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REPORT*

"Towards a Greener Future: Cooperation for Technology Solutions in the Black Sea Region"

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I INTRODUCTION

1. The global transition to a greener future grounded in the principles of a low-carbon economy and sustainable use of natural resources is becoming an imperative of modern life. The pressing global challenges of climate change, depletion of natural resources, and environmental pollution pose significant obstacles to achieving a sustainable future for the planet. The urgency of these issues necessitates a collective response from the world community, recognizing that immediate and transformative actions are required. This process encompasses various measures and strategies designed to mitigate the impacts of climate change while fostering a sustainable and environmentally friendly economy. At the forefront of this transformation are green technologies - innovative solutions specifically aimed at reducing the anthropogenic impact on the environment. Proper implementation of green technologies is a crucial step towards achieving a sustainable and prosperous future where the economy successfully coexists with environmental sustainability.

2. It should be noted that the recent announcement by the USA, which is one of the largest greenhouse gas emitters and an influential player in global politics, to withdraw from the Paris Agreement on climate and its decision against the green agenda sets a precedent that may weaken the resolve of other nations to commit to their climate goals. This development may lead to a fragmented approach to climate policy, where individual countries prioritize short-term economic gains over long-term sustainability. However, despite the geopolitical shifts, the urgency of environmental issues remains. Climate change, biodiversity loss, and ecosystem degradation continue to threaten economies, public health, and social stability. It is imperative to enhance the engagement of all stakeholders - governments, businesses, NGOs, and citizens in environmental protection efforts through local, national and global initiatives with the aim to create a more resilient framework for sustainability. To this end, the transfer and development of green technologies and adoption of technological solutions are vital for achieving sustainability goals.

3. The Wider Black Sea Region holds significant strategic importance in both ecological and economic terms. Its abundant fossil fuel reserves, coupled with vast potential for renewable energy resources position it as a crucial player in the transition to sustainable energy systems. The path toward a greener future is filled with challenges, but it also presents opportunities for innovation, collaboration, and growth. By prioritizing collective action and embracing sustainable practices the BSEC Member States can work with dedication and resolve towards mitigating the impacts of climate change and constructing a greener future.

4. The Parliamentary Assembly of the Black Sea Economic Cooperation has placed a special emphasis on the transition to a green future in the previous period and adopted the Report and the Recommendation 196/2024 on "Cooperation among the BSEC Member States in Energy Trading", the Report and the Recommendation 191/2023 on "The Role of Parliaments in Enhancing Energy Security in the BSEC Member States", the Report and the Recommendation 167/2019 on "Green Economy. Blue Growth", the Report and the Recommendation 155/2017 on "Development of New and Renewable Sources of Energy in the BSEC Member States", the Report and the Recommendation 134/2013 "Global Climate Change: Causes, Effects and Possible Consequences for the BSEC Member States", the Report and the Recommendation 113/2009 on "Shaping Ecological Awareness and Behaviour in the BSEC Member States", the Report and the Recommendation 99/2007 on "Global Climate Change: Consequences for the BSEC Member States", the Report and the Recommendation 91/2006 on "Alternative Energy Resources and their possible application in the Black Sea region", the Report and the Recommendation 81/2005 on "Economic Aspects of Resolving Environmental Problems in the Black Sea Countries", the Report and the Recommendation 49/2001 on "Black Sea

Environmental Protection: New Challenges", the Report and the Recommendation 5/1994 on "Black Sea Environmental Health", etc.

5. The present Report uses the information received from the national delegations of the Republic of Albania, the Republic of Azerbaijan, the Republic of Bulgaria, the Hellenic Republic, the Republic of Moldova, Romania, the Republic of Serbia and the Republic of Türkiye. It also has benefited from the valuable contribution of the BSEC Permanent International Secretariat. The reference material was obtained from the official websites of the World Bank, the European Union (EU), the United Nations Conference on Trade and Development (UNCTAD), United Nations Environment Programme (UNEP), the International Energy Agency (IEA), the International Renewable Energy Agency (IRENA), the World Economic Forum, the World Meteorological Organization (WMO) and other relevant international and regional organizations.

II GREEN TRANSITION ENDEAVOURS AND TECHNOLOGY SOLUTIONS

6. Building a greener future necessitates a comprehensive transition to sustainable development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This transition is not just about adopting new technologies but also involves reevaluating existing practices, policies, and societal values. A holistic approach integrates ecological, social, and economic dimensions, ensuring that sustainable development is inclusive and equitable. The path toward a greener future is multifaceted, requiring collaboration across all levels, from governments and businesses to individuals and communities. By embracing sustainable practices, adopting innovative technologies, and fostering public involvement, it is possible to build a resilient future and promote green practices and green technologies.

7. Environment condition is alarming today. One of the significant challenges to both environmental sustainability and economic well-being is population growth. As the global population continues to rise, the demand for essential resources such as land, water, and energy intensifies, leading to critical issues like resource depletion, water scarcity, food security, increased energy demand, climate change, etc. According to the World Meteorological Organization (WMO), 2024 was the warmest year on record. The World Economic Forum has estimated that the global cost of climate change damage will amount to 1.7 trillion USD-3.1 trillion USD annually by 2050, including the cost of damage to infrastructure, property, agriculture, and human health. Addressing the pressing environmental challenges posed by population growth requires a multifaceted approach that balances human needs with environmental protection. By prioritizing sustainability, investing in green technology, and promoting education, it is possible to accommodate the needs of present generation, but also preserve resources for future generations, while safeguarding health of the planet.

8. Climate change caused by human produced emissions of greenhouse gases (GHGs) is among the most urgent environmental challenges. The need to reduce GHGs emissions has been widely accepted, reflected in ambitious global and national goals. Attainment of tangible results requires implementing the energy, climate and environmental transitions, as well as ensuring that all industries and sectors lessen the environmental effects through more efficient use of resources, substituting fossil fuels with renewable energy sources, and reducing risks to the environment, climate and people. It is necessary to ensure participation of stakeholders at all levels, including individuals, communities, organizations, countries, local governments, legislators, etc.

9. Technological innovations play an important role towards cleaner energy, especially given the fact that the energy sector is the source of around three-quarters of greenhouse gas

emissions. Low-carbon solutions, decarbonising the energy systems, phasing out fossil fuels and replacing them with clean energy, energy efficiency are the key objectives in the energy transition. Countries stimulate investment in solar and wind energy, hydropower, geothermal energy and biomass to diversify energy mix and reduce emissions. According to the International Energy Agency (IEA) forecasts, renewable energy consumption in the power, heat and transport sectors is expected to increase near 60 percent over 2024-2030 period. Global investment in clean energy has increased by since 2020, reaching an estimated 2 trillion USD in 2024. Considerable advancement is being made in decarbonising the electricity sector, especially with the growth of the renewable electricity technologies, meaning solar and wind power. Due to the introduction of new approaches and the use of modern technical solutions, as well as ongoing research, investment and continued support from countries, there is a decrease in the cost of construction and operation of renewable energy facilities.

10. New technologies play a pivotal role in addressing the challenges of resource exhaustion and environmental degradation while promoting economic growth. Green technological solutions not only minimize the ecological footprint but also offer innovative pathways to enhance productivity and sustainability across various sectors. According to the UN Conference on Trade and Development Technology and Innovation Report 2023, the frontier technologies refer to quickly developing solutions that take advantage of digitalization and connectivity and encompass three broad groups: Industry 4.0 (artificial intelligence, Internet of things, big data, blockchain, 5G, 3D printing, robotics, drone technology), green and renewable energy technologies (solar photovoltaic, concentrated solar power, biofuels, biogas and biomass, wind energy, green hydrogen, electric vehicles) and other frontier technologies (such as nano technology and gene editing). Global investment in clean technology production that reached 235 billion USD in 2023 demonstrates the growing attention to addressing environmental issues and ensuring sustainable development. By fostering innovation and sustainable practices, societies can work towards a greener future that aligns with the goals of the 2030 Agenda for Sustainable Development.

11. The shift towards renewable energy sources such as solar, wind, hydroelectric, and geothermal is fundamental in reducing greenhouse gas emissions. These technologies harness natural resources that are abundant and inexhaustible. While these energy sources are crucial for minimizing pollution, their output is heavily influenced by weather conditions and climate variability. Extreme climate conditions such as intense sunlight, hailstorms, hurricanes, wildfires, drought and floods can affect the green energy supply. For example, wind turbines depend on a certain wind speed, they cannot operate when the wind speed is too low, and the turbines automatically turn off when the winds are too strong, which can also lead to periods when energy production is significantly reduced. However, these challenges can be addressed by bringing advanced technological solutions that maintain consistent energy production, storage, management and protect infrastructure. The development of storage technologies such as batteries and pumped storage plants plays an important role in mitigating variability issues and allow excess energy to be stored when conditions are ideal and used during periods of low production. The use of mixed solutions, where renewable sources complement each other, is also necessary. The implementation of advanced innovative solutions for the storage, integration and management of renewable energy significantly increases their reliability, contributing to a sustainable energy future.

12. Improvement in energy efficiency through innovative technologies leads to substantial reductions in energy consumption. Implementing green technologies in resource management involves optimizing the use of materials and energy. Smart grids, energy-efficient appliances, and industrial processes reduce the use of energy resources and consumer expenditures.

Integrating renewable energy sources into energy systems also helps reduce overall fossil fuel consumption and carbon emissions. However, it is noteworthy to accentuate that the global processes of green transition and the continued reliance on fossil fuels are developing in parallel. Today the oil and gas sectors provide more than half of global energy supply, while fossil fuels still account for around 35 percent of total energy use in buildings and 95 percent in transport. According to the latest IEA projections, global demand for oil and gas will reach the peak by 2030. Currently 800 billion USD are invested in the oil and gas sectors annually. Major fossil fuel producers recognize that the transition to a low-carbon economy is inevitable and are exploring strategies to balance their ongoing extraction activities with investments in renewable energy. This creates a complex dynamic in which companies and governments seek to balance energy security with the need to reduce their carbon footprint. Ultimately, the transition to a sustainable energy system is a multifaceted challenge that requires an integrated approach that considers the interplay among economic, environmental, and social factors. At the same time to accelerate the transition from fossil fuels, public policies must be put in place that promote green technologies, investment in infrastructure upgrades and subsidies for sustainable energy. It is important to emphasize that effective legislation plays a key role in attracting investment in the energy sector. It creates a stable and predictable legal environment, which is very important for investors considering long-term projects.

13. Reaching net zero by 2050 requires further deployment of available technologies, as well as use of new technology solutions that are not on the market yet. According to the IEA Report Net Zero by 2050: a Roadmap for the Global Energy Sector, most of the global reductions in CO2 emissions through 2030 come from technologies already available today. Advanced batteries, carbon capture, utilisation and storage; hydrogen and hydrogen-related fuels and bioenergy can critically contribute to cuts in CO2 emissions between 2030 and 2050. However, in 2050, almost half of the reductions will come from technologies that are currently at the demonstration or prototype stage and are not available at a large scale today. According to estimates, innovation process to bring new technologies to market usually takes 20 to 70 years. These solutions require significant investment in research and development, as well as supportive public policies for effective integration into the economy.

14. The world is at the “dawn of a new industrial age” of clean energy technology manufacturing that is forecasted to triple in value by 2030 and create many new jobs. The IEA in its Report Energy Technology Perspectives 2024 estimates that the global market for solar PV, wind turbines, electric cars, batteries, electrolysers and heat pumps is set to rise from 700 billion USD in 2023 to more than 2 trillion USD by 2035. Also, assessments are that the annual market for key mass manufactured clean energy technologies could reach 650 billion USD by 2030, and jobs in the sector could rise to 14 million with most of the employment tied to clean energy. While the green transition may cause temporary challenges in the labour market, it also offers a wide range of opportunities for new growth and new job creation, contributing to a more resilient and competitive economy. The World Economic Forum projected that clear transition could create 10 trillion USD of global GDP growth and 395 million jobs by 2030.

15. The transportation sector is one of the largest contributors to greenhouse gas emissions globally, primarily from fossil fuel combustion and its impact on the climate and human health cannot be overstated. According to the estimates of the International Transport Forum, total transport activity is expected to more than double by 2050 compared to 2015. Moreover, the anticipated greenhouse emissions from transport could increase by 60 percent by 2050 as the demand for mobility grows in the coming decades. Measures aimed at decarbonising the transport sector are becoming key elements of government policy in many countries. They include stimulating sales of electric and hybrid vehicles, production of biofuels, synthetic fuel, and hydrogen. The rapid growth of electric vehicles is evident. In 2020, one in 25 cars sold was

electric; in 2023, this is one in 5. The number of electric cars sold in 2023 increased due to technological innovation, lower prices and greater competition. Investing in the greening of transport is not only an environmental imperative but also a significant opportunity for enhancing public health, driving economic growth, and promoting sustainable development. Collaborative efforts among governments, private sectors, and communities are essential for realizing a greener future where transportation is efficient, affordable, and environmentally friendly.

16. Ensuring sustainable agriculture is a crucial component of achieving a greener future and addressing the challenges posed by climate change. The agricultural sector is a significant contributor to global greenhouse gas emissions, accounting for approximately one-third of total emissions. Current trends in climate change, including rising temperatures, changing precipitation patterns, and increased frequency of extreme weather events (such as droughts, hurricanes and floods), pose serious threats to agricultural productivity and food security. This situation is getting more alarming given the population increase and the challenge of feeding more than 9.7 billion people by 2050. Introduction of innovative technologies like bioengineering, use of big data, artificial intelligence, blockchain, cloud computing, and Internet of things have the potential to contribute to increased crop yields and more efficient use of resources. Investing in sustainable agricultural practices and technologies is key to build a food system that is efficient, environmentally friendly and socially responsible, and that ensures food security and environmental protection for future generations.

17. Circular economy is a vital pillar of the green transition and promotes sustainability across various sectors. The circular economy aims to reduce waste generation by maximising the use of resources, including recycling, reusing, and refurbishing materials, thereby reducing waste and pollution. The circular economy encourages the efficient use of resources at all stages of the production process, optimisation of supplies, the selection of more sustainable materials and the adoption of innovative technologies that reduce energy and water consumption. Introduction of new technologies, notably the Internet of things and big data tools, 3D printing and artificial intelligence are bringing advances in production and manufacturing capabilities. According to the United Nations Environment Programme, use of natural resources has tripled over the last fifty years. Global resource consumption is predicted to rise 60 percent by 2060, compared with 2020 levels if the same trend continues.

18. Green transition is a long-term and challenging process that significantly influences various socio-economic aspects. The shift toward a greener economy often requires restructuring traditional industries and investing in new technologies. The transition to a sustainable economy and green technologies promises creation of new jobs in emerging sectors but may also lead to job losses in traditional fossil fuel industries. It is therefore necessary to ensure that this transition is managed effectively to ensure economic stability. The success of this transition will depend on the ability of societies to adapt to change, embrace new technologies, and prioritize sustainability in all aspects of economic and social life. According to the International Monetary Fund, aligning infrastructure with net zero emissions requires additional public investments in the range of 0.5 to 4.5 percent of GDP cumulatively over the next decade, with most estimates clustered around 2 percent of GDP. McKinsey Global Institute in its Report the Net-Zero Transition: What it Would Cost, What it Could Bring, suggests that the transformation of the global economy needed to achieve net-zero emissions by 2050 requires 9.2 trillion USD investment per year. Such investments are needed to modernize existing systems and create new, more sustainable and efficient solutions. Transforming the global economy to achieve net-zero emissions requires complex efforts and significant investments, but it also represents a unique opportunity for sustainable development and improved quality of life throughout the world.

19. The deployment of clean technologies is closely linked to the increased demand for critical resources and materials. As the world shifts toward renewable energy systems, electric vehicles, and energy storage solutions, the need for specific minerals and materials, like copper, cobalt, nickel, lithium, rare earth elements, has surged. As an example, producing a typical electric vehicle requires six times the mineral inputs than that of a conventional internal combustion engine vehicle. Forecasts suggest that global demand for raw materials that are central in the clean energy technology value chains could increase almost fourfold by 2030. At the same time, geopolitical risks associated with the concentration of critical mineral supplies in a few countries may affect the stability and reliability of supply chains. A combination of supply chain diversification, investment in exploration and processing, and active development of new technologies is needed to ensure a sustainable and reliable supply of critical resources. This will help meet growing demand and reduce potential negative impacts on the environment and the global economy.

20. The greener future is not only transforming industries but also reshaping the global labour market. As countries strive to implement clean and digital technologies, the demand for a competent workforce with the necessary skills is becoming increasingly critical. Professionals in fields such as renewable energy engineering, environmental science, and sustainable agriculture are essential for designing and implementing clean technologies. With the rise of smart grids, energy management systems, and digital tools for monitoring emissions and resource use, skills in IT and data analytics are increasingly competitive. To meet the demand of new sectors, it is necessary to develop educational and training programs that will help prepare students and workers ready to meet the new challenges. It is equally important to integrate sustainability principles into existing educational programs in various fields.

21. Investing in research and science, along with establishing new disciplines and specialised institutions is vital for driving innovation and preparing society for the challenges of the green transition and greener future. Research and development drives innovation, which is essential for developing new technologies that can address pressing global challenges. By funding research initiatives, governments and private sectors can foster breakthroughs in renewable energy, energy efficiency, and sustainable practices. Research institutions and universities play a key role in educating future specialists through outreach programs, studies, and collaborative research. Creating new educational institutions, establishing new partnerships between academia, industry, and government, can lead to shared resources, research opportunities, and increased funding for projects that align with sustainability goals. Close cooperation between academia and public administration is key to developing effective policies needed to achieve environmental goals and move towards a more sustainable future.

22. International and regional trade in clean energy technologies is essential for successful green transition. No single country possesses all the resources, technology, nor capacity to cover every segment of the clean energy supply chain. The transition to a greener economy requires stronger collaboration among nations to leverage their advantages. Cooperative frameworks play an important role in financing clean energy projects and can greatly facilitate the process of investing in sustainable technologies. This could include the creation of joint ventures, increased public-private partnerships and co-financing initiatives. Therefore, it is important to cultivate broader cooperation with the aim of strengthening the transition to a greener economy and achieving common sustainable development goals by enabling countries to pool their resources, knowledge and expertise.

23. The Wider Black Sea Region, with its diverse ecosystems and unique natural resources, holds significant potential for facilitating a successful green transition. Countries in the Wider Black Sea Region collaborate on cross-border environmental initiatives, share best practices,

and develop joint projects, that amplifies national efforts to address common challenges. The BSEC Member States give high priority to climate change issue in national and regional agendas. They as many other countries in the world, implement their national policies on low-carbon energy and fulfilment of climate change commitment. It is noteworthy to mention that all BSEC Member States have defined Nationally Determined Contributions (NDCs) to reduce national emissions and implement the Paris Agreement. Achieving clean and affordable energy is a priority for all BSEC Member States.

24. Many BSEC Member States made considerable steps forward in energy transition and achieved results in the production of electricity from renewable sources. Wide range of new technologies is being developed and deployed in various sectors-energy, transport, construction, industry, waste management, agriculture, production, manufacturing, etc. Principles of circular economy are implemented through new ways of doing business that involve saving resources optimizing technological processes. However, despite growing interest and recognition of the importance of green energy to combat climate change, investments in this sector remain insufficient compared to the funding needed to achieve sustainability targets and reduce emissions. A successful transition to sustainable and clean energy requires stronger action to develop a modern energy sector with a focus on carbon neutrality and a green future.

III SITUATION IN THE BSEC MEMBER STATES

25. The development and implementation of national energy and climate policies in ***the Republic of Albania*** aim not only to reduce greenhouse gas emissions, but also to generate significant economic benefits in various sectors. These policies promote investments in renewable energy, energy efficiency and sustainable practices, creating new sources of revenue and stimulating economic growth. The National Energy Strategy 2020-2030, the National Greenhouse Gas Mitigation Plan and the Transport Strategy have set objectives for increasing security of supply, expanding the use of natural gas, increasing the percentage of renewable sources and energy efficiency, and reducing GHG emissions. The "Long-Term Renovation Plan for Public and Private Buildings" is being prepared, reflecting the commitment to sustainable development standards.

26. Energy policies in the Republic of Albania aim to align with broader environmental objectives, promoting a sustainable future. The planned investments in the energy sector are expected to have a significant impact on the growth of the sector and an increase in the workforce in various fields. The expansion of the renewable energy sector has led to the creation of new industries, such as the production of solar panels and wind turbines, increasing employment opportunities. Furthermore, the emphasis on green technologies and infrastructure has fostered innovation, leading to the emergence of new markets and services focused on sustainability. As a result, the transition to a low-carbon economy is not only addressing climate challenges but is also increasing the participation of the workforce in green jobs, contributing to a more diverse economic landscape.

27. Sustainable agricultural practices help reduce emissions, while transport policies encourage the use of electric vehicles and public transport to reduce dependence on fossil fuels. The protection of biodiversity and ecosystems is integrated into climate strategies, ensuring that natural habitats are preserved and restored. The following documents need to be emphasized: the National Climate Change Strategy (2019-2030), the Cross-sectoral Strategy for Agriculture, Rural Development and Fisheries (2021-2027), the Strategy for the Development of the Forest and Pasture Sector (2005-2030) and the Law No. 24/2023 "On the Promotion of the Use of

Energy from Renewable Sources". They call for sustainable practices, efficient use of resources and the deployment of green technologies in various areas.

28. ***The Republic of Azerbaijan*** adheres to the principles of sustainable development, which is reflected in its national policies and international commitments, including the Paris Agreement. Azerbaijan recognizes that addressing environmental issues requires not only domestic efforts, but also regional cooperation. It aims to lead the efforts to create a sustainable future in the Black Sea Region through technology cooperation.

29. By using its resources, experience and strategic partnerships, Azerbaijan aims to address pressing environmental challenges while promoting sustainable economic growth. Key areas of technology cooperation are renewable energy development, water resources management, waste management and circular economy, climate change mitigation and adaptation and smart agriculture.

30. The development of renewable energy sources remains one of the priorities of the state energy policy of Azerbaijan. Thanks to the rich potential of solar and wind energy, the country is actively working to attract foreign investment in this sector. Over the past few years, agreements have been signed with leading international companies for the construction of solar and wind power plants in Azerbaijan. By implementing these projects, Azerbaijan will strengthen its energy security and contribute to the global fight against climate change.

31. A special place among the significant events of the past years is the organisation of the United Nations Climate Change Conference (COP29) in Baku in November 2024, where, along with the main issues of combating climate change, strategic agreements were reached in the field of green energy development. Another important event in green development is the inauguration of the ECO-UNIDO Clean Energy Centre in Baku on 15 November 2024, which engages in joint research in the field of renewable energy, energy efficiency and climate change.

32. The national legislative framework of ***the Republic of Bulgaria*** in the field of climate change policy, transition to renewable energy sources and environmental protection includes the Climate Change Mitigation Act, the Bulgarian Integrated National Plan "Energy and Climate" (INPEC), the Renewable Energy Act, the Plan to determine priority areas of development of wind power generation plants, the Environmental Protection Act, Bulgaria's 2050 long-term strategy, etc.

33. The energy and climate targets for Bulgaria until 2030 are set out in the 2021-2030 Bulgarian Integrated National Plan "Energy and Climate", which was updated in 2024 and is undergoing an environmental and compatibility assessment. The strategic objectives and priorities set out in INPEC cover the five dimensions of the EU Energy Union - (1) decarbonization, (2) energy efficiency, (3) energy security, (4) internal energy market and (5) research, innovation and competitiveness. The INPEC proposes policies to reduce greenhouse gas emissions and measures aimed at low-carbon development in the following sectors: energy, household and public sectors, industry, transport, waste, agriculture, etc. In the transport sector, INPEC recommends promoting the production and use of electric and other environmentally friendly vehicles, accelerated deployment of charging infrastructure, and encouragement of scientific research and development activities to develop alternative fuel technologies.

34. Bulgaria introduces various technologies with zero greenhouse gas emissions and high degree of energy efficiency in industry, transport, buildings, agriculture and other sectors. To this end, the National Recovery and Resilience Plan is being implemented, which includes a number of reforms and investments specifically aimed at deploying clean technologies, such as: creation of a national decarbonization fund; promoting energy efficiency and renewable energy projects through energy bills; stimulating production of renewable electricity;

unleashing the potential of hydrogen technologies and hydrogen production and supply; construction of new hydropower plants for self-consumption in combination with local energy storage facilities on-site; support for the transition to a circular economy; support for energy renovation of buildings; support for renewable energy for households; support for energy-efficient street lighting; support for new renewable electricity generation and storage capacity; national infrastructure for storage of renewable electricity; investments in technological and environmental upgrading for Bulgarian farmers; projects for environmentally friendly mobility in accordance with the Sustainable Urban Mobility Plans. Moreover, clean technology is one of the five emphasized areas of the 2021-2027 Smart Specialization Innovation Strategy.

35. In ***the Hellenic Republic***, the General Secretariat for Research and Innovation (GSRI) of the Ministry of Development is responsible for planning and coordinating the implementation of the national policy for research, technological development and innovation. It supports activities of the research community and industry through competitive programs and actions, emphasizing both economic growth and social justice. The GSRI represents the Hellenic Republic in the European Union institutions and international research organizations. The Hellenic Republic participates in Horizon Europe Clean Energy Transition Partnership (CETP) and Horizon Europe Sustainable Blue Economy Partnership (SBEP).

36. Energy transition is a key priority of the energy policy of the country. The National Energy and Climate Action Plan sets out national priorities and policies regarding the long-term objective of achieving climate neutrality by 2050 through energy efficiency and the development of renewable energy sources. The National Recovery Plan outlines the strategy that will enable the sustainable development of the Greek economy. It includes integrated reforms for the transition to a new low-carbon energy model. The National Climate Law 4936/2022 (A 105) aims to create a coherent institutional framework to improve the country's adaptation capacity and climate resilience, as well as the gradual transition to climate neutrality in environmentally sustainable, socially equitable and cost-effective manner.

37. On the path towards a green transition, the Hellenic Republic's strategic choice is to be the energy hub of Southeastern Europe, given its geographical location, steps taken towards energy security, infrastructure resilience and diversification of energy sources. The country participates in important schemes of international and regional cooperation, such as the Energy Community, the Central and South-Eastern Europe Energy Connectivity, the Energy Charter, the Transatlantic Partnership for Cooperation in the Energy and Climate, the BSEC, etc.

38. The transition to a green economy of ***the Republic of Moldova*** is strongly influenced by its alignment with EU directives and international climate commitments. The National Energy and Climate Plan for 2025-2030 serves as the central policy document guiding renewable energy development and emissions reduction strategies. The country's legislative framework includes Law No. 10/2016 on Renewable Energy and the Law No. 139/2018 on Energy Efficiency. The Environmental Strategy for 2024-2030 sets sectoral GHG reduction targets by 2030. The Regulation on sustainability criteria and greenhouse gas emission reduction for biofuels, bioliquids, and biomass fuels was adopted in 2025 along with the Methodology for calculating their impact on greenhouse gas emissions.

39. The Republic of Moldova has implemented a range of state policies and national programs aimed at facilitating the transition to a low-carbon economy. The Green Economy Promotion Program (2020-2025) has been instrumental in increasing energy efficiency in buildings, promoting the greening of small and medium-sized enterprises and fostering green financial instruments for renewable energy investment. In the transportation sector, the Sustainable Transport Strategy (2024-2030) aims to cut CO2 emissions by 15 percent, promote low-carbon

public transportation and invest in green mobility infrastructure. The renewable energy sector is projected to play a crucial role in economic growth and expanding the country's solar and wind capacity is expected to create over 5000 new jobs by 2030.

40. The Republic of Moldova is committed to the development of clean technologies and the introduction of competitive net-zero solutions. A key priority is the modernization of the energy infrastructure, with a focus on battery energy storage systems. The Government is also investing in solar PV, wind power, geothermal energy and green hydrogen.

41. ***Romania*** is committed to reduce greenhouse gas emissions in order to combat climate change effects and achieve the objectives of the Paris Agreement, also in the context of the European Green Deal. The Government aims to transform society and the economy, contributing to the goal of sustainable development. It will also ensure a fair and sustainable transition by equitably sharing costs, fostering innovation, and implementing structural changes to secure long-term jobs and economic stability.

42. The Romanian Government approved the Long-Term Strategy for Reducing Greenhouse Gas Emissions – Romania Neutral in 2050, aiming for climate neutrality by reducing emissions by 99 percent from 1990 levels. Furthermore, a new National Strategy on Climate Change Adaptation (SNASC 2024–2030, with a 2050 outlook) was approved. The Strategy covers multiple key sectors, including water resources, forests, public health, education, energy, and transport, offering specific measures for each field.

43. Regarding state policies and national programs on the transition to a green economy, the following projects were prioritized in 2024: the program on improving air quality and reducing greenhouse gas emissions by using cleaner cars and developing charging stations for electric vehicles; the program for setting up solar panel systems; the program for street public lighting (LED lamps); the program for increasing energy efficiency; the program for developing cycling infrastructure in Romania; the program for providing support for the acquisition of heating appliances for households in mountain areas; the program for replacing used electrical and electronic equipment with more energy-efficient ones, etc.

44. The Ministry of Environmental Protection of ***the Republic of Serbia*** has made progress in many areas of the Green Agenda for the Western Balkans, which has contributed to a significant degree of alignment of the legislative framework of the Republic of Serbia with EU requirements. In the previous period, the following strategic documents were adopted: Low-Carbon Development Strategy of the Republic of Serbia for the 2023-2030 period with projections until 2050; Nationally Determined Contribution of the Republic of Serbia until 2030; Waste Management Programme for the 2022-2031 period, with Action Plan for the 2022-2024 period; Water Management Plan on the territory of the Republic of Serbia until 2027; Climate Change Adaptation Programme for the 2023-2030 period; Law on Environmental Impact Assessment, etc. The Law on Climate Change was adopted in 2021.

45. Several documents are being drafted, such as the Waste Prevention Plan, the Circular Economy Development Programme, the Nature Protection Programme, the Industrial Safety Programme, etc. The adopted Integrated National Energy and Climate Plan for the period until 2030 with projections by 2050 envisages a number of measures in the field of decarbonisation related to GHG emissions from the energy and other sectors of the economy.

46. By adopting documents in the field of climate change, the basis has been set for implementing measures to mitigate the negative impacts of climate change by decarbonising key economic sectors. The Environmental Protection Strategy with an Action Plan for the 2024-2033 period is currently being developed. It represents a comprehensive umbrella

document in the field of environmental protection, with which all other strategic and planning documents should be harmonised.

47. ***The Republic of Türkiye*** is developing comprehensive environmental, economic and social policies to address the green transition process in line with sustainable development goals. Particular attention is paid to investments in renewable energy sources, the transition to circular economy model, energy efficiency projects and efforts to comply with international regulations.

48. Türkiye's environmental policies, together with the EU harmonization process are focused on increasing the use of renewable energy resources, ensuring resource efficiency and accelerating the transition to clean energy. The Green Transition Support Program, launched by the Ministry of Industry and Technology, supports investments that are compatible with the circular economy approach, protect natural resources, contribute to climate and sustainability goals, and aim for resource-efficient and low-carbon production.

49. The concept of green transition is strongly emphasized in the Twelfth Development Plan. One of the main axes of the plan, "Competitive Production with Green and Digital Transformation" determined overall strategies and targets. They include increasing resource efficiency in production, adopting low-carbon technologies and accelerating digitalization. Concrete targets have been set for adaptation to climate change and emission reduction by ensuring intersectoral coordination within the framework of Climate Change Mitigation and Adaptation Strategies and Action Plans. Priorities such as technology investments in line with Türkiye's 2053 net zero emission targets, development of digital and green skills, financing and incentive mechanisms are included.

50. The Turkish National Energy Plan (2022) covers the period until 2035 and reveals the most appropriate energy sources, resource usage amounts, production and consumption projections. Türkiye implements various incentives to increase the use of renewable energy resources and encourage solar, wind and hydroelectric energy projects, as well energy efficiency. Important steps have been taken towards the electrification of the transport sector. The number of electric vehicles was 6000 in 2020, and it reached 168000 in 2024. In addition, a solid legal framework to support sustainable waste management practices was established. The Environmental Law and the Zero Waste Regulation were adopted. The Energy Performance Regulation in Buildings, entered into force in 2008 and Green Certificate Regulation for Buildings and Settlements entered into force in 2022. In addition, research and development studies in the fields of clean energy and sustainability are supported through institutions such as the Scientific and Technological Research Council of Türkiye (TÜBİTAK).

IV INTERNATIONAL AND REGIONAL FRAMEWORK AND EXPERIENCE

51. International and regional frameworks play a significant role in shaping strategies aimed at addressing environmental issues and supporting sustainable development. International best practices serve as a basis for developing and implementing sustainable and effective programmes aimed at protecting the environment and improving the quality of life of the population.

The global level

The United Nations Framework Convention on Climate Change (UNFCCC)

52. Signed in 1992, the United Nations Framework Convention on Climate Change (UNFCCC) set an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. Within the UN Climate Change process, countries have confirmed the importance of enhancing technology development and transfer to developing countries. To facilitate this, in

2010 the Conference of the Parties as a decision-making body of the Convention, established the Technology Mechanism. It consists of two bodies: the Technology Executive Committee and the Climate Technology Centre and Network.

53. The latest, 29th Session of the United Nations Climate Change Conference (COP29) was held in Baku from 11-22 November 2024. The COP29 Presidency put forward 14 initiatives covering sustainable development and emission reduction issues, including the creation of green energy corridors and technologies, the development of clean hydrogen and green digital infrastructure. COP29 Declaration on Green Digital Action underlines that digital innovations can reduce GHG emissions across various economic sectors. The Declaration calls for development and adoption of sustainable digital technologies to accelerate GHG emissions reductions, fostering sustainable innovation, sharing of best practices, etc.

54. The recent USA withdrawal from the Paris Agreement raises substantial challenges for global climate efforts, particularly concerning the collective commitment necessary for meaningful progress. The change in the position of the USA, which is one of the largest emitters of greenhouse gases, may weaken the overall commitment of countries and make international efforts less effective, since the strength of the international climate framework depends on the timely implementation of collective commitments.

The UN Development Programme (UNDP)

55. The United Nations agency on international development works in numerous countries to strengthen their capabilities to achieve the Sustainable Development Goals. Regarding the SDG Goal 7- affordable and clean energy, the UNDP's work is centred around goal targets, to enhance by 2030 international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency, expand infrastructure and upgrade technology for supplying sustainable energy services. The UNDP programmes are successfully realized in the BSEC Member States.

International Energy Agency (IEA)

56. Ensuring reliability, affordability and sustainability of energy are one of the essential objectives for the International Energy Agency (IEA), which was established in 1974. Providing information and policy advice recommendations to countries, the IEA supports their transition to clean energy. Taking an all-technology approach, the IEA examines the full spectrum issues including renewables, clean energy technologies, energy efficiency, etc. The IEA Technology Collaboration Programme supports the work of experts in the fields of research, development and commercialisation of energy technologies with the aim of global transition to a cleaner energy future. Greece and Türkiye are member countries, while Ukraine is an association country to the IEA.

International Renewable Energy Agency (IRENA)

57. Established in 2009, the International Renewable Energy Agency is a universal intergovernmental organisation that supports countries in their energy transitions and provides them with the most relevant analyses on technology and innovation. It encourages the widespread adoption and sustainable use of all forms of renewable energy. All BSEC Member Stats are members of the IRENA.

Regional level

The Organization of the Black Sea Economic Cooperation (BSEC)

58. The BSEC, as a regional economic organization, attaches particular importance to the principle of sustainable development to ensure an optimal balance between economic growth,

social responsibility and environmental protection. Cooperation in the field of green future is streamlined across several Working Groups dealing with energy, environmental protection, science and technology, to name a few.

59. The key priorities for the BSEC activity in the field of energy are defined by the provisions of the BSEC Green Energy Strategy adopted in 2018 and the Goal 4 "Sustainable Energy and Development of the Black Sea Market" of the BSEC updated Economic Agenda "Towards a sustainable future of the wider Black Sea Area", adopted in December 2023. Encouraging cooperation in elaboration of green energy policies, strengthening of regional cooperation in this field, as well as materialization of the vision of transforming the BSEC Region into a model for clean, inclusive and sustainable energy by the year 2050, are of paramount importance for the Region. The Declaration on the Green Energy Development Initiative for the Black Sea Region, adopted by the Ministers of Energy of the BSEC Member States in Nafplion, Greece, on 12 October 2010, highlighted the importance of exploring ways "to promote green energy investments with an emphasis on energy efficiency, renewable energy sources and environmentally friendly energy technologies".

60. Some of the basic energy targets are energy efficiency, use of renewable energy sources, sustainable fossil fuel energy and environmental protection/transition to a clean energy economy. The main activities in the field of energy are carried out by the BSEC Working Group on Energy. The Republic of Azerbaijan is the Country - Coordinator of the Working Group on Energy until 30 June 2025. The current Action Plan is aimed at expanding relations among the BSEC Member States on energy security, trade, investment, and scientific research and promoting the exchange of experience on state-of-the-art technologies.

61. The BSEC Green Energy Network, established in 2015, functions under the auspices of the BSEC PERMIS. Development and promotion of green energy projects are the priority areas of the Network. Regular organization of the BSEC Green Energy Investment Forum stimulates the use of green energy in the BSEC Region. The 11th edition of the Forum was held in Athens on 10 October 2024.

62. Goal 5 "Environment and Climate Action" of the BSEC Economic Agenda stipulates the key priorities regarding the BSEC activities in the field of environmental protection. They include advancing common approaches to green economy, developing environmentally friendly and resource-saving technologies, as well as financial instruments and incentives for environmental protection, etc. BSEC Climate Change Adaptation Strategy for the Black Sea was adopted in 2017.

63. The key priorities for BSEC activity in the field of science and technology are defined by Goal 11 "Strengthening Regional Cooperation in Scientific Research and Technology" of the BSEC Economic Agenda. The Republic of Moldova is the Country-Coordinator of the Working Group on Cooperation in Science and Technology until 30 June 2026. The current WG Action Plan set the following objectives: promotion of regional collaboration to address climate change and environmental degradation, as well as the growing energy needs and the necessity to transition to green clean energy, etc. Also, promotion of science, technology and innovation amongst youth in BSEC countries, development of smart specialization areas among BSEC countries and support to sustainable innovation systems in the region by technology transfer are one of key priorities of the current term of the WG.

European Union (EU)

64. The European Union's top officials restated the EU's commitment the Paris Agreement, as well as its efforts to protect nature and stop global warming. Aiming to achieve climate

neutrality by 2050 the European Union adopted the European Green Deal in 2019. The EU is on the path of clean energy transition, decarbonisation of its economy and the massive deployment of renewable energy sources.

65. The rate of deployment of clean energy technologies is growing progressively in the EU. In 2022, the roll out of wind and solar increased by around 50 percent compared to 2021. REPowerEU Plan launched in May 2022 is accelerating the move away from fossil fuels. The Plan is building on the European Green Deal proposals, and it is expected that boosting energy savings and efficiency, as well as enhancing renewables will lessen the pressure on energy prices, while strengthening the EU green transition.

66. The EU Clean Energy Transition Partnership is a multilateral cooperation of national and regional research, development and innovation programmes in the EU Member States and associated countries. The objective is to accelerate the energy transition through coordinating national and regional research, development and innovation strategies and joint funding for a wide range of technological solutions necessary for the transition.

67. Recognizing its high dependency on imports of critical technologies from third countries, the EU undertook several actions in that direction. Strategic documents, such as the 2023 Green Deal Industrial Plan, the Net-Zero Industry Act and the Critical Raw Materials Act seek to lower the dependence on the imports of net-zero technologies, strengthen value chain resilience, and build a strong domestic manufacturing base.

68. On 1 March 2024, the Regulation establishing the Strategic Technologies for Europe Platform (STEP) entered into force. Its aim is to support the development and manufacturing of critical technologies in three sectors - digital technology innovation, clean and resource efficient technologies, and biotechnologies, as well as to address shortages of labour and skills. In recent months, the EU has witnessed major developments on the market in terms of new projects and investment announcements for key net-zero technology manufacturing in the EU. These include solar PV, wind, batteries, heat pumps, electrolysers and fuel cells.

The Green Agenda for the Western Balkans (GAWB)

69. Launched by the European Commission in October 2020, the Green Agenda for the Western Balkans is an initiative aligned with the European Green Deal aiming to promote the green transformation of the Western Balkans. By endorsing the GAWB in 2020, the region committed to aligning with the EU's objective of achieving carbon neutrality by 2050. The Agenda is focused on the following areas-decarbonisation, circular economy, depollution, sustainable food systems and rural areas and biodiversity. It is managed by the Regional Cooperation Council (RCC).

V. CONCLUDING REMARKS

70. Building a greener future reflects a collective acknowledgment of the urgent need to address environmental degradation and climate change. The green progress is being achieved as the countries minimize the impact of economic activity on the environment and raise public awareness. The achievements in the field of green initiatives are significant, but continuous improvement of the adopted solutions is necessary for stable and long-term progress. Possible changes in the political landscape can affect the financing and implementation of environmental programs, so it is very important to maintain a commitment to sustainable development at all levels. Enhancing the determination of countries to pursue a sustainable, greener future involves a multifaceted approach contributing to the creation of an ecologically sustainable future.

71. A clean green technological shift is crucial for achieving a sustainable and greener future. Transitioning to the technologies such as renewable energy sources (solar, wind, hydropower, and geothermal) is essential for mitigating climate change and its adverse impacts on the environment and society. Green technologies promote efficient use of resources by minimizing waste and enhancing recycling processes. Innovations in materials science and manufacturing practices contribute to a circular economy which enables recycling and more efficient use of natural resources.

72. Science and research are at the forefront of constructing a greener future. By driving innovation, green policies, and educating the public, scientific endeavours provide the foundation for sustainable development. A collaborative approach involving scientists, policymakers, businesspeople, and communities is essential for effectively addressing environmental challenges and promoting a sustainable and resilient greener future. Educational programs at all levels can equip individuals with knowledge about the impacts of climate change and environmental conditions. Better understanding the benefits of sustainable and green practices can strongly motivate communities and individuals to change their lives.

73. Green technology solutions are fundamental to achieving a sustainable, resilient, and healthier future. Green technologies play a critical role in combating climate change by reducing greenhouse gas emissions. Renewable energy sources such as solar, wind, and hydroelectric power significantly decrease reliance on fossil fuels, helping to lower carbon footprints and mitigate global warming. Green technology solutions promote recycling and help conserve natural resources and create more sustainable and balanced systems that help protect the environment and ensure prosperous future for generations to come.

74. The BSEC Member States are implementing advanced technological solutions towards developing a more sustainable future, addressing the pressing environmental challenges in several sectors driving economic growth and innovation. Their actions are to be embedded in broad national plans and programmes for economic and social development in line with global environmental challenges and adjusted to the specific national ecological, economic and social circumstances. All countries closely follow the latest evolutions in the world and invest in the expansion of green and digital technologies, laying the foundations for sustainable green growth and future social progress.

75. Steering the green development paradigms and achieving a greener future in the Black Sea region and beyond necessitates a multifaceted approach. Green policies become even more effective when intertwined within broader global strategies. This integrated approach brings together different aspects of sustainable development and channels the efforts towards achieving a synergistic effect. The synergy between green policies and environmental sustainability enables to integrate environmental viewpoints into key areas of economic policy, which in turn contributes to the creation of healthy, safe and prosperous societies and an improved quality of life for people.