing governments to take more stringent steps towards decarbonization day by day. Obviously, this necessitates the business world to move in this direction. In this context, I prefer to define the transition to green energy sources and green business as an inevitable necessity rather than an advantage. Of course, making this transition correctly contributes greatly to the competitiveness of companies. Green business practices have many benefits such as improved corporate image in the eyes of customers, society and investors, cost advantage created in the field of energy with energy efficiency and renewable energy applications, new business opportunities brought by green technologies, access to more and cost-effective financing opportunities with service practices to sustainability goals, improvement in employee satisfaction and loyalty. As a result, green business enables companies to position themselves strategically in accordance with the conditions of not only today but also the future, thus gaining a more sustainable and resilient structure against the uncertainties of the future.

In your speech at the forum, you focused a lot on the aspect of the energy market that is affected by the negativities in the global conjuncture and international crises, and you said that the role of energy comes first among the global inflation dynamics. Against this backdrop of uncertainty about energy and energy prices, what are the global risks to renewable energy in 2024?
Increasing world population, climate crisis, rapidly developing technology and ever-increasing uncertainties can make global economies more fragile. As a result of the negativities in the global conjuncture and international crises, global inflation may break out through the energy sector or in different sectors such as food and logistics in the coming periods. However, at the moment, energy still retains its primary role. The developments we have experienced in the past few years have resulted in a rapid increase in renewable energy investments all over the world, which is a very positive development. However, increasing inflation at the global level caused countries to implement tighter monetary policies, resulting in an increase in policy interest rates and, together with some macroeconomic measures, making access to finance difficult. In this context, access to finance and the cost of financing stand out as an important risk factor in 2024. The measures implemented by policymakers, albeit temporarily, in order to reduce the social and economic effects of the increasing energy costs due to the Russia-Ukraine War are still on the agenda as a risk for renewable energy investors. Finally, I see it as a risk that the feasibility of renewable energy investments, which gained momentum in 2023, will be negatively affected as a result of falling energy costs, meaning that the investments will not be able to continue at the same pace in 2024.

In order to ensure energy security, what should be the steps to be taken and the policies that Western countries should take in the coming period from a renewable energy perspective in order to solve their energy dependencies?
Europe has already taken crucial steps to ensure its

“I see the fact that the feasibility of renewable energy investments, which gained momentum in 2023, will be adversely affected as a result of falling energy costs, as a risk in the sense that investments will not be able to continue at the same pace in 2024.”

energy security. Reducing dependence on Russian gas, diversifying LNG terminal investments and supply sources, and continuing to grow strongly in renewable energy are extremely important developments. What I can say is valid not only for Europe but also for all countries of the world: It can be among the things that can be done to continue renewable energy investments rapidly, to obtain the base load energy need from renewable sources as much as possible by reducing the variable production due to the nature of renewable energy with storage investments, and not to neglect the grid investments that will support the rapid progress in electrification. The most important thing is for policymakers to develop policies to facilitate and accelerate investment processes. However, the economics of renewable energy currently show that investments can continue without incentives. It would be more valuable for countries to indirectly encourage renewable energy by creating financing opportunities rather than incentives. Here, it will be of great benefit to maintain two elements such as financing renewable resources under favorable conditions and making it difficult to finance fossil resources in a balanced way to support renewable energy investments.

What are the opportunities and challenges in the field of renewable energy in the context of Türkiye?
Türkiye is a dynamic market with significant opportunities in the field of renewable energy. The fact that it has a geography rich in renewable resources such as solar and wind energy shows the country's potential to become an important player in energy production. However, it offers a great opportunity for Türkiye's energy demand to increase and reduce its dependence on energy imports. However, there are some challenges in Türkiye's transition to renewable energy. Policy instability, uncertainties in the investment climate, and infrastructure deficiencies are among the obstacles facing the sector. These challenges are restricting the country's ability to fully exploit its renewable energy potential and the growth of the sector. In order for Türkiye to seize opportunities in the field of renewable energy, policy stability must be ensured, infrastructure investments must be accelerated, and an investor-friendly environment must be created. Taking these steps can help Türkiye strengthen its energy independence and have an important role to play in a sustainable energy future.

What are your fields of activity as Axpo Turkey?
Thanks to the group's pan-European experience, resources and infrastructure, we help to optimise the entire energy value chain for our 16,600 MW renewable energy customer portfolio spread across Europe, while using our experience and expertise to develop innovative energy solutions for our energy consumer customers. To contribute to the management of energy-related risks, we provide high-quality and tailor-made services to all our customers by collaborating with manufacturers, investors and intermediaries. As Axpo Turkey, we can summarize our activities with main headings such as various energy supply products, PPA, structured solutions that we call origination, wholesale energy trade and cross-border electricity trade.

With the importance of renewable energies, what do you think about the role of artificial intelligence in the energy ecosystem and the change it will bring? What will artificial intelligence change in energy?
Artificial intelligence will play an important role in the energy sector and trigger change in many areas. It will provide important opportunities to predict energy demand, increase energy efficiency and integrate renewable energy sources with data analysis and algorithms. However, it can also come with some challenges, such as data privacy and security. Considering the uninterrupted nature of energy and its operational flow that must function flawlessly in the background, I think that artificial intelligence will make significant contributions to the energy ecosystem with many facilitating applications.

"In order for Türkiye to take advantage of the opportunities in the field of renewable energy, policy stability must be ensured, infrastructure investments must be accelerated and an investor-friendly environment must be created. Taking these steps can help Türkiye strengthen its energy independence and play an important role in a sustainable energy future."

Do you think the rate of progress in energy storage technologies is sufficient?
Progress in energy storage technologies is extremely significant and happening at a rapid pace. In particular, developments in battery technologies in recent years have increased energy storage capacity and reduced costs. This enables more efficient use of renewable energy sources, accelerating the energy transition. However, more R&D and investment are still needed because energy storage technologies are critical for the energy transition to fully take place. So, while the current progress is welcome, I think more is needed.

How do you evaluate the development of energy storage technologies in Türkiye?
I think that Türkiye will be one of the countries that benefit the most from storage technology with its geopolitical position, renewable energy potential, and economy integrated with Europe. Türkiye is among the top 10 countries in Europe among the countries with the highest renewable energy usage rate in total energy needs, and the rate of renewable energy in electricity generation is above the European Union average. In an economic plane where it is inevitable to exit power plants that generate electricity from fossil sources such as coal and natural gas, where we currently meet our baseload electricity needs, it is unthinkable that Türkiye is not at the forefront of the development and application of storage technologies. Although we are still in the early stages, the record number of pre-license applications for storage electricity generation facilities also indicates that market regulators in Türkiye have taken the necessary steps and that a very rapid progress will be made in this field when a suitable investment climate is created.

"It is unthinkable that Türkiye is not at the forefront of the development and implementation of storage technologies in an economic plane where it is inevitable to exit power plants that generate electricity from fossil sources such as coal and natural gas, where we currently meet our baseload electricity needs."

“THE USE OF SYSTEMS THAT BOTH OPTIMIZE AND OPERATE AUTONOMOUSLY IS NOW BECOMING MANDATORY”

Önder Akar, CEO of smartPulse Technologies, emphasized the critical role of autonomous and optimized systems in driving the renewable energy transition, highlighting their growing necessity in the energy sector.

What are the main benefits and economic advantages of transitioning to green energy? What are the opportunities and challenges in the context of Türkiye?
The main motivation of the transformation to green energy is of course our responsibility towards nature and the world, rather than being economic. The most important step in reducing the use of fossil energy sources, which is one of the important causes of global warming, is realized with renewable energy transformation. With the widespread use of wind and solar resources, the rate at which we obtain our energy from these sources is increasing. However, the transformation should not be seen only in the field of electricity generation. With the widespread use of the type of electrical energy we call electrification (e.g. heating/cooling, electric vehicles), we are approaching the point where we can meet our other energy needs that we meet with fossil fuels with the electricity we produce with green energy. To reiterate, in the short term, the aim is to achieve the green energy transition as soon as possible rather than an economic gain. Beyond that, however, the use of natural energy resources has long term economic motivations. With green energy sources, energy dependency is significantly reduced and energy prices are getting cheaper in an environment where fuel costs are decreasing.

When we talk about energy transformation, we think of the transition from fossil fuels to renewable resources, but we naturally witness completely different transformations that accompany this change. For example, a structural shift is taking place from a centralized system to a distributed and digitized system. How do you interpret this change? What does the digital shift in energy bring?
A very correct interpretation. The management of electrical energy is quite complex and the basis of this confusion lies in the fact that electricity cannot be stored. Although electricity is a product that is produced, transmitted, distributed and consumed like many other commodities, it differs from all other products in one aspect; instant balancing requirement. In order to ensure this complex balance of electrical energy, which has to be produced as soon as it is consumed, human beings have found the solution in financial markets based on a supply chain that can be managed completely instantly. Of course, the most important leg of such a supply chain that works instantly must be correct planning. This planning activity is at the heart of the electricity markets. While the biggest variable in the design of electricity markets is the consumption side, today we are witnessing a much greater variability on the generation side (wind, solar). Moreover, these variable production sources may not consist of giant power plants as before. On the contrary, as you mentioned, it can appear in a distributed, decentralized, small consumption facility. For this reason, a great transformation is taking place in the energy markets we are accustomed to. This transformation requires a balancing mechanism that is managed more instantaneously. For this reason, software and hardware systems have gained great importance. I can say that the main factor brought by the digital change in energy will be a live energy exchange in which the consumer is more involved. While electricity markets were previously held in the form of tenders in which large players participated, today it is becoming a structure in which consumers also have a say and shape their consumption behavior according to live electricity prices. The main factor that enables this transformation is, of course, the opportunities offered by digital infrastructures.

We see that technologies such as the Internet of Things (IoT) and artificial intelligence (AI), which are called smart technologies, are among the driving forces in the field of energy as well as in other sectors. In terms of wind, solar and grid optimization, what kind of changes do you expect smart technologies to create in the energy sector?
I think we can imagine why wind and solar are so difficult to manage. Both are types of power plants whose production cannot be controlled. The market equivalent of uncontrollability is punishment. The market management has designed these plants to encourage them to make very good predictions and provide more predictable production by penalizing otherwise. In addition, when there is a lot of production from these sources, there is a situation where there is excess supply in the market and electricity prices decrease. Here are the things we need to do for these situations:

1) Estimating wind/solar production very well,
2) Manage batteries wisely, taking into account wind / solar production and price signals,
3) Ensuring intelligent shifting of consumption by looking at electricity price signals affected by wind / solar production.

We need smart technologies to do all this.

“Digital infrastructures and artificial intelligence-supported technologies are the most important elements that will ensure the most effective use of electricity in the future, where a large number of micro-manufacturing facilities are spread across the capillaries of the grid, to manage a battery optimally, to decide at which charging station and when to charge your electric car, and most importantly, to use electricity in the most effective way.”

How do digital transformation and artificial intelligence contribute to a sustainable future?
I don’t like to make a general comment on digital transformation and artificial intelligence, but in my field, namely, in the field of sustainability of electricity, it is necessary to make very complex decisions in a short time for the reasons I have just explained. Managing a battery optimally, deciding when to charge your electric car at which charging station, and most importantly, the most important elements that will ensure the most effective use of electricity in the future, where many micro-production facilities spread throughout the capillaries of the network, are exactly the digital infrastructures and artificial intelligence-supported technologies you have mentioned.

How was smartPulse founded and what needs does it solve?
Prior to my entrepreneurial career, I was working as a portfolio manager for a global energy company. During this period, I had the opportunity to observe that the renewable energy capacity was increasing rapidly and that a significant part of our business consisted of manual operations. With this observation, we established smartPulse in 2018 with the aim of ensuring that the management of electricity trading, especially renewable energy management, is carried out with smart algorithms. We can say that this need arose as electricity trade became continuous 24/7. So, if we ask why there is a continuous trade 24/7, the answer is renewable (wind and solar) power plants that need to constantly update their forecasts.

How do you integrate technology into businesses as an element that monitors the way organizations produce and use energy and enables them to optimize it commercially, and what kind of process do you carry out with your customers?
smartPulse enables an electricity trading operation to be carried out end-to-end automatically from a single platform. To give an example, in order for a wind farm to be commercially effective, it needs to receive a new forward-looking production forecast every half hour. Because it is very difficult to accurately predict the wind even for the next few hours. For this reason, you always have to make a forecast for the very near term and move forward. Day-ahead wind forecasts can deviate by about 35 percent. For this reason, the wind farm owner sometimes carries out a continuous forecasting activity by receiving forecasting services from more than one forecasting organization. Moreover, these forecasting companies demand the production of the wind farm from the owner with the same frequency, and they calibrate their forecasting algorithms accordingly. Now that we’ve created our forecast, it’s time to calculate how much our forecast deviates from our previous trading positions. It is necessary to constantly monitor our commercial positions with our forecasts and determine the need for a new commercial position accordingly. After determining this, it is now necessary to follow the electricity prices, which change hundreds of times per second, and buy/sell accordingly. This cycle, which I simply conveyed, is quite difficult to do even for a power plant, let alone for a portfolio. At this point, smartPulse offers a range of services on a single platform, ranging from monitoring Scada systems to the monitoring of power plant owners, to the integration of international forecasting organizations, to live position tracking, and then, as a final step, to automated (we can also call it algorithmic trading) trading.

What are the benefits of energy use for a business using smartPulse’s systems? More generally, how does smartPulse contribute to the expansion of renewable energy and a sustainable future?
Thanks to the automations I have just mentioned, since a renewable energy source is managed in a much more planned manner, its operational costs are significantly reduced and, most importantly, it provides a great benefit to the balancing operation in a short time, which is the most complex task for the grid operator. These dynamics contribute to the availability of more renewable energy in the grid.

In your speech at the Forum, you talked about the complexity of renewable energy management. Since renewable energy inherently carries some uncertainties, it brings some problems in generation, distribution and electricity storage. How do you address this complexity at smartPulse?
Renewable energy cannot be planned for the long term. It is necessary to constantly conduct a short-term operation.

However, this was not the case for thermal power plants. These power plants have a much larger, fewer and less instantaneous change operation. The issue in renewable power plants is that the production plan changes in a very short time. First of all, smartPulse comes into play in order to calculate this change and take action according to this change. Just like you mentioned, when a big variable such as storage comes into play, the operation becomes even more complicated. Because now it is necessary not only to take a commercial position, but also to decide whether to fill/empty the storage facility, as a result of the same equation. Here, we can say that the use of systems that both optimize and operate autonomously is now mandatory. smartPulse can meet this 100 percent with its end-to-end solutions.

With the importance of renewable energies, what do you think about the role of artificial intelligence in the energy ecosystem and the change it will bring? What will artificial intelligence change in energy?
The most important use of artificial intelligence is to improve electricity storage, electricity consumption and renewable forecasting. It is not possible for a person to do these things in a short time. This will allow us to add more renewable energy to the grid. Think of it this way, if there is not as much consumption as production at a time when the sun is very intense, you will have to store it somewhere, right? For storage, you need to foresee this situation in advance and plan the previous times accordingly. But what will you do if your storage capacity is not enough for this? You need to shift consumption. How do you know that production in terms of consumption will be so much at that moment? Hardly. For this, I think we can all guess that there should be artificial intelligence-based systems that communicate with each other and make decisions quickly.

There are some serious problems in the use of renewable energy in everyday life. For example, there are difficulties encountered in the realization of the charging and range problem of electric vehicles or the transition to renewable energy in residences due to structural problems in existing building stocks and low average income level in countries such as Türkiye. Do you think these problems can be overcome in the effort to move away from fossil fuels?
In order to overcome these, states need to produce policies and incentive mechanisms for this. Thanks to the mechanism called the Renewable Energy Support Mechanism (YEKDEM), there has been a tremendous increase in renewable capacity in our country. Of course, there needs to be much more to achieve the goals you say. The challenge here is to carry out a balanced policy that will not slow down the pace of economic development and reduce the place of fossil fuels in our lives over time.

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"The most important use of AI is to improve electricity storage, consumption, and renewable forecasting. It is not possible for a person to do these things in a short time. This will allow us to add more renewable energy to the grid."

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