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Accelerating the delivery of energy for sustainable development:
International Fora on Energy for Sustainable Development and Energy Ministerial

Eighth International Forum on Energy for Sustainable Development: Building on regional cooperation

Note by the secretariat

I. Introduction

1. The International Forum on Energy for Sustainable Development, an annual event since 2010, has made major contributions to the global dialogue on sustainable energy and is an excellent model for the impact a multi-stakeholder approach can have. Since 2014, the annual fora have been organised by all five Regional Commissions working collaboratively.

2. The global sustainable development agenda requires countries to pursue concerted and accelerated action on energy in their national programmes in order to meet the challenge of sustainable energy. The international fora process provides countries with the opportunity to reflect on the challenges towards implementing the Sustainable Development Goals and other aspirational pledges such as the Paris Agreement on climate change. The dialogues offered through the fora are intended to enhance the understanding of sustainable energy and possible policy drivers to achieve a common goal on sustainable energy, promote a policy dialogue and provide awareness-raising of different outcomes that could emerge over time – building on the strength of regional and cross-sectoral cooperation. Thus, the events provide an opportunity to explore how the United Nations system can help implement or pursue sustainable agendas putting to the fore the regional context.

3. The Fifth International Forum on Energy for Sustainable Development[1] in 2014 called for a deep long-term transition to a sustainable energy future. The Sixth International

[1] The Executive Secretaries of the UN Regional Commissions signed a joint statement (the Hammamet Declaration) in 2014, a call for action in which three key components were highlighted: a) Energy efficiency in most countries needs to improve more quickly; b) Renewable energy policies need to be redesigned; and c) Equitable access to modern energy services requires mobilizing adequate

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Forum on Energy for Sustainable Development[2] set out five concrete steps the United Nations Regional Commissions could take collectively to strengthen the sustainable energy agenda. The Seventh International Forum on Energy for Sustainable Development[3] defined the challenges ahead and developed a roadmap for the international community to achieve common goals.

4. This document reports on progress made and presents concrete action outcomes from the Eighth International Forum on Energy for Sustainable Development and Energy Ministerial (the Eighth Forum) (see Annexes I to III). It provides the background for the discussion of the Committee on Sustainable Energy (the Committee) about the recommendations resulting from the Eighth Forum and their implementation.

II. The Eighth International Forum and Energy Ministerial

5. The Eighth Forum was held in Astana, Kazakhstan, on 11-14 June 2017. It began with a ministerial event with the title "Meeting the challenge of sustainable energy" on 11 June 2017, in the framework of the EXPO 2017 "Future Energy".[4] It was jointly organized by the Government of Kazakhstan and the five Regional Commissions. Other organizations, including the International Energy Agency (IEA), the International Energy Charter, the International Renewable Energy Agency, the Organization of the Petroleum Exporting Countries, the World Energy Council, and the United Nations Secretary General's Sustainable Energy for All (SEforAll) initiative were partners.

6. The Eighth Forum built on the previous outcomes and experiences and following the recommendations by the Committee at its twenty-fourth and twenty-fifth sessions designed a more holistic approach with a view to engage the political level. The Eighth Forum in consequence began with an energy ministerial conference, as a major stepping stone in the history of this international fora process and as a sign of increasing importance and recognition by participants.

7. The events in Astana were about understanding the challenge towards attaining sustainable energy for all, seeking to advance solutions that promote energy efficiency and existing low-carbon energy technologies and policies in a cross-sectoral and collaborative manner, i.e. for the first time the agenda included not only energy efficiency and renewable energy tracks, but also the role of fossil fuels and regional collaboration. The Committee welcomed and endorsed this novel approach to the fora process (ECE/ENERGY/99, para. 89, and ECE/ENERGY/107, para. 39 to 59).

8. Over 1000 international energy experts, government officials, and representatives from the business community, financial sector, academia and civil society attended over four days.

A. The Energy Ministerial

9. Participating ministers and high-level participants adopted the Astana Ministerial Statement on Sustainable Energy on 11 June 2017 after the first day of the Eighth Forum (see Annex III of this document). The Ministerial Statement contains seven voluntary actions, from establishing national sustainable energy action plans, developing internationally recognized minimum energy performance standards in all sectors, and

resources. See: http://www.unece.org/fileadmin/DAM/energy/se/pdfs/ee21/Forum_November_Tunisia/Joint_Statement_Fifth_International_Forum_Final_All.pdf

[2] See: http://www.unece.org/fileadmin/DAM/energy/se/pdfs/eneff/6th_Forum_Yerevan_Sept.2015/IFESD.6_Action.Plan_Joint.Statement.pdf

[3] https://www.unece.org/index.php?id=45627#/.

[4] http://energyministerial.kz/ and https://www.unece.org/astana2017.html#/

advancing methods for public data collection and indicators on energy for sustainable development.[5] The Ministerial Statement had emerged from recommendations by the Committee at its twenty-fifth session and prior consultation process (ECE/ENERGY/2016/9/Rev.1).

10. The Ministerial Statement is a non-binding document based on the ministerial dialogues. The recommendations and solutions it contains will be further integrated into a "Manifesto of Values of Expo 2017", which is planned to consolidate proposals of private sector, governments, academia and environmental organizations, business-structures to create a new model of energy after the closure of EXPO 2017 in September 2017.

III. Implementing the outcomes of the Eighth Forum

11. When adopting the Ministerial Statement, ministers requested that the Eighth Forum participants explore means for achieving the intent of the Statement. They also requested that progress toward attaining the objectives of energy for sustainable development be assessed in future high-level meetings organized under the auspices of the United Nations. It is hoped that ministers and high-level participants will agree to become ambassadors for the key messages and recommendations at later gatherings that they will participate in.

12. Annex I of this document presents the outcomes that have subsequently emerged from the Eighth Forum, seeking to take the ministerial recommendations further. Participants endorsed this document at the closing session of the Eighth Forum and encouraged involved intergovernmental organizations and partners to submit this document and together with the Ministerial Statement to their respective governing bodies for endorsement and subsequent action. Annex II presents key messages and outcomes from the different tracks of the Eighth Forum with a focus on low-carbon energy technologies and policies. A more detailed report of the entire Eighth Forum is under preparation and will be made available on the Eighth Forum website.[6]

13. This document (ECE/ENERGY/2017/2) is presented to the Committee as a basis for an informed discussion about the implementation of the recommendations resulting from the Eighth Forum.

14. The Committee will be consulted on the preparations for the Ninth International Forum on Energy for Sustainable Development, to be hosted by Ukraine in Kiev in the fall 2018, and again to be co-organised by the five United Nations Regional Commissions.

15. The event will seek to drive the outcomes and experiences from the international fora process further, this time possibly with a view on energy security and infrastructure and supply security in the context of sustainable energy for all. The Ninth Forum will be another opportunity for the United Nations system to raise the importance of the regional context and collaboration in attaining sustainable energy goals.

[5] For more information see https://www.unece.org/info/media/presscurrent-press-h/sustainable-energy/2017/ministers-adopt-declaration-to-accelerate-global-transition-to-sustainable-energy/doc.html
http://energyministerial.kz/906/uploads/2016/10/declaration_eng_070617.pdf

[6] https://www.unece.org/astana2017.html#/

Annex I

Implementing the Astana Ministerial Declaration: Outcomes of the Eighth International Forum on Energy for Sustainable Development

1. On 11 June 2017, ministers and prominent experts participating in the Ministerial Conference and Eighth International Forum on Energy for Sustainable Development (the Eighth Forum) endorsed the Astana Ministerial Statement (Annex III).[7] Ministers requested that the Eighth Forum participants explore means for achieving the intent of the Statement. They also requested that progress toward attaining the objectives of energy for sustainable development be assessed in future energy ministerial meetings organized under the auspices of the United Nations.

2. This document presents the relevant outcomes that emerged from the Eighth Forum. Participants endorsed this document at the closing session of the Forum and encouraged involved intergovernmental organizations and partners to submit this document and the Astana Ministerial Statement to their respective governing bodies for endorsement and subsequent action.

3. The Eighth Forum addressed:

(a) Accelerating the transition to a sustainable energy system;

(b) Accelerating the uptake of renewables;

(c) Improving energy efficiency in buildings;

(d) Improving energy efficiency in industry;

(e) Understanding the role of natural gas in the 2030 Agenda for Sustainable Development;

(f) Valuing coal mine methane;

(g) Extending deployment of United Nations Framework Classification for Resources;

(h) Reducing the environmental footprint of fossil energy through deployment of high efficiency, low emissions technology and carbon capture use and storage;

(i) Building on international cooperation and collaboration; and

(j) Improving data quality and indicators.

4. The following initiatives are recommended by the Eighth Forum for consideration by countries:

A. Accelerate the transition to a sustainable energy system

5. Invest in education at all levels to build capacity for handling complexity as the world moves to a holistic and integrated systems perspective in energy policy.

B. Accelerating the uptake of renewables

6. Continue to track the progress of renewable energy deployment in countries of South and Eastern Europe, the Caucasus and Central Asia and address the relevant barriers;

[7] http://energyministerial.kz/about/outcome-document/

7. Promote and participate in cross-sectoral dialogues (e.g. energy efficiency, renewable energy, gas, finance etc.) to enable effective interaction among supply- and demand-side alternatives in energy markets;

8. Develop the necessary frameworks that promote investments in renewable energy development and deployment, including through enhanced dialogue among public and private renewable energy stakeholders (e.g. demand-driven “hard talks” in ECE member countries);

9. Promote institutional learning about the interplay between renewable energy and gas, including about efficient distribution networks, flexibility of fossil fuel plants and variable renewables;

10. Provide training for fossil-intensive economies about the development of holistic energy strategies and pathways to achieve sustainable energy. This could include the economic integration of renewable energy technologies into the future national energy system and developing an integrated approach for the water-energy-food-ecosystems nexus as part of greening the economy;

11. Increase the involvement of the private sector in developing and financing renewable energy projects;

12. Develop the skills of the public and private sectors at the national level to identify, develop, promote and implement renewable energy investment projects through matchmaking support activities.

C. Improving energy efficiency in buildings

13. Endorse the framework guidelines for energy efficiency standards in buildings and pursue their widespread deployment;

14. Use key performance indicators to evaluate smart and sustainable cities.

D. Improving energy efficiency in industry

15. Organize seminars to help policy makers understand the perspective of industry, help industry appreciate the financial and productivity benefits of energy efficiency, and apply both sets of lessons to finance and supporting organizations;

16. Find a host country and a flagship project as a case study on legacy industrial complexes that use inefficient technologies and processes. The intent is to deploy readily available and modern technologies and expertise when industrial complexes are modernising as part of a country’s greening the economy strategy;

17. Create framework conditions that allow industry and capital markets to invest. Develop a robust and flexible business model for efficient transition of an outdated site that could be replicable in other industrial complexes.

E. Understanding the role of natural gas in the 2030 Agenda

18. Develop and deploy best practices for monitoring and abating methane emissions;

19. All oil-producing nations to endorse the World Bank-introduced “Zero Routine Flaring by 2030” Initiative. The Initiative is designed to end the wasteful oil industry practice of routinely flaring associated gas at oil production sites around the world. Global gas flaring causes substantial emissions of CO_2, methane, and black carbon, in addition to wasting vast quantities of a natural resource that could be conserved or put to productive use.

20. Establish a partnership among the gas industry, governments, and other players to sustain the transition to the future energy system.

F. Valuing coal mine methane

21. Support development of coal mine methane projects that assist coal companies in adapting to changing economic and environmental conditions and provide them with additional source of revenue thus facilitating their sustainability;

22. Support the establishment of international centres of excellence on coal mine methane worldwide to train professionals and disseminate principles-based best practices to support coal mine methane projects.

G. Extending deployment of United Nations Framework Classification for Resources (UNFC)

23. Encourage countries and private industry to adopt UNFC as a tool to aid communication and sustainable management of resources;

24. Develop guidelines and case studies for application of UNFC to coal mine methane projects and waste to energy and materials from wastes projects.

H. Reducing the environmental footprint of fossil energy through deployment of high efficiency, low emissions (HELE) technologies and carbon capture use and storage (CCUS)

25. Encourage governments, the private sector and international organizations to provide funding, technology transfer and other support mechanisms for worldwide deployment of HELE technologies;

26. Provide policy parity to advanced coal technologies and CCUS with other low carbon technologies. Governments are encouraged to put in place measures to ensure this policy parity.

I. Building on international cooperation and collaboration (awareness raising among stakeholders)

27. SPECA[8]: Enhance strategic partnerships for conjunctive operation of thermal power plants and hydropower plants in Central Asian through transboundary cooperation to achieve sustainable power supply;

28. Support UNECE and ESCAP initiatives for developing cooperation and synergies to promote technical assistance projects in Central Asia.

J. Improving data quality and indicators

29. Support future regional reports on the tracking of progress of the attainment of the Sustainable Development Goals, in particular on energy, e.g. the 2017 Global Tracking Framework regional companion reports;

30. Participate in the UNECE project “Pathways to Sustainable Energy” – the project would be strengthened by wider participation of donors and countries.

[8] The United Nations Special Programme for the Economies of Central Asia (SPECA) was launched in 1998 to strengthen subregional cooperation in Central Asia and its integration into the world economy.
The countries of SPECA are Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

Annex II

Key messages resulting from the Eighth Forum on Energy for Sustainable Development

I. Hard talks-12 June 2017

A. Energy transition and energy security

- The attainment of global sustainable energy targets (Sustainable Development Goal 7 and other energy-related elements of the 2030 Agenda) is not on track.
- Increasing the share of novel energy sources contributes to increasing complexity in grid management, while most utilities still operate along traditional lines. A change from traditional central network management to automated systems that can manage both distributed generation and flexible supply and demand is required, as is investing in education at all levels to build capacity for handling the complexity.
- Remote areas lack attention from central government as enhancing energy access is often accompanied by high initial investment costs, fragmented policies, heavy subsidy dependence, low maintenance of infrastructure, and a dearth of innovative business models.
- Achieving energy security requires a comprehensive approach across different sectors, including the environment. Given climate change's impacts on water management, reducing emissions remains a critical objective. In addition, there are a number of new risks emerging from the energy transition.

B. Interplay of renewable energy and fossil fuels

- Natural gas and renewable energy have witnessed significant growth in recent years and are considered key elements in the transition to a cleaner and more secure energy future. However, much of the current discourse considers each in isolation or concentrates on the competitive impacts of one on the other.
- A holistic approach should be adopted to ensure sustainable energy future and reconciliation of tight emissions pathways through exploring synergies and partnerships between renewable energy and natural gas in terms of technology, policies, market structure, and best practices.
- The need for dialogue with involvement of all stakeholders from natural gas and renewable energy industries, financial institutions, government and private sector. The United Nations is the right platform to initiate such dialogue with an objective to ensure sustainable energy future.

II. Track I: Renewable Energy

A. Renewable energy deployment

- Energy supplied by renewable energy is associated with many benefits, including reduced health and climate impacts, economic development, synergies with water and food supply, remote energy access, and the like). Considerations regarding renewable energy should evolve from a narrow view on costs to a broader reflection about its wider benefits for society and its contribution to quality of life.

- Despite comprising over 300 million inhabitants and representing 4.9% of the world's GDP, 17 UNECE countries in South-Eastern Europe, Eastern Europe, the Caucasus and Central Asia accounted for only 0.2%, or USD 0.4 billion, of global renewable energy investments in 2015. Attracting investment is a major challenge for these countries, despite existing support schemes and policies for renewable energy.
- Increasing the share of renewable energy in the energy mix requires involvement of both the private and public sectors in developing and financing projects, development of policy, normative, regulatory and institutional frameworks to create a suitable environment, promote economic investments, and development of capacities and skills at national level to identify, develop and implement projects. This is even more important in the aforementioned regions.

B. Financing Renewable Energy

- Increasing the share of renewable energy in the energy mix requires the following conditions: Involving the private sector in developing and financing renewable energy projects; developing policy, regulatory and institutional frameworks that promote investments in renewable energy; enhancing dialogue among key public and private renewable energy stakeholders; and developing skills of the public and private sectors at the national level to identify, develop, promote and implement renewable energy investment projects.
- Private developers and investors expressed a need for a clear and stable regulatory framework and better contractual investment terms to effectively develop and realize the growing portfolio of renewable energy project proposals. Innovative financial instruments are needed to alleviate currency depreciation risks, in particular as index-linked feed-in-tariffs are gradually reduced. Local banks need to be involved.
- Such innovative investment instruments (e.g. currency hedging) and specific technical assistance can play a crucial role in supporting the project developers, investors and financial institutions.
- Public finance institutions have an important role in facilitating access to finance at local level and mobilizing private finance through provision of risk mitigation instruments. National and subnational actors can mobilize funds through the issuance of green bonds.

C. Renewable energy in the context of crisis and poverty

- Energy is key for development, for the poorest of the poor, and for refugees and migrants. As it is essential to leave no one behind, it is important to bring renewable energy solutions into humanitarian operations by including them in the planning stages and for the opening of new operations in the future.
- Renewable energy solutions can be economically viable even in harsh conditions and crises. We need sustainable solutions that would attract the private sector to invest in a context that bridges emergency aid with subsequent support and longer-term development. A comprehensive feasibility study is necessary, which should include, in addition to the technical aspects, the social, developmental and environmental aspects of bringing renewable energy solutions to refugee camps and host communities.
- Deploying renewable energy systems must be accompanied by training and capacity building to harness the full potential and ensure sustainability.

III. Track II: Energy efficiency

A. Energy efficiency implementation

- Improving energy efficiency in buildings can make a substantial near-term contribution to both climate change and quality of life. Wide deployment of the Framework Guidelines for Energy Efficiency Standards in Buildings is an important step. Immediate actions include dissemination of the guidelines, education and training, and research and consultation, while engaging all relevant networks and stakeholders.
- A mix of incentives, obligations and awareness raising among stakeholders on both self-financing potential of energy efficiency and its multiple benefits is proposed as the best policy approach.

B. Improving energy efficiency in industry

- Industry is responsible for one third of the global primary energy consumption and CO_2 emissions. The sector will contribute much of the 88% global economic growth expected by 2050. In order to reduce CO_2 emissions it will be important to change the energy mix, but reducing energy consumption will be key. Existing economic technology solutions can reduce energy consumption in industry by 30%. However, even specifically designed policies have not yet managed to overcome barriers.
- Improving energy efficiency has been demonstrated to be cost effective and in line with typical industry investment criteria, but it is still over-reliant on climate change as a driver rather than on a solid business case. There is a need to convince industry of the beneficial role energy efficiency improvements can play within their overall business model.

C. Smart Sustainable Cities

- A growing number of cities are leading by example and setting the pace and scale of action to put the climate on a safe pathway also with the support of Information and Communication Technologies (ICTs), inspiring many other cities to follow suit.
- The concept of Smart Sustainable Cities is a combination of solution-oriented and integrated approaches based on technological innovations, enabling conditions from governments, stakeholders' collaboration and citizens' participation to address the current and future challenges of cities and make them better places to live in. To support the transition to smart, sustainable cities, the use of key performance indicators and the foregoing framework guidelines are critical to analyze the cities' performances, set priorities for change, update and improve existing standards, and increase access to sustainable energy and achieve a better quality of life.

D. Renewable energy and energy efficiency holistic policies

- Renewable energy and energy efficiency policies need to work together to achieve carbon reductions and greater energy security. Effective energy pricing, joint governance, good data and public sector exemplars are important tools for achieving this.

IV. Track III: Modernizing energy industry

A. Role of natural gas

- Natural gas has a role to play in most of the 17 Sustainable Development Goals: fighting poverty, hunger, and climate change, improving water sanitation and heat, and enabling economic and social development and job creation. In the context of job creation, the experiences and skills gained in the today's gas industry could be put to good use in creating the future energy system. This requires a partnership between the gas industry, governments, and other players to sustain the transition to the future energy system.
- Gas is the “best partner” for renewables due to its flexibility, and low capital investment and maintenance requirements. It is also a good solution for transport in large cities as it does not produce particulate matter.
- Switching from coal to natural gas in electricity generation can reduce the carbon intensity of fossil energy and significantly improve air quality in many urban areas, in particular in developing countries, given their rapid rate of urbanization.
- Natural gas can contribute to access to energy, through small scale LNG that can bring energy to remote locations such as small islands or isolated communities.

B. Cleaner electricity

- Fossil energy will remain part of the sustainable energy mix because of its role in providing energy access and economic development. High efficiency, low emission technology (HELE) is an important step on the pathway to zero emissions that can be achieved only with carbon capture use and storage. HELE technology will require policy parity with other low emission technologies.
- Deployment of HELE could be accelerated through finance and technology transfer provided by international organizations and other mechanisms.

C. Methane management

- Coal Mine Methane (CMM) is an under-utilized unconventional energy resource. It offers an immediate and powerful opportunity to mitigate emissions, improve social conditions and generate energy economically. Recovery and use of CMM has multiple benefits such as provisioning of clean and affordable energy, improved safety and productivity of coal mining and reduction of a potent GHG. The carbon footprint of coal mining can be reduced through abatement of methane emissions.
- Development of CMM projects offers an additional source of revenue to assist coal companies in adapting to changing economic and environmental conditions.
- An international centre of excellence (ICE) on CMM has been established in Poland and another is being instituted in China to train professionals and disseminate principles-based best practices to aid in the initiation of CMM projects worldwide.

D. Resource management

- The United Nations Framework Classification for Resources (UNFC) is a decision-making and management tool that can help governments and industry to understand the sustainable development benefits of CMM recovery and use, and increase its adoption and practice around the world.

- UNFC is also a tool for addressing wastes. Waste of all kind (solid municipal wastes, mining wastes, industrial wastes, waste water etc.) is a growing concern worldwide and conversion of waste where possible to an energy resource could alter this dynamic significantly. Social issues and licence to operate concerns can stop or significantly hinder the development of energy from waste projects.
- Financing development (feasibility studies, demonstration/pilot plants) and implementation requires major investment of capital and human resources. UNFC is a tool for identifying potential projects, channelling investments and managing their successful execution.
- There was a call for countries around the world to use UNFC widely for resource management.

E. Modernization of industrial ecosystems

- There is an urgent need to mitigate climate change. 80% of today's energy mix based on fossil fuels. Legacy industries (industrial complexes) using inefficient technologies and processes offer an opportunity to deploy readily available and modern technologies and expertise to mitigate environmental impacts.
- UNECE's groups of experts have joined forces to examine opportunities to concentrate their collective capabilities to this end. The effort includes enhancing energy efficiency and deployment of renewable energy in concert with gas, minimizing waste including of natural gas and coal mine methane. Electricity generation in this process is a key step towards energy for sustainable development.
- The initiative seeks a host country and flagship project to inspire further development.

V. Track IV: Regional cooperation

A. Technology center

- The establishment of an international center for technology and investment could to be a major stepping-stone to attract policy, finance and technology knowledge into the Central Asian region. Global practice shows that sustainability and successful operation of such centres depend on proper and consecutive implementation of the preparatory stage.
- Technologies should be affordable for small and medium businesses, and social development should be a cornerstone of the programme. Technologies should aim at increasing employment, including of people with disabilities.

B. Global Tracking Framework (GTF)

- The Global Tracking Framework is an annual report (biannual until 2017) that measures progress to sustainable energy for all. It is coordinated and produced by the World Bank with support from a number of intergovernmental institutions. In 2017, the report was produced with chapters dedicated to a regional approach and therefore drafted by the five United Nations Regional Commissions. The conclusion is that in 2017 the world is not on track to attain the Sustainable Energy Goals. Action needs to be scaled up and accelerated.
- The Regional Commissions have produced companion reports that explore the key trends in greater depth to explain the results obtained in the main GTF report. The reports also explore alternative data sources and consider alternative indicators. One

of the main conclusions of the sessions is that decision-makers will be better informed with a broader range of forward-looking indicators that cut across the 2030 agenda for sustainable development from an energy perspective. Future regional reports in support of the global tracking framework will require further support from donors and participation by countries.

C. Pathways to sustainable energy

- The project is being undertaken in the UNECE region to explore strategic choices whereby countries might attain the objectives of energy for sustainable development. The project recognises that there is not a single pathway to the future energy system as each country has its own starting point and a distinct set of options for how to proceed. The outcome of the project, supported by modelling, will be three-fold: an exploration of strategic options for countries to consider, a high-level political dialogue among countries to explore how, collectively, the objectives of energy for sustainable development might be achieved, and an early warning system of signposts to send an alert if the objectives are not being met.
- The project would be strengthened by wider participation of donors and countries.

D. Special programme for the Economies of Central Asia

- Representatives of SPECA countries presented their implementation of SDGs related to the thematic areas of the Working Group at national and subregional/transboundary levels. In particular, they discussed what is planned by countries and by intergovernmental organisations/partners and how SDGs could be implemented more efficiently through crossborder/subregional cooperation.
- The Secretariats of ESCAP and UNECE presented the results of programme implementation in the area of water-energy-environment in 2016-2017 and possible areas of work for 2018-2019. Opportunities for cooperation in the SPECA region to support the implementation of the Sustainable Development Goals were presented by international organisations such as CAREC, ICSD, International Water Assessment Centre, UNEP and national experts.

Annex III

Astana Ministerial Statement on Sustainable Energy[9]

Our Pledge

We, the Energy Ministers, met in Astana, Kazakhstan on 11 June 2017, to explore ways to accelerate the transition to a sustainable energy system. Energy plays a crucial role in global economic growth and underpins all areas of development. We recognize that it is essential for our nations to secure access to affordable, reliable, sustainable, and modern energy and to reduce greenhouse gas emissions from the energy sector for the world to develop sustainably. Improving efficiency and reducing emissions will be essential to meet environmental goals. We commit to those actions described herein that pertain to our national circumstances.

1. We support the development of national sustainable energy action plans aligned with our future energy needs, the 2030 Agenda for Sustainable Development, and the Paris Agreement, including notably agreed significant improvements in energy efficiency, reductions in greenhouse gas emissions from the energy sector, and ensuring energy access for all.

2. We take note of the initiative of Kazakhstan to establish an International centre for green technology and investment "Future Energy" in Astana, financed by the Government of the Republic of Kazakhstan and supported by voluntary extra-budgetary resources and expertise (including from interested organisations of the United Nations system such as UNDP, UNEP, UNIDO, UNECE, and UNESCAP) to support interested countries in the areas of energy market reform, energy efficiency, renewable energy, energy access, energy security, finance and investment, technology, and energy data, indicators and analysis and we recommend it explore collaboration with other respective international organisations and existing technology centers.

3. We support the development and dissemination of internationally recognized minimum energy performance standards in all sectors.

4. We will participate on a voluntary basis in the development of methods for public data collection, and the gathering and dissemination of appropriate data and indicators related to energy for sustainable development.

5. We will participate actively in international dialogue on technology, energy policy, and lessons learned to share best practices.

6. We will promote access to affordable, reliable, sustainable, and modern energy for all.

7. We call on the community of international organisations and other stakeholders involved in energy to coordinate their support for our efforts across the range of activities

[9] http://energyministerial.kz/906/uploads/2016/10/declaration_eng_print_ADOPTED.pdf
This Ministerial Statement was adopted at the Ministerial Conference "MEETING THE CHALLENGE OF SUSTAINABLE ENERGY" within Eighth International Forum on Energy for Sustainable Development on 11 June 2017 in Astana. The Ministerial Statement is a non-binding outcome document based on the ministerial dialogues held to enhance the understanding of sustainable energy and possible policy drivers to achieve a common goal on sustainable energy. The recommendations and solutions from the Ministerial Statement will be further integrated into a "Manifesto of Values of Expo 2017", which is planned to consolidate proposals of private sector, governments, academia and environmental organizations, business-structures to create a new model of energy.

set forth in this document. We would like to convene again under the auspices of the United Nations to assess the progress on our pledges.

What is at stake?

The Crucial Role of Energy for Sustainable Development

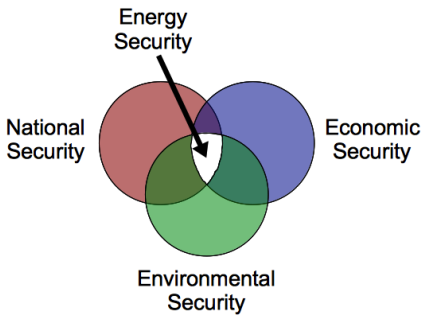
If the world is to develop sustainably, it will be necessary to ensure access to affordable, reliable, sustainable, and modern energy services while reducing greenhouse gas emissions and the carbon footprint of the energy sector. Energy is a fundamental need as it provides the essential services of cooking, heating, cooling, lighting, mobility, and operation of appliances, information and communication technology, and machines in every sector of every country to support decent life and work. Energy is used by doctors as they provide healthcare in clinics, it provides lighting for children to study, and when it is unavailable women (most often) are obliged to pass their time gathering wood to burn for cooking (which then degrades indoor air quality). Energy is the golden thread that weaves throughout the 2030 Agenda and is at the core of meeting the world's quality of life aspirations. The challenge is reconciling a tight emissions pathway with these aspirations. The 2030 Agenda represents an imperative for profound and immediate changes in how energy is produced, transformed, traded, and consumed as the energy sector accounts for 60% of total global greenhouse gas emissions. To avoid exceeding the amount of carbon that can be emitted that is consistent with the objectives of the Paris Agreement and to set the stage for future reductions in atmospheric greenhouse gas concentrations, all options for reducing net carbon emissions must be developed and pursued urgently to reduce energy's net carbon intensity.

The rate of improvement in energy efficiency, the deployment of net low carbon energy solutions, and the provision of sustainable access to modern energy services are insufficient. Energy's contribution to the 2030 Agenda will falter in the absence of concrete measures to improve energy productivity, rationalize energy use, optimize energy resources, and deploy both new energy technologies and sustainable energy infrastructure.

Critical Issues Dominate the Energy Agenda

There is no common understanding of what sustainable energy is or how to attain it. Today's national energy strategies reflect divergent economic development, resource availability and energy mixes. Each country sets its national energy strategy based on its perspectives on sustainable development, environmental protection, revenue needs, poverty alleviation, climate change mitigation, quality of life, and the like. As a consequence, multiple approaches and outcomes can be found in national plans.

- Energy security concerns impede improvements in technical, environmental, and economic efficiency, often by promoting energy independence instead of more efficient enhanced integration of energy markets.



- Fossil fuels play a significant role in the energy mix. Even under a climate change scenario that meets the target of the Paris Agreement, fossil energy will still represent an important share of the energy mix in 2050 and must be addressed whether through efficiency improvements or through appropriate emissions controls.
- Certain options for improving the overall performance of today's energy system are excluded for reasons of public perception, politics, imposed market distortions, or legitimate but possibly solvable concerns of health, safety and environment. Meeting

the energy requirements of the 2030 Agenda and the Paris Agreement will require addressing the range of obstacles.

- Transforming the energy system will require a shift in policy and regulation to treat energy as a series of services rather than as a series of commodities, but the political, regulatory, and industrial infrastructure of energy is anchored firmly in today's commodity system. The transformation will need to respect the vital economic interests of producers, consumers, and financiers to be effective.

What needs to happen?

Reshape Policies to Stimulate the Transition to a Sustainable Energy System

The objectives of energy sustainability are attainable and need not contradict more short-term considerations if the world embarks on a determined, collective effort. Reinventing the energy system to one in which 1) a systems perspective shapes overall policy and 2) the transformation of energy from a series of commodities to a series of services will not be instantaneous and starts with the system that is in place today. Action by international organisations, national governments and regulators, civil society, and private sector investors can accelerate the needed transformation.

Energy markets should be reformed so that energy prices reflect full costs, including emissions, while eliminating market-distorting subsidies throughout the system. The use of energy subsidies could be attenuated by exploring more efficient and effective ways to protect vulnerable groups or to promote new technology. Policy-makers should work to enable a transition from an energy commodity industry to an energy services industry as a means of accelerating the technical, economic, and environmental efficiency of the energy system.

Energy market reform will not happen unless energy sustainability is assured. A full range of normative instruments such as standards and best practice guidance is needed throughout the energy system including development of regional and international norms covering interconnections, interoperability and trading. It will be important to maintain an open dialogue among energy-producing, -transit and -consuming countries on energy security, technology and policy. Achieving greater interconnectivity and mutually beneficial economic interdependence will require investment in energy infrastructure projects to enhance energy efficiency, integrate renewable energy, and optimize energy resource utilization. Encouraging interconnection infrastructure projects among countries with complementary energy resources is a cost-effective way to enhance mutual energy security and energy sustainability.

Energy efficiency in most countries needs to improve more quickly. Improving the efficiency of the economy's energy system is one of the most cost-effective options for delivering on the sustainable development goals, but much potential remains untapped. Significant potential for improving energy efficiency exists worldwide: policies that artificially lower energy prices encourage wasteful consumption; production and consumption subsidies distort markets; housing stocks are poorly managed; land use management is inefficient; new participants face barriers to entry; there are inadequate norms and standards; and the statistics and information to manage energy use and track progress are incomplete. Also, there is often a lack of public awareness and education about the long-term economic and social benefits of action to improve energy efficiency and industrial productivity.

Universal access to modern energy services requires mobilizing adequate resources. Ensuring physical and economic access to quality energy services requires investment throughout the energy value chain, from primary energy development to end use. Enabling investment requires that governments have a long-term vision for providing sustainable energy services, and that they promulgate sustainable policies and regulations that allow

producers and consumers to respond to a dynamically changing energy market. Such a vision should be based on a total energy system perspective that includes provision of access to modern energy services for vulnerable groups. It also requires proper integration of the full slate of development goals (e.g., energy, gender, youth, and other vulnerable groups of people; the water-food-energy-ecosystems-health nexus).

***Renewable energy policies need to be redesigned from a systems perspective*.** Renewable energy is becoming cost-competitive with conventional energy and has significant potential for further cost reductions. They offer a way to reduce the net carbon intensity of the energy sector, improve energy security, provide energy access economically in remote areas, and encourage economic development. For energy exporting countries, renewable energy can help meet growing domestic energy demand while supporting stronger fiscal and environmental sustainability. Enhancing integration of renewables into the energy mix will be important as future energy systems are optimized both on- and off-grid. However, wider uptake of renewables requires addressing barriers to fair competition vis-à-vis conventional energy technology (without resorting to subsidies), implementing stable long-term energy policy frameworks in a future energy system context, and deploying financial and risk mitigation mechanisms. New solutions are needed to deploy renewable energy in buildings, industry and transport.

***Finance will be critical*.** The transformation of the energy system will involve mobilization of significant financial resources. It is also likely to alter the substantial financial flows emanating from today's energy system. It will be necessary to align investment incentives with the objectives of the 2030 agenda in order to improve investor confidence and incite transformational investment.

The future energy system will need new technology and new skills. Research and development and commercial introduction of new technology, capital, and management skills are essential to support the needed transitions. It will be important to extend international collaboration on research and development of new technology and exchange lessons learned about large-scale deployment of lower net carbon intensity energy sources.

Energy indicators for tomorrow. It will be vitally important to develop further appropriate indicators that show progress on energy for sustainable development in the context of the whole 2030 Agenda and its nexus challenges. Many countries need support to establish energy statistics programmes that monitor and report key energy production and consumption variables, and that are fully integrated into other economic and social national statistical efforts. It will be necessary to enhance international statistics on energy production, trade, and consumption patterns consistent with the desired future energy system and to strengthen the analytical capacity of the different interactions involving energy policy in order to provide innovative sustainable policy approaches to address multidisciplinary energy-related issues.

National and regional circumstances vary substantially. While each country will make its respective contributions to the 2030 Agenda and the Paris Agreement, there is no one-size-fits-all solution and each country will choose its approach optimally given its national circumstances.

Collaboration is essential. Countries are committed to implementing their respective nationally-determined contribution (NDC) to the Paris Agreement. There is significant value in international cooperation, strategic partnerships and functioning energy markets across regional corridors in the interest of all. Sharing experience and technology and encouraging cross-border investment will accelerate the transformation. Achieving the objectives will be facilitated by closer dialogue and collaboration among governments, the private sector, financiers, and civil society and among the various sectors that will interact to deliver on the 2030 Agenda.