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

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IICEC'S Energy Security, Clean Energy & The Role of Finance Conference Gathers Prominent Leaders

The Sabancı University Istanbul International Center for Energy and Climate (IICEC) hosted a high-level conference entitled "Energy Security, Clean Energy & The Role of Finance" on June 23rd, which featured a broad range of in-person and online participants.

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IEA Executive Director Dr. Fatih Birol Addressed World Leaders at The G7 Summit in Germany

G7 Leaders' Summit, Schloss Elmau Germany, 26-28 June 2022

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Highlights

IEA Executive Director Dr. Fatih Birol Addresses World Leaders at G7 Summit in Germany

At the G7 Summit in the Bavarian Alps of Germany from June 26-28, the leaders of the G7 countries discussed regional and global developments and endorsed critical actions for addressing these multiple problems, including how to build a more sustainable energy future through enhancing energy security and accelerating clean energy transitions. The leaders highlighted the key role and unique contributions of the International Energy Agency (IEA) to shape a more secure and clean energy future.

At the invitation of Chancellor Olaf Scholz, the current host of the G7 Presidency, Dr. Fatih Birol addressed the G7 leaders and leaders from five partner countries – Argentina, India, Indonesia, Senegal, and South Africa – as well as other high level representatives from the European Union and other international organizations.

G7 Leaders' Summit, Schloss Elmau Germany, 26-28 June 2022

The G7 leaders covered a range of critical regional and global issues during the three-day summit, including Ukraine and cooperating on foreign policy, addressing energy and food security, investing in climate and health, promoting partnerships for infrastructure and investment, and improving the global economy.

IEA Executive Director Dr. Fatih Birol addresses world leaders on the IEA's recommendations for addressing the global energy crises.

Dr. Birol shared his perspectives on global and regional energy and climate challenges and emphasized that the best response to the current energy crisis is a **massive and rapid scaling up of investment in energy efficiency, renewables, and other clean energy technologies.**

Dr. Fatih Birol

"The world does not need to choose between solving the energy security crisis and the climate crisis – we have the technologies and the policies to solve both at once." [1] Dr. Fatih Birol

[1] https://www.iea.org/news/iea-executive-director-addresses-world-leaders-at-g7-summit-in-germany

Photo: At the invitation of Chancellor Olaf Scholz, the current host of the G7 Presidency, Dr. Fatih Birol addressed the G7.

During the summit **Dr. Birol** also held bilateral meetings with many of the world leaders, including President **Joe Biden** of the United States, President **Emmanuel Macron** of France, Prime Minister **Justin Trudeau** of Canada, Prime Minister **Boris Johnson** of the United Kingdom, President **Ursula von der Leyen** of the European Commission, Prime Minister **Narendra Modi** of India, President **Joko Widodo** of Indonesia, and President **Macky Sall** of Senegal.

Dr. Fatih Birol & Joe Biden

Dr. Fatih Birol & Justin Trudeau

Boris Johnson & Dr. Fatih Birol

Emmanuel Macron & Dr. Fatih Birol

IEA's Crucial Global Role in Energy Security and Clean Energy Transitions is Emphasized in the Summit Communiqué

As global energy markets and energy-supply security are being heavily affected by recent geopolitical developments, the G7 countries showed a strong commitment to mitigate any adverse impacts and achieve a secure energy future: "We are concerned about the burden of energy price increases and energy market instability, which aggravate inequalities nationally and internationally and threaten our shared prosperity." [2]

The G7 leaders underlined the key role that the IEA plays in energy security. This includes several major focus areas including the identification of further strategies for limiting energy price increases. They showed their commitment to exploring additional measures to reduce price surges and prevent further impacts on economies and societies, both across the G7 and globally and in coordination with the IEA. The leaders of the G7 nations congratulated the IEA Executive Director Dr. Fatih Birol and the heads of other participating international organizations for their valuable contributions.

Energy and Climate Highlights from the G7 Communique:

- A reiteration of the determination to **phase out dependency on Russian energy resources,**
- **Limiting the use of Russian oil:** "Consideration of a range of approaches, including options for a possible comprehensive prohibition of all services that enable transportation of Russian seaborne crude oil and petroleum products globally, unless the oil is purchased at or below a price to be agreed in consultation with international partners," [3]
- A steadfast support for **the Paris Agreement** and its **enhanced implementation,**
- Commitment to effective adoption **of domestic climate change mitigation** measures,
- A critical role of **innovation** to achieve deep carbon reductions,
- A reaffirmed commitment to achieve the **"USD 100 billion collective climate fund mobilization objective"** through 2025,
- A reaffirmed **commitment for complete removal of ineffective fossil fuel subsidies** by 2025,
- **Speeding up the transition to sustainable energy** in order to achieve net-zero emissions by 2050,
- A reaffirmation of **a strong financial commitment to the commercial expansion of low-carbon and renewable hydrogen,**
- **Supporting partners in developing countries and emerging markets in just transitions** to clean energy.

Climate Action & A "Climate Club"

Recognizing the urgency of moving to a 1.5°C path towards climate neutrality by 2050 at the latest, the G7 leaders noted that currently neither global climate ambition nor its implementation would be sufficient to accomplish the goals of the Paris Agreement. In this context, the G7 leaders released a separate statement to kick-start a new Climate Club initiative. The G7 leaders requested assistance from the IEA, the OECD, the IMF, the World Bank, and the WTO "in line with their relevant expertise" to make the initiative a success.

The "Climate Club" aims to facilitate the efficient implementation of the Paris Agreement, accelerate climate action, and support efforts to reach "climate neutrality." The mitigation of risks associated with carbon leakage in the extraction and use of emission-intensive commodities while maintaining compliance with climate ambitions and relevant international regulations is set forth in the G7 agreement to support advanced achievements for climate security.

[2] https://www.iea.org

[3] hhttps://www.g7germany.de/resource/blob/974430/2057914/09bf78deb629910db2c445a1e7595f0b/2022-06-28-leaders-communique-data.pdf?download=1&utm_content=buffere3feb&utm_medium=social&utm_source=linkedin-Birol&utm_campaign=buffer

IICEC'S Energy Security, Clean Energy & the Role of Finance Conference Gathers Prominent Leaders

The Sabancı University Istanbul International Center for Energy and Climate (IICEC) continues to inform the public with events that it organizes on energy and climate, which are among the most important issues facing the world. This time, IICEC covered the issue of energy security, which is at the top of the global agenda and has become much more important with the Russia-Ukraine war, as well as trends in clean energy and the role of finance at the **Energy Security, Clean Energy & The Role of Finance** conference held in Istanbul.

Held at Sabancı Center with the opening speech given by the Founding Chair of Sabancı University Board of Trustees **Güler Sabancı**, the conference included speeches delivered by EBRD Türkiye Director **Arvid Tuerkner** (Guest Speaker) and IEA Executive Director and IICEC Honorary Chair **Dr. Fatih Birol** (Keynote Speaker).

The speeches were followed by a panel moderated by **Dr. Mustafa Oğuz Afacan**, Sabancı University Faculty Member. At the panel, TSKB General Manager **Murat Bilgiç**, Borusan Holding Group CEO **Erkan Kafadar**, ING Türkiye Board Member **Semra Kuran**, and SHELL Europe & Sub-Saharan Africa Vice President for Corporate Relations **Rob Sherwin** gave speeches related to the conference's theme, Energy Security, Clean Energy & The Role of Finance.

The Latest Developments in Energy Security, Clean Energy, And The Role of Finance were Evaluated at the High-Level Panel.

"We are faced with a multidimensional energy security paradigm."

Güler Sabancı:


Güler Sabancı

Starting her speech by thanking the participants and congratulating Dr. Fatih Birol, who was unanimously elected as the IEA Director for the third term in March, Güler Sabancı said: "Under the management of Dr. Fatih Birol, the International Energy Agency has become an organization that shapes 'global energy security' and leads the global clean energy transformation. Upon the invitation of the G7 Term President, German Chancellor Olaf Scholz, from here Dr. Birol will go to the G7 Leaders' Summit to make a speech to world leaders and hold bilateral talks on energy and climate. Today, we will have the privilege of listening to Fatih Birol about the latest developments and future perspectives in the field of energy and climate."

"Recently, with the global and regional developments, energy security has come to the top of the world agenda. We are faced with a multidimensional energy security paradigm that encompasses the supply chains of oil, natural gas, other fuels, electric power, and clean energy technologies.

On the other hand, we are in a period in which important steps should continue without any interruption to ensure a more sustainable future for our planet in terms of climate security and clean energy, as well as supporting social and economic development goals. A more sustainable future requires a holistic perspective that strengthens energy security and supports growth in clean energy. We need to grow with sustainable investments and financing with a focus on efficiency, competitiveness, innovative business models, and clean energy technologies."

"IICEC is a leading model and center in Türkiye."

"At Sabancı University, we have given priority to energy and climate issues for a long time. We founded IICEC as an energy and climate center with the vision that these two issues are inseparable. Within the model that I define as the Success Triangle, IICEC continues to bring together the public, private sector, and academia to create collective wisdom towards goals that will support a safer and cleaner energy future. I am very pleased to see that IICEC is expanding its cooperation and sphere of influence within the ecosystem."

"IICEC published the groundbreaking Türkiye Energy Outlook report in 2020. This study, which was adopted by the stakeholders of the sector, has become a key reference source.

Last year, IICEC published the Türkiye Electric Vehicles Outlook study, again for the first time in Türkiye. This year, within the perspective of its Outlook series, IICEC continues its studies on Renewable Energy, which is one of the most important opportunity areas in Türkiye. It further develops the Türkiye Renewable Energy Outlook study, again with a holistic and analytical perspective and with a participatory approach with the stakeholders of the sector. Creating value from science-based approaches and business collaborations has become one of the most critical success factors today. In this perspective, IICEC is a leading model and center in Türkiye."

"Türkiye has the potential to become a green hydrogen exporter in the long term."

Arvid Tuerkner:


Arvid Tuerkner:

Noting that the energy security and decarbonization agendas have become mutually supportive, EBRD Türkiye Director Arvid Tuerkner said: "Today the topic of renewable energy has become even more convincing. Increasing renewable energy capacity will free up natural gas for export and create an opportunity to transform renewable energy into green hydrogen to develop more complex products. This will ultimately help decarbonize energy-intensive industries."

"Türkiye has the potential to become a green hydrogen exporter in the long term, in addition to domestic use, to help achieve net-zero emissions in sectors that are difficult to decarbonize and to reach the net-zero target of 2053. The last decade has seen impressive growth in renewable energy production. Thanks to Türkiye's solar and wind power generation potential, we hope that we will see a further increase in this growth going forward."

"Through the Ministry of Commerce's National Green Deal Action Plan, Türkiye has announced plans to develop decarbonization roadmaps for several carbon-intensive sectors. We are currently working in partnership with the Ministry of Industry and Technology on a 2053 decarbonization roadmap for Turkish industrial sectors, which will also be the first to be impacted by the Carbon Border Adjustment Mechanism. These sectors are aluminum, cement, fertilizer, and steel."

"Additionally, the EBRD Green Cities, the Bank's flagship program and the largest financing framework ever, has been expanded to reach a total of ğ5 billion. Four cities – Ankara, Gaziantep, Istanbul, and Izmir – joined the program following green investment projects ranging from clean urban transportation to renewable energy generation for municipal uses. We also help small and medium-sized businesses and homeowners invest in green technologies through our Green Economy Financing Programs, our Green Economy Financing Facility (GEFF). Through the EBRD's programs in Türkiye, TurSEFF (Türkiye Sustainable Energy Financing Program), MidSEFF (Türkiye Medium-Scale Sustainable Energy Financing Program), and TuREEFF (Turkish Housing Energy Efficiency Financing Program), 2 billion Euros were invested in projects in Türkiye. The EBRD also announced a new 500 million Euro framework this year under the name of GEFF Türkiye, and the first loan transactions have already occurred."

"This crisis could be a turning point for the energy world."

Dr. Fatih Birol:


Dr. Fatih Birol

Dr. Birol thanks to the vision of Güler Sabancı that IICEC is 12 years old and carries out studies as a guide to such important issues, Dr. Fatih Birol continued: "With the invasion of Ukraine by Russia on February 24, the world began to experience its first global energy crisis. We are currently in the middle of the first global energy crisis. It does not seem possible for the world to get out of this energy crisis in a short time. This energy crisis brings along other crises, especially food crises. Besides, we are experiencing a humanitarian crisis in Ukraine."

"We had oil crises in the 1970s, but then there was only the oil crisis. Now we are faced with serious problems with oil, natural gas, coal, and electricity. If we look at those oil crises, there was a very serious increase in inflation. Now we can see this again. The second thing is recession. I think we are slowly getting there now. But the oil crisis of the 1970s didn't just cause recessions and inflation; new issues such as energy savings and energy security came to the fore. It was a reaction that suddenly changed the entire automotive industry. The second reaction developed by countries against the oil shocks was the nuclear industry. Of the nuclear power plants currently in use around the world, 40% were established in response to those energy crises. I say this because we have had very difficult days due to the crisis, and I think we

will have more difficult days ahead. I see that there will be a reaction like the reaction to the crises in the 1970s. We are leading this. That's why I think this crisis could be a turning point in the energy world."

"We prepared a 10-point action plan for Europe and shared it with leaders."

"If we look at the markets, oil prices are over $100 and are significantly contributing to inflation. One of my concerns is that the situation could become more serious as summer approaches. That's because demand for oil typically starts to rise as we approach the summer months. If the producing countries in the Middle East put the oil they currently have in their stocks on the market and increase production, this will create relief in prices. However, if there is no serious weakening in the economy and oil-producing countries do not take new steps, Europe may face a very serious problem."

"Currently, the stocks available to European countries are at an extremely low level. That's why we prepared a 10-point action plan for Europe and shared it with European leaders. Many countries, including Germany, are implementing certain parts of this plan. What are these actions? Reducing the natural gas heating thermometer in homes by one or two degrees. According to our calculations, if we heat homes in Europe by two degrees less, the amount of gas we will save will be equal to the gas coming to Europe via Russia's largest pipeline. In our letter to European governments a month ago, we explained the countries' gas distribution restriction plan to be carried out in an emergency. Programs to restrict gas shipments need to be drawn up on a regular basis. Meanwhile, while Europe is taking these steps to reduce natural gas imported from Russia, Russia may cut off all natural gas. Such a possibility, I think, is on the table."

"Decisions to be taken in the energy crisis should not put a crimp on the fight against the climate crisis."

"The current situation of these markets is not encouraging. Now there is another crisis, the climate crisis, for which 80% of the emissions that are causing it come from the energy sector. In some countries, we see that fossil energy investments may come as a serious wave in some sectors as a response to the current situation. Therefore, the decisions we will take in the energy crisis should not put a crimp on our fight against the climate crisis. While we want to bring energy security under control, we should not make the climate crisis worse."

"We see growth of 12 percent in clean energy investments in 2022."

"For the first time in 2022, we see significant growth of up to 12 percent in clean energy investments. In addition, there is good news about electric cars. In 2019, two out of every 100 cars sold in the world were electric cars. Our expectation this year is that 15 out of every hundred cars will be electric cars. In other words, an increase from 2% to 15%."

"The world is already returning to nuclear energy."

Answering a question about the increase in demand for nuclear energy, Dr. Fatih Birol emphasized that there has been a comeback for nuclear energy in the recent period and said: "I observe that the interest in nuclear energy has increased very seriously everywhere after the invasion of Ukraine. We have suggested to the governments of Belgium, Germany, and Japan that they consider putting nuclear back on the agenda because circumstances demand it. First, energy security. Second, the increase in natural gas prices. It would be extremely optimistic to expect natural gas prices to decrease in the near term. Third, the share of renewable energy in the world will gradually increase. When renewable energy increases, you need an option such as nuclear to provide a certain security in systems and networks. The world is already returning to nuclear energy. Many European countries, especially the UK, United States, and France, are giving the lion's share to nuclear in their new energy strategies. However, the development of a new technology called the small modular reactor, which speeds up the construction process, is progressing. These are technologies that are much more flexible, built very quickly, and can be put into operation immediately. These are not yet commercialized, but many are working on it. I think in the next five or six years these will become commercial, by 2030."

Important Messages from Banking and Industry Leaders at the High-Level Panel

Following the speeches, IICEC's conference continued with a high-level panel, during which distinguished business leaders assessed the latest developments.

The panel was moderated by **Dr. Mustafa Oğuz Afacan**, Sabancı University Faculty Member, and featured TSKB General Manager **Murat Bilgiç**, Borusan Holding Group CEO **Erkan Kafadar**, ING Türkiye Board Member **Semra Kuran**, and SHELL Europe & Sub-Saharan Africa Vice President for Corporate Relations **Rob Sherwin**, all of whom touched upon the core areas within the perspective of the Conference title: Energy Security, Clean Energy & The Role of Finance. IICEC summarized significant messages below:

"We contribute to the reduction of approximately 16 million tons of CO_2 emissions annually."

Murat Bilgiç:


Murat Bilgiç

TSKB General Manager Murat Bilgiç: "Since 2002, we have continued to support projects realized in the field of renewable energy in Türkiye. Energy projects such as hydroelectric power plants, solar, wind, biomass, and geothermal power plants, which we financed, represent 15% of Türkiye's total installed renewable energy power. At TSKB, we contribute to the reduction of approximately 16 million tons of CO_2 emissions annually with the financing that we provide for renewable energy and energy efficiency projects."

"In order for Türkiye to realize its significant renewable energy potential, we believe that the development of the sector should be supported with green bonds, public offerings, and new financing methods, as well as investment loans. Therefore, at TSKB, we will continue to support renewable energy investments, which will be realized through new facility investments and capacity increases, with all our business lines, as part of Türkiye's energy policy. We strive to enrich our funding sources, financing models, and consultancy services with new ESG-focused initiatives. We have an SDG-related financing target of 8 billion USD by 2030. We aim to maintain the ratio of these loans at 90% between 2021-2025."

"Global climate change and energy crisis have accelerated the transition to green energy."

Erkan Kafadar:


Erkan Kafadar

Borusan Holding CEO Erkan Kafadar: "The climate change and the energy crisis we are experiencing have accelerated the transformation to green energy and the green economy all over the world. Ensuring energy-supply security and investing in renewable energy-oriented supply are the main axes of this transformation. Energy policies planned in coordination with economic development and a more predictable free market are of great importance for this transformation."

"Within the scope of the strategy to be clarified in this framework, the establishment of the infrastructure for the required connection capacity together with the increased system flexibility will ensure the integration of more renewable energy capacity into the grid. Developing regulations for facilitating licensing processes and access to favorable financing conditions will constitute important steps in improving the investment climate. I believe that the publication of the Climate Law within the 2053 Net Zero Emissions Target, the completion of the Green Deal Action Plan, and the establishment of the Emissions Trading System (ETS) will accelerate this transformation process. The development of our human resources, who will carry out all these processes, and the supplier ecosystem is an indispensable part of this transformation."

"The finance sector has started to take the necessary steps for renewable energy."

Semra Kuran:


Semra Kuran

ING Türkiye Board Member Semra Kuran: "The energy sector is one of the most important tools for combating climate change and having a sustainable economy. As governments, companies, and institutions, it is critical that we all move towards a common goal. Everyone needs to invest in this journey. In this context, it will be very important for the financial services sector to encourage and support its customers' investments in the transition to the 'green' area by providing access to additional capital and financing under favorable conditions. For this reason, it is of great importance that the finance sector examines and reports on all sectors in terms of clean energy. At this point, not only financial support but also consultancy to companies in need is critical in terms of providing sustainability financing from international institutions."

"We see that institutions in the finance sector have started to take the necessary steps for renewable energy. As one of the early starters, we at the ING Group announced that we aim to increase our financing of renewable energy by 50% by the end of 2025. At ING Türkiye, we will continue to transfer our international experience to our country, expand our product range, and work towards a sustainable world."

"The war in Ukraine showed the importance of diversifying energy supply."

Rob Sherwin:

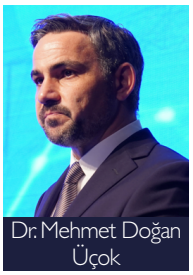

Rob Sherwin

SHELL Europe & Sub-Saharan Africa Vice President for Corporate Relations Rob Sherwin said: "While the war in Ukraine is a human tragedy, it showed us all the importance of diversifying energy supplies. The world continues to need more and cleaner energy. For this reason, at Shell, we continue our 'Powering Progress' strategy, which we have put forward with the aim of helping our customers decarbonize."

"Beyond that, incentives such as the support of many governments for renewable energy to reduce dependency on imported fossil fuels will accelerate the steps we take in this direction. However, as we move towards a world with net-zero carbon emissions, the vital role of oil and gas continues in all scenarios, especially for the continuity of the sectors that are most difficult to decarbonize."

"IICEC Conferences address the critical topics in energy and climate."

Dr. Mehmet Doğan Üçok:


Dr. Mehmet Doğan Üçok

"Within the global conjuncture today, energy security, clean energy, and the role of finance are considered as key themes. Before diving into these themes, let's look at recent history. The 1973-74 oil crisis caused global players to understand the risks of the dependence on foreign resources. That crisis was a milestone in energy security, as most of the OECD members had to take measures to be prepared for potential supply shocks. Oil prices increased by almost fourfold back in those days, leading to an increase also in production costs, producing a negative impact on the economies all over the world, and triggering inflation and stagnation, which the result being stagflation. Secondly, clean energy transformation is one of the themes of our conference today, regarding the "Net-Zero Emission" as coined by the International Energy Agency. Therefore, we must consider the proper cost of transition. Hence, we need a productive and effective financing infrastructure, as we will be discussing today, especially within the theme of the role of finance."

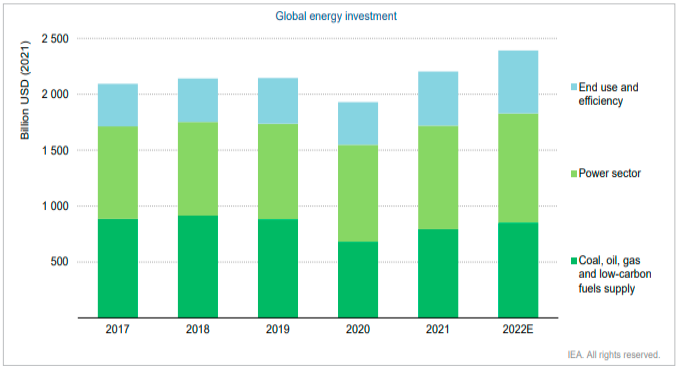
To watch the conference in Turkish:
https://www.youtube.com/watch?v=R3H4-gapWgE

For English Version (Simultaneous Translation):
https://www.youtube.com/watch?v=epWCu9OMwzs

World Energy Investment 2022

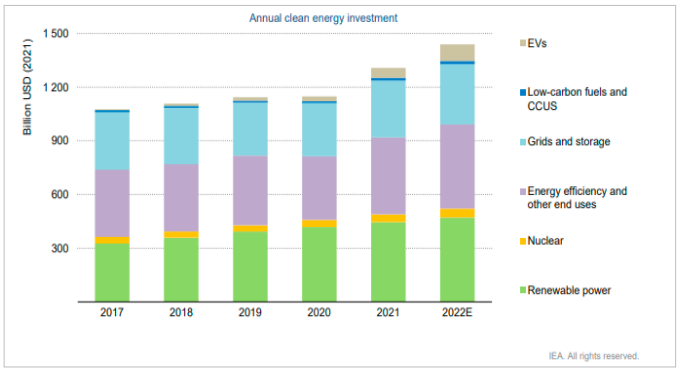
After remaining stagnant for several years, worldwide spending in clean energy is ramping up, mainly driven by renewables and energy efficiency. Other clean energy areas also show a growing trend, but "today's levels of capital spending are still far from sufficient to tackle the energy and climate crises," according to the IEA's recent Energy Investment 2022 Report. [4] Global energy investment is set to increase by 8% in 2022 and reach USD 2.4 trillion, with the anticipated increase stemming notably from clean energy (Figure 1 and Figure 2).

Figure 1. *Annual Global Energy Investment (2017-2022E, billion 2021USD$)*



Source: *IEA, 2022*

Figure 2. *Annual Clean Energy Investment (2017-2022E, billion 2021USD$)*



Source: *IEA, 2022*

What are the leading clean energy investment areas?

- The power sector remains the major growth avenue for clean energy spending. Renewables, power grids, and energy storage represent over 80% of total power sector investment.
- Solar PV represents nearly half of new investment in renewables-based power generation.
- Energy efficiency advancements are another key growth area, driven by higher fuel prices and government incentives. The buildings efficiency investment worldwide showed a strong growth with an increase of 16% in 2021.

Is spending on clean energy technologies on track to support energy security and clean energy objectives?

- Spending on solar PV, batteries, and electric vehicles is growing at rates consistent with reaching global net-zero emissions by 2050.
- Battery-storage investments show a strong growth to more than double year-over-year to reach almost $20 billion in 2022.
- There is also rapid growth in investment into some emerging technologies in addition to battery storage, notably low-emissions hydrogen and carbon capture utilization and storage (CCUS).
- However, the overall investment in clean energy remains less than what is needed for a more clean and secure energy future.

Any regional variations?

- Most clean energy investments take place in advanced economies and China. In some energy markets, recent energy-supply security developments and associated concerns coupled with high energy prices are prompting more investment in fossil-fuels based supply, especially in coal.

For further reading:

https://www.iea.org/reports/world-energy-investment-2022

[4] https://www.iea.org/reports/world-energy-investment-2022

Bonn Climate Change Conference Makes Progress but Much Work Remains [5]

The Climate Change Conference in Bonn is drawing to a close after two weeks of rigorous work to achieve progress on major technical problems and prepare resolutions for the adoption at the United Nations Climate Change Conference (COP27) at Sharm el-Sheikh in Egypt in November.

To assess collective progress towards meeting the Paris Agreement's aim of limiting global warming to 1.5 degrees Celsius, delegates to the conference engaged in the first technical conversation of the "Global Stocktake." [6]

During the conference, the UN Climate Change Executive Secretary Patricia Espinosa said: "While much work remains, parties have made progress in several technical areas here in Bonn. Such steps are a key part of negotiations and important to achieve our overall goals. The world is moving closer to an overall shift towards implementation of the Paris Agreement. [7] Major political decisions, notably on finance for loss and damage, need to be taken at COP27. We now need to ensure that Sharm el-Sheikh will truly be the place where the important promises of the Paris Agreement are turned into reality." [8]

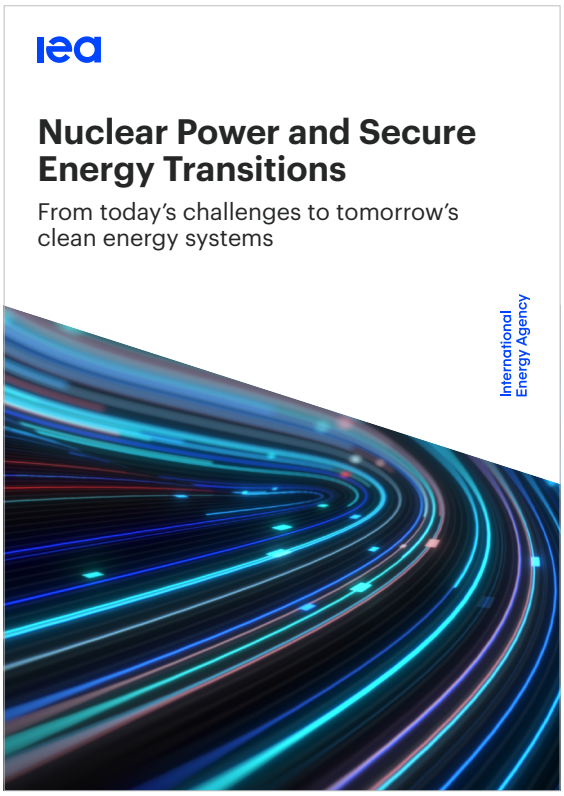
Marianne Karlsen, the Chair of the Subsidiary Body for Implementation (SBI) said: "The Global Stocktake and other discussions at the Bonn Climate Conference have demonstrated the many gaps that exist in climate action, but also the opportunities. I am heartened that governments and numerous stakeholders have been show casing solutions, opportunities, innovations, and best practices from throughout the world. And we have seen unprecedented engagement on the part of non-Party stakeholders who have a key role to play in helping governments achieve their climate goals." [9]

Following the approval of the Glasgow Climate Pact at COP26 last year,[10] the Bonn Climate Change Conference was the first occasion for all UNFCCC Parties to gather since that time. Last year, a wide range of critical themes were discussed during COP26, including the need for more ambitious climate action, greater cuts in greenhouse gas emissions, increased resilience to the consequences of climate change, and financial help for developing nations.

It is stated that climate change's unavoidable effects, such as more frequent and extreme heatwaves, floods, and storms, as well as the need for financial support, are still some of the most pressing concerns that need to be addressed. On the other hand, significant effort has been initiated on urgently the ramping up of mitigation ambition and implementation. The United Nations Climate Change Conference, often known as COP27, will be held at Sharm el-Sheikh, Egypt, from November 6-18.

[5] https://unfccc.int/news/bonn-climate-change-conference-makes-progress-in-several-technical-areas-but-much-work-remains
[6] https://unfccc.int/news/global-stocktake-a-critical-lever-for-ambitious-climate-ction
[7] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
[8] https://unfccc.int/news/bonn-climate-change-conference-makes-progress-in-several-technical-areas-but-much-work-remains
[9] https://unfccc.int/process-and-meetings/the-paris-agreement/the-glasgow-climate-pact-key-outcomes-from-cop26
[10] https://unfccc.int/news/bonn-climate-change-conference-makes-progress-in-several-technical-areas-but-much-work-remains

Nuclear Power and Secure Energy Transitions



The International Energy Agency's (IEA) latest report, Nuclear Power and Secure Energy Transitions: From Today's Challenges to Tomorrow's Clean Energy Systems,[11] examines how nuclear energy might assist in addressing the two main crises confronting the world today: energy and climate.

According to the report, nuclear investment, particularly in advanced nations, faces significant challenges due to the cost, performance, safety, and handling of nuclear waste. The report looks at the added challenge of meeting net-zero goals with less nuclear power than the IEA Net Zero Roadmap calls for. It also looks at what kinds of cost goals could help nuclear power play a bigger role in energy transitions.

The report builds on the IEA's groundbreaking 2021 study, Net Zero By 2050: A Roadmap for the Global Energy Sector [12] and the way it accomplishes this is by examining in great detail the possible role of nuclear power as a source of on-demand, low-emission electricity that can supplement the leading role of renewables like wind and solar in the transition to net-zero-emissions electric systems.

The report outlines the possible policy, regulatory, and market reforms that may be adopted to generate new investment possibilities for countries in which nuclear power is regarded an acceptable element of the future energy mix. In addition, the report examines emerging technologies, such as small modular reactors (SMRs) and their prospective development and implementation.

It is noted that nuclear power has the potential to play a significant role in facilitating safe transitions to low-emissions energy systems and thus building energy systems that are both sustainable and clean will be more difficult, risky, and costly if nuclear power is not an option. A continued or increased use of nuclear power can minimize the need for imported fossil fuels, lower carbon dioxide emissions, and allow energy grids to include more solar and wind power.

"In today's context of the global energy crisis, skyrocketing fossil fuel prices, energy security challenges, and ambitious climate commitments, I believe nuclear power has a unique opportunity to stage a comeback. However, a new era for nuclear power is by no means guaranteed. It will depend on governments putting in place robust policies to ensure safe and sustainable operation of nuclear plants for years to come – and to mobilize the necessary investments including in new technologies. And the nuclear industry must quickly address the issues of cost overruns and project delays that have bedeviled the construction of new plants in advanced economies. As a result, advanced economies have lost market leadership, as 27 out of 31 reactors that started constructed since 2017 are Russian or Chinese designs,"[13] said IEA Executive Director Dr. Fatih Birol.

[11] https://www.iea.org/reports/nuclear-power-and-secure-energy-transitions
[12] https://www.iea.org/reports/net-zero-by-2050
[13] https://www.iea.org/news/nuclear-power-can-play-a-major-role-in-enabling-secure-transitions-to-low-emissions-energy-systems

Policy Recommendations

The following recommendations detailed in the report are intended for decision-makers in countries that are optimistic about the prospects of nuclear power.

- **Extending plant lifetimes**

  Existing nuclear power reactors should be given permission to run for longer periods of time if necessary.

- **Making electricity markets value dispatchable low emissions capacity**

  Design energy markets to guarantee that nuclear power facilities are rewarded in a competitive and non-discriminatory way.

- **Creating financing frameworks to support new reactors**

  Improve the efficiency of new plant construction by setting up risk management and finance plans that are both efficient and affordable.

- **Promoting efficient and effective safety regulation**

  It is imperative that safety authorities have the necessary resources and expertise to conduct timely evaluations of new projects and designs.

- **Implementing solutions for nuclear waste disposal**

  Include citizens in the decision-making process about the approval and building of high-level waste-disposal facilities.

- **Accelerating the development and deployment of small modular reactors**

  Consider using SMRs as a low-emissions, cost-effective sources of power.

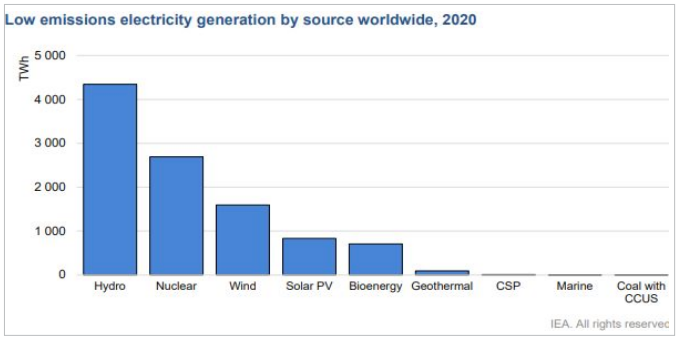
- **Re-evaluating plans according to performance**

  Make long-term funding reliant on the sector delivering safe projects on time and on budget.

Nuclear power continues to a major source of clean electricity. In 2020, nuclear power generated around 10% of the world's total electricity. Although its share decreased in the late 1990s, nuclear power remains the second-largest source of low-emissions electricity after hydropower, and the major source in advanced economies (Figure 3)

By the end of 2021, there were a total of 439 nuclear power reactors in operation across 32 countries, with a capacity of 413 GW. Most of that capacity came from developed countries, with about 270 GW of capacity.

Figure 3. *Low-Emissions Electricity Generation by Source Worldwide (2020, TWh)*

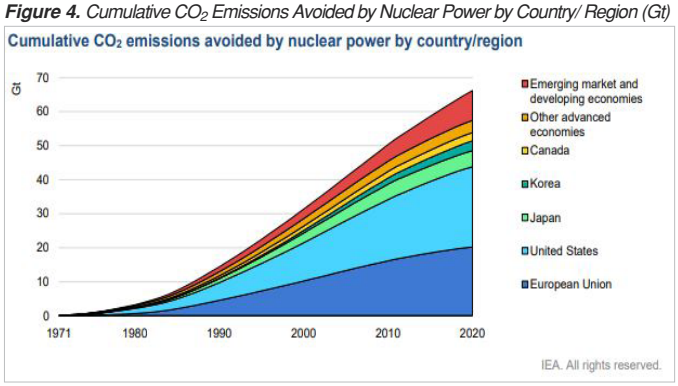


Source: *IEA, 2022*

Since the 1970s, nuclear power has played a significant role in reducing CO_2 emissions across the world. It is estimated that the world averted the emission of approximately 66 Gt of CO_2 between 1971 and 2020 (Figure 4). During that time span, total electricity-generating emissions would have risen by roughly 20%, and the total energy-related emissions would have risen by 6%.

Most of the averted emissions came from developed economies, which accounted for over 85% of the total: the European Union avoided 20 Gt, or 40% of its total power-generating emissions, while the United States avoided 24 Gt, or 25% of its total emissions (Figure 4).

Figure 4. *Cumulative CO_2 Emissions Avoided by Nuclear Power by Country/ Region (Gt)*



Source: *IEA, 2022*

The momentum behind small modular reactors (SMRs) is increasing

SMRs could play a role in attaining net zero targets by integrating with variable renewables and other low-emissions technologies. There is an increased willingness on the part of governments to examine and promote technology solutions due to pressure from the net zero challenge and heightened concerns about power-supply security. [14]

The report noted that it is difficult to make accurate projections regarding the future role that SMR technology will play in the process of decarbonizing the energy system because of the unpredictability surrounding the timing of its readiness for deployment on a commercial scale. With sustained advances in technology development and demonstration, as well as reduced prices from now through 2030, the report anticipates that SMR-powered reactors will make up an increasing share of future nuclear-capacity increases.

[14] "Small modular reactors (SMRs) are advanced nuclear reactors that have a power capacity of up to 300 MW(e) per unit, which is about one-third of the generating capacity of traditional nuclear power reactors." https://www.iaea.org/newscenter/news/what-are-small-modular-reactors-smrs

Türkiye Will Announce the Country Roadmap for Hydrogen

Photo Source: Anadolu Ajansı, 2022

Addressing the 23rd World Hydrogen Energy Conference in Istanbul, Energy and Natural Resources Minister Fatih Dönmez discussed the current state of work regarding a comprehensive national strategy document for hydrogen.

The minister emphasized that this strategy document, soon to be announced, includes 50 actions under five areas from production to the final use of hydrogen along a promising value chain.

Türkiye has already announced hydrogen as one of the key growth avenues towards a more sustainable energy future that aims at a carbon-neutral structure with lowered energy imports.

- The minister emphasized that hydrogen production would be fostered based on Türkiye's renewable energy and coal resources together with critical R&D and deployment activities along these lines.
- Minister Dönmez also reiterated the importance of blending hydrogen into the natural gas grid as one of the major aspects of Türkiye's hydrogen-related objectives.
- This would be a key contributor in recent efforts to reduce dependency on fossil fuels, especially those tied to the fossil fuel imports that meet the demand for heating.
- The Minister also underlined Türkiye's goal to export hydrogen to consuming markets.

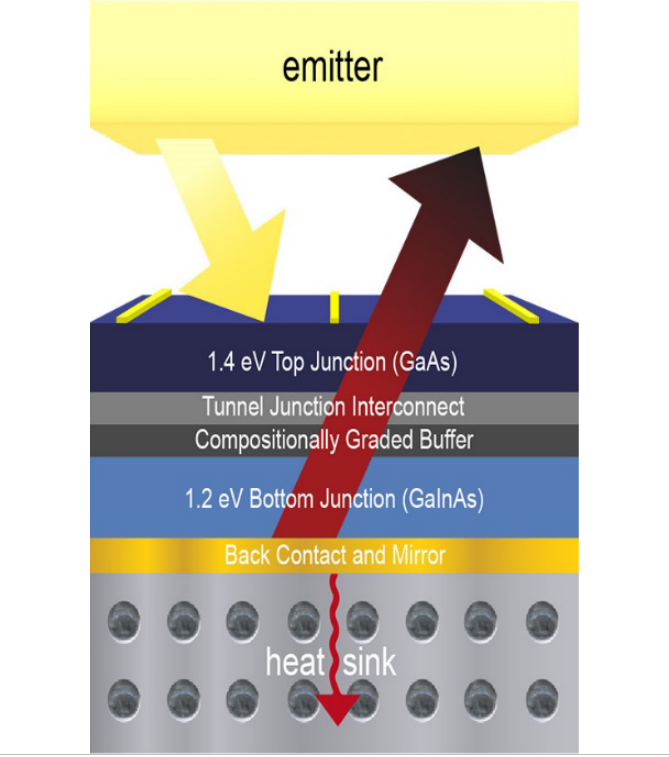
Efficiency Record in the TPV Cell Technology

A recent breakthrough in thermos photovoltaic (TPV) cell technology can provide multiple benefits for clean energy transitions. Developed through a joint effort by MIT and the National Renewable Energy Laboratory, the technology can convert heat to electricity with over 40% efficiency, a more efficient conversion process than for conventional steam turbines.[15]

A major advantage of TPV cells is their ability to perform with heat sources above 2,000°C. The research thus envisions a plan to integrate TPV cells into grid-scale thermal batteries, which can benefit from operating at high temperatures and absorb excess energy from renewable energy by utilizing hot graphite insulation. TPV cells would then convert the heat into electricity, which can be dispatched into the power system as required.

The researchers noted that the technology can provide other advantages including faster response times and compatibility with a flexible range of system sizes from kilowatts to megawatts. Lower maintenance costs are another benefit due to fewer moving parts. The record-breaking TPV is a photovoltaic device with two light-absorbing layers placed and optimized to absorb different wavelengths of light.[16]

Figure 5. *Schematic Representation of the TPV Cell*



Source: *NREL, 2022*

[15] https://www.technologyreview.com/2022/06/29/1053177/a-better-heat-engine/

[16] https://www.nrel.gov/news/program/2022/capturing-light-from-heat-at-40-percent-efficiency-nrel-makes-big-strides-in-thermophotovoltaics.html

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