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**Economic Commission for Europe**

Committee on Sustainable Energy

**Twenty-fifth session**

Geneva, 28-30 September 2016 and 19 January 2017

Item 6 of the Provisional agenda

**International Fora on Energy for Sustainable Development and Energy Ministerial**

Draft outcome document of the Eighth International Forum on Energy for Sustainable Development and Energy Ministerial

**Note by the secretariat**

I. Introduction

1. The Committee on Sustainable Energy (the Committee) at its twenty-fourth session welcomed and supported the offer by Kazakhstan to host a ministerial conference and the Eighth International Forum on Energy for Sustainable Development (the Eighth Forum) in Astana (ECE/ENERGY/99, para. 89). In consequence, the Governments of Azerbaijan and Kazakhstan have been collaborating with the sustainable energy subprogramme under the oversight of the Bureau to develop a concept, process and draft outcome document to support the energy ministerial to be held on 11 June 2017, on the second day of EXPO 2017 “Future Energy” and on the first day of the Eighth International Forum on Energy for Sustainable Development.

2. The Committee at its twenty-fifth session on 28–30 September 2016 then considered the proposal by the Governments of Azerbaijan and Kazakhstan to endorse the suggested concept for this event (documents ECE/ENERGY/2016/8 and ECE/ENERGY/2016/9) and recommended to conduct an open, informal, public, on-line consultation process involving all member States of all United Nations Regional Commissions, the Committee’s subsidiary bodies, all partners and interested stakeholders to refine the outcome document of the Eighth Forum and energy ministerial (ECE/ENERGY/2016/9, Annex).

3. The Committee further decided not to close the twenty-fifth session with the adoption of the report (ECE/ENERGY/107) but to adjourn the session with the objective to reconvene on 19 January 2017 to consider the revised outcome document for endorsement and to adopt the report of the twenty-fifth session.

4. 19 comments and recommendations were received through the on-line consultation process and can be found on the website[[1]](#footnote-2). They have been integrated into draft 2 of a ministerial statement (see Annex 1 of this document), which is presented to the Committee for endorsement, for subsequent approval by the United Nations Economic Commission for Europe (ECE) Executive Committee (EXCOM), for submission to the sixty-seventh ECE Commission session for endorsement.

5. The expectation is that ministers participating in the energy ministerial will commit to concrete actions to accelerate achievement of the energy-related Sustainable Development Goals.

6. The conference will be officially hosted by the Government of Kazakhstan. The Committee, the subsidiary bodies and all Regional Commissions have been invited to engage in the process.

II. Objective of the energy ministerial conference

7. The proposed ministerial dialogues 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. It will further provide an opportunity to explore how the United Nations system can help implement or pursue sustainable agendas putting to the fore the regional context. Can we design a pathway to a sustainable energy system wherein a successful regional outcome is a composite of national choices?

8. In particular, the ministerial dialogue has the following objectives:

(a) Raise the importance of the regional context in attaining sustainable energy goals;

(b) Solidify the understanding of the role of clean fossil fuels in future energy systems in the short- and medium-term;

(c) Raise awareness about different plausible pathways for countries;

(d) Bring the voice of Central Asia and the Caucasus to energy and climate discussions;

(e) Launch a “regional centre for development of green technologies and investment projects” (Annex 3).

9. The energy ministerial conference will offer the possibility to ministerial participants to share thoughts and experiences in plenary, followed by moderated roundtables on topics of their choice. The Eighth Forum, in consequence, will present ministers with a menu of options about what countries could do to attain the energy-related Sustainable Development Goals and implement national action plans based on a thorough analysis of the gap and the challenges ahead (Annex 2). The Eighth Forum and the ministerial conference are about understanding and then closing the gap quickly, seeking to advance solutions that promote energy efficiency and existing low-carbon energy technologies and policies.

III. Timeline and next steps

10. **28–30 September 2016**: Twenty-fifth session of the Committee on Sustainable Energy. The Committee endorsed the proposal for an on-line consultation process about the outcome document in preparation for the energy ministerial to be held under the auspices of the Eighth Forum on 11 June 2017 in Astana, Kazakhstan. The Committee decided to reconvene on 19 January 2017 to consider the comments and recommendations made through the consultation process.

11. **October 2016 to 2 January 2017:** Web-based consultation process. 19 comments have been received and have been published on the website.

12. **18–21 October 2016**: Seventh International Forum on Energy for Sustainable Development in Baku, Azerbaijan. This meeting brought together the five United Nations Regional Commissions with partners and allowed additional consultations to the proposed document. Document ECE/ENERGY/2016/8 and its Annex was adopted without changes and can be found on the website[[2]](#footnote-3) as the Baku Call for Action.

13. **18 November 2016:** Eighty-seventh meeting of EXCOM. EXCOM was informed of the Committee’s recommendations, invited to participate in the consultation process and engage in the preparations for the Eighth Forum and energy ministerial.

14. **9 January 2017**: Revised outcome document sent to ECE member States, Regional Commissions and partners for consideration before the resumed twenty-fifth session of the Committee on Sustainable Energy.

15. **19 January 2017**: Resumed twenty-fifth session of the Committee on Sustainable Energy. Consideration of the ministerial outcome document, closure of the session with the adoption of the report.

16. **2 February 2017:** Eighty-ninth meeting of EXCOM. Further consideration of ECE/ENERGY/2016/9.rev.1.

17. **26–27 April 2017**: Sixty-seventh Economic Commission for Europe session for potential endorsement of the Committee-approved recommendations and outcome document.

18. **11 June 2017**: Energy ministerial conference hosted by Kazakhstan in collaboration with partners.

19. **11–14 June 2017**: Eighth Forum, Astana, Kazakhstan.

20. **10 June – 10 September 2017**: EXPO 2017 “Future Energy”, Astana, Kazakhstan.

21. **26–28 September 2017**: Twenty-sixth session of the Committee on Sustainable Energy to report on progress made and present concrete actionable outcomes from the ministerial meeting.

Annex I

Ministerial Statement

[Draft 2]

Access to affordable,

reliable, sustainable, and modern energy

***Our Pledge***

We, the Energy Ministers of [countries], met in Astana, Kazakhstan on 11 June 2017, to explore ways to accelerate the transition to a new, sustainable and fair 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. We recognise the importance of fossil fuels in the transition to a future sustainable energy system but note that improving power plant efficiency and reducing emissions will be essential to meet environmental goals. We commit to those actions described herein that pertain to our national circumstances (Annex 2).

1. We will develop national sustainable energy action plans aligned with our future energy needs, the 2030 Agenda for Sustainable Development, and the Paris Agreement, including notably significant improvements in energy efficiency, reductions in the net carbon intensity of the energy sector, and reductions in emissions of methane from the energy sector.

2. We support the establishment of sustainable energy centres in our regions to support our 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 (Annex 3).

3. We support the development and dissemination of internationally recognized minimum energy performance standards in all sectors (Annex 4).

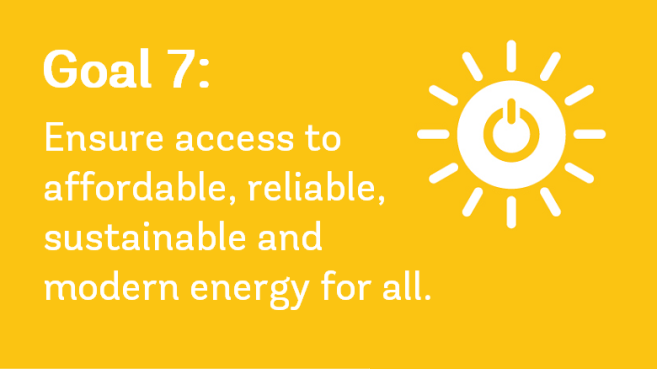
4. We will participate in the gathering and publication of appropriate data and indicators related to energy for sustainable development.

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

6. We 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 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 and to invite other countries to participate in the United Nations energy ministerial meetings.

**What is at stake?**

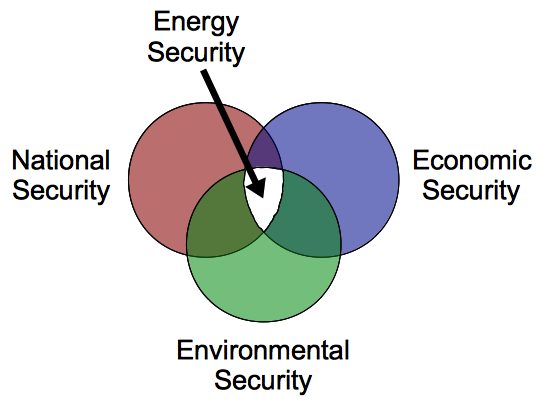
***The Crucial Role of Energy for Sustainable Development***

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. 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 dominate the energy mix and underpin today’s energy access. Conversations about energy efficiency and renewable energy neglect this reality, and the neglect slows attainment of objectives. Even under a climate change scenario that meets a 2° target, fossil energy will still represent 40% of the energy mix in 2050 and must be addressed whether through efficiency improvements or through 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 safety or environment (e.g., carbon capture and storage, shale gas, nuclear power, using natural gas in transport). Meeting the energy requirements of the 2030 Agenda and the Paris Agreement will require addressing the range of obstacles.
* Truly 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 security 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.

***Energy productivity in most countries needs to improve more quickly***. Improving the productivity 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. Improving energy efficiency is a least cost means of meeting growing energy demand in most countries. It contributes to energy security, a better environment, improved quality of life, and economic well-being. A focus on how improved energy productivity can put energy to its highest value uses can help governments move their industries up the economic value chain, thereby promoting better quality jobs and growth while reducing emissions. To achieve these results, the multiple benefits of energy efficiency such as the potential for improved energy access, improved reliability, and fiscal sustainability must be better understood. 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.

***Equitable 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, and youth; 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.*** 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 low carbon energy sources.

***Energy indicators for tomorrow***. It will be vitally important to develop 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 collect data 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 contribution 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.

Annex II

***Action Agenda***

The following actions represent a menu of options that countries will wish to consider as they develop their sustainable energy action plans. The choice of approaches will depend on specific national circumstances.

Access to Modern Energy

1. Significantly accelerate the required energy transition while ensuring a high level of energy service reliability and equitable energy access.

2. Mobilize needed financial, technical, and managerial resources to provide universal access to modern energy services and ensure proper integration of other sectors and other development goals into national sustainable energy plans.

3. Develop and disseminate regional and international standards or other normative instruments throughout the energy system to improve its technical, economic, and environmental efficiency, drawing on existing best practices and standards.

4. Establish the right policy and regulatory environment that can attract the private sector into the off-grid renewable energy market that can pioneer the establishment of delivery channels, innovate with products and services, and unlock substantial private capital.

5. Accelerate the switch from traditional biomass to cleaner fuels, including liquefied petroleum gas, biogas, and electricity, for cooking and heating, and support efforts to disseminate improved cooking stoves, and implement effective household energy programs.

6. Promote the use of quality-of-service regulation as a means of aligning the needs of suppliers and consumers of energy services and encourage the introduction of business models based on competitive companies offering sustainable energy services.

7. Develop well-functioning, resilient and interlinked energy markets with market-based pricing and with greater transparency, flexibility and liquidity.

8. Rationalize the use of energy subsidies by exploring efficient and effective ways to protect vulnerable groups.

9. Phase out inefficient energy subsidies that create market distortions and encourage wasteful consumption by 2025.

10. Promote clean public and mass transport systems and strengthen vehicle inspection procedures, and support efforts to phase out leaded fuels.

Energy and Climate Change

11. Implement strategic measures to develop energy systems that allow for sustainable economic diversification and growth alongside deep reductions in greenhouse gas emissions. Reduce systems costs with market reforms, normative instruments (such as standards), and business models that embrace demand responses, supply flexibility, and enable distributed generation, storage technology, energy efficiency, and efficient transmission and distribution.

12. Institute well-functioning carbon markets or other mechanism to establish a price on carbon to promote low carbon growth. Mechanisms for carbon trading should be transparent and understandable for all.

13. Ensure that policy supports the 2030 Agenda to increase substantially the share of renewable energy in the global energy mix and double the global rate of energy efficiency improvements.

14. Ensure policy parity among all carbon-reducing technologies, including renewables, clean fossil, and, to the extent, countries wish to pursue the option, nuclear power. Observe and encourage projects to reduce greenhouse gas emissions that are not included in the current national plan.

15. Deploy the best available technologies and practices in clean energy and enhance research and development of innovative technologies. Encourage both sustainable development of untapped national resource potential and establish a roadmap for the gradual phase-out of carbon emitting technology.

16. Endorse the World Bank’s [“Zero Routine Flaring by 2030” Initiative](http://www.worldbank.org/en/programs/zero-routine-flaring-by-2030#4).

17. Apply best practices to monitor and reduce emissions of methane from the extractive industries.

Energy and Resource Productivity

18. Reshape energy markets so that energy price signals and energy policies are aligned with sustainable deployment and use of energy resources, including advancing interconnected global markets such as LNG that can provide outlets and markets for gas that might otherwise be vented or flared.

19. Implement economic growth strategies that support greater energy and resource productivity through energy efficiency measures, economic diversification and technological innovation plans to promote greater economic value from energy use while reducing carbon emissions.

20. Explore ways and investigate existing best practices for energy suppliers to sell energy services rather than energy products to accelerate energy efficiency uptake.

21. Enhance cross-sectoral national planning, both urban and rural, to improve energy efficiency, including in housing, transport, commercial activities, water, waste, and municipal utility infrastructure and to enhance synergies between energy efficiency and renewable energy measures. Limit permissible heating/cooling loads in new buildings to 10 W/m2 (or annual heating/cooling demand of 15 kW/m2 of treated floor area) to reduce energy requirements sufficiently to permit renewables or zero carbon sources to meet the remaining energy loads with total energy demand strictly limited.

22. Increase efficiency in energy infrastructures, including minimizing oil and gas losses in extraction, processing, storage, loading, dispensing and transport and gas emissions from gas systems, and develop efficient power generating facilities;

23. Disseminate technology-driven energy performance standards and pursue ever-tightening, enforced minimum energy performance standards in all sectors. Establish testing and labelling standards and procedures that meet recognized international requirements and that generate transparent information about them. Harmonize official energy efficiency labelling for mass consumer equipment.

24. Limit commercialization and sales of appliances and equipment that do not meet internationally agreed minimum standards by 2030.

25. Deepen collaboration and partnerships between and among international organisations, national administrations, private sector, and civil society to enhance energy and resource productivity.

26. Establish education programmes to train professionals through pilot projects in all economic sectors on ways to reduce energy use and provide information to the public with respect to energy efficiency and family budgets.

Energy Investment Framework Conditions

27. Develop energy infrastructure, markets, and trading arrangements that are resilient in the face of natural or geopolitical disruptions, including through well-functioning and transparent markets, diversified energy fuels, sources and routes, enhanced energy efficiency, and enhanced demand and supply response to price swings.

28. Establish clear and enduring investment mechanisms to facilitate investments in secure and sustainable energy, including investment to encourage clean energy technology uptake, energy efficiency, upstream investment, and quality infrastructure investment.

29. Maintain an appropriate dialogue among energy-producing, -transit and -consuming countries on energy security, technology and policy.

30. Promote regional connectivity of energy infrastructure projects to enhance energy efficiency, to integrate renewable energy, and to optimize energy resource utilization in a sustainable manner. Enhance efforts to make regional energy integration a reality. Encourage interconnection infrastructure projects between countries with complementary energy resources as a cost-effective way to enhance mutual energy security and stabilize energy systems.

31. Engage in dialogue and training with financial institutions to align investment incentives with the objectives of the sustainable development goals, including climate change. Create structural, institutional and regulatory framework conditions that enable investment throughout the value chain that reward efficient provision of energy services rather than use of energy resources.

32. Establish capacity building and qualification programmes for developers, engineers, technicians and workers involved in the design of bankable project proposals to be submitted to institutional, private investors, national and international financial institutions.

33. Support renewable energy project development and help projects move from initiation to financing by making markets more transparent and actively facilitating interaction of market players.

Technology

34. Invest in clean energy innovation, private sector engagement, and dissemination of advanced technologies to facilitate joint research and information sharing. Encourage collaboration among relevant research laboratories and institutes to promote the development of innovative clean energy technology.

35. Encourage transition of the governance systems of the electricity sector to enable innovative technologies and new business models to take advantage of the opportunities that the energy system of the future can provide.

36. Improve the design, operation and planning of the power system in order to enable integration of higher shares of renewable power generation. Establish the regulatory frameworks to account for the cost structure of variable renewable energy integration, to allow for new services and revenue channels, and to support new business models.

37. Welcome sustainable energy centres such as the one proposed for Astana to achieve the goals of the Clean Energy Ministerial Mission Innovation and like approaches to encourage technology development, promotion, transfer and capacity building towards a green economy.

38. Support research and development and the commercial introduction of clean energy technology, capital, and management skills to support needed transitions.

39. Facilitate the provision of affordable technologies to oil producing and exporting countries for transforming solid fuels to liquid or gaseous fuels; controlling gas flaring and venting; utilizing carbon capture and storage technologies; and applying technology to recapture the energy contained in waste.

40. Encourage sustainable manufacturing of energy efficient and cleaner energy equipment that contributes to cost-effective and WTO compliant job creation.

41. Establish capacity building and qualification programmes for engineers, technicians, financiers, and workers involved in the design and implementation of energy efficiency and cleaner energy solutions.

Energy Data, Indicators, and Analysis

42. Collaborate with the United Nations regional commissions and agencies and other international partners to develop appropriate indicators of progress to the energy-related sustainable development goals, to build needed capacity to collect the sound data needed to populate the indicators, and to provide input systematically to track progress towards the aspirations of the 2030 Agenda and the Paris Agreement.

43. Create a unified system of indicators of sustainable development to enable, at regional, national and international levels, comprehensive assessment of the current status of the situation in the field of sustainable energy, as well as threats and opportunities. Such a system will allow developing strategic actions to achieve the goals.

44. Consider the different interactions involving energy policy, especially the water-energy nexus and the water-food-energy nexus, in order to provide appropriate sustainable policy approaches to address multidisciplinary energy-related issues.

Annex III

Regional Centre for development of green technologies and investment projects

Background

At the opening of the 70th session of the UN General Assembly, H.E. Nursultan Nazarbayev, President of Kazakhstan, informed the General Assembly that in support of the UN initiative "Sustainable Energy for All" an international EXPO on the theme “Future Energy” would be held in Astana in 2017, and he suggested opening in Astana an International Centre for the development of green technologies and investment projects under the auspices of the United Nations.

Currently there is no international authority working to accelerate global technological development and uptake. Organizations such as UNDP, UNIDO, regional European, African and Pacific associations, achieve certain successes within their mandates, but their mandates are insufficient to achieve significant global breakthrough. There is a need to intensify technology development to facilitate access to the technologies needed for sustainable development.

One of the main proposals being considered to facilitate the transfer and diffusion of climate-friendly technologies is the creation of several major low carbon technology innovation and diffusion centres in developing regions. These centres would work in cooperation with local and regional academic organizations, businesses and governmental organizations to ensure the cost-effective transfer of technologies and to catalyse the large commercial investment required.

This proposal represents the initial steps of an integrated regional action for the transfer and diffusion of climate friendly technologies through international cooperation.

Objectives

This project seeks to demonstrate the validity and effectiveness of this concept by creating a centre focused on small scale regional green technologies and investment projects and by implementing a specific set of activities within a limited time frame (three to four years), including monitoring progress in selected countries of the region including the country where the Centre will be located.

The centre is conceived to be supported directly by and linked to at least five national, regional and international organizations: a national organization of the country where the Centre will be located (e.g. Kazak Ministry of Energy); a regional university located in the same country (e.g. Nazarbaev University); a renowned international university (e.g. University of Cambridge, MIT, etc.) an international climate change and technology development and commercialization organization (e.g. the Carbon Trust Co.); and a national or regional private company (e.g. ExxonMobil).

The Centre will implement research-oriented activities in the fields of sustainable development, climate change, and related technology transfer and technology diffusion. The Centre will strengthen the capacity of nationals from participating countries through academic activities, case studies, and assessments of national and regional climate change impacts and technology needs. The transfer of know-how, experiences and lessons learned will effectively take place both North-South and South-North: from the international institutions to the regional and national organizations by demonstrating specific mechanisms and approaches effectively implemented to overcome technology transfer barriers, and from the regional and national experts to the international institutions by identifying specific issues and barriers affecting the region and by demonstrating mechanisms that have been effective in the transfer of similar technologies in the past.

The Goal

The overall goal of this project is to establish a network of regional and international experts and donors to share information, with efforts to promote an overall solution to the sustainable energy consumption in Eurasian region. The network will be designed to strengthen the linkages for information sharing, training, cooperative assistance and promotion of sustainable energy development among official and experts; to increase awareness of the contributions that advanced energy technologies can make to supporting sustainable development, and of the role that international partnerships can play in the transfer of technologies accompanied by an increasingly favorable investment environment; and to facilitate and assist in the development of demonstration projects focusing on advanced energy technologies for sustainable development in Eurasia.

Activities

The main activities of the project will include the following:

(a) Establishment of a New Entity (Centre) to promote the development of green technologies and investment projects; the Centre to be established in Astana, Kazakhstan with the support of the Government;

(b) Formation of a Network and Task Force on Transfer and Diffusion of Advanced Energy Technologies; The Network will consist of institutes and experts from various countries as well as UNECE. The Network members will designate representatives to serve on a Task Force that will convene semi-annually to plan Network activities;

(c) Enhancement of Regional and National Capacity. The Network, through the Task Force and with the assistance of UNECE, will:

(i) Organize and manage annual seminars on such topics as relevant experiences of existing renewable energy, energy efficiency, advanced fossil fuels technologies and other sustainable energy issues.

(ii) Organize activities for the Dissemination of Information on the Transfer and Diffusion of Advanced Energy Technologies to worldwide potential partners and beneficiaries in order to promote their participation.

(d) Development of a plan for Demonstration Projects in the UNECE region.

Based on its collective experience, the Network, through the Task Force and with the assistance of UNECE, will oversee the drawing up a plan for a Demonstration Project, which will require that it undertake planning meetings, undertake visits to one or more promising sites for the project implementation, and propose the engagement of experts to undertake specific tasks that contribute to the development of the plan. Demonstration Projects should include all types of sustainable energy issues: energy generation through advanced fuel technologies, renewables, and energy efficiency;

(e) Fund Raising. Efforts will be made by both UNECE and the Network to further develop and expand the above activities by raising additional funds from other sources, including intergovernmental organizations, foundations, Governments and the private sector.

Expected accomplishments

1. Establishment of collaborative sustainable network in UNECE region to promote energy resources management for Sustainable Development.

2. Increased level of knowledge and awareness of Governments and other stakeholders of innovative legal and regulatory framework, new financial incentives and mechanisms for energy projects, modern equipment and technologies.

3. Finalized Feasibility Studies for the full-scale demonstration projects.

Conclusion

The proposed Centre would attempt to improve national, regional and international understanding of contemporary developments of green technologies and investment projects in Eurasia. Over the coming years, the Centre, through the Network and Task Force, would provide national and international audiences with invaluable, on-the-ground analysis from the local and international staff.

As an international organization, the Centre will facilitate more effective and efficient knowledge management in the energy technologies sector focusing on specific areas of interest within the broader themes of governance, economic and social development, and the environment. It will systematically capture and organize knowledge and experience gained from staff, governmental counterparts, and development partners in order to make this knowledge more readily accessible and to create linkages between agencies, groups and communities working on similar topics. It will focus on (1) institutional strengthening that will support advanced energy technologies; (2) energy policy reform; (3) environmental and related infrastructure; (4) promoting greater efficiency of energy distribution and use; (5) fostering the commercialization and use of advanced energy technologies and demonstrating appropriate technologies to reduce energy-related environmental degradation and mitigate emissions of greenhouse gases; and 6) stakeholders’ roles and participation.

With a staff comprised of primarily analysts from Kazakhstan as well as international experts and visiting fellows, the Centre would be “Eurasian think-tank with an international face”.

Annex IV

Framework Principles for Building Standards

Global Transformation of Buildings in the Built Environment: Framing the design, delivery and operation of buildings as an integrated, thermodynamic and environmental system

I. Introduction

**The *2030 Agenda* and *the Paris Agreement* set a vision for a sustainable future.** The quest for sustainability recognizes that the world is at present on an unsustainable path and that urgent action is imperative. The immediate question is which actions might be decisive.

**Buildings are central to meeting the sustainability challenge.** In the developed world, buildings consume over 70% of the electrical power generated and 40% of primary energy, and are responsible for 40% of CO2 emissions from combustion. Projected global economic advances imply vast growth in global building floor space and the total electricity requirements. Those requirements cannot be met by renewable energy technology alone, despite recent improvements. The energy demand of buildings must be addressed, but the capability to meet this challenge is in place.

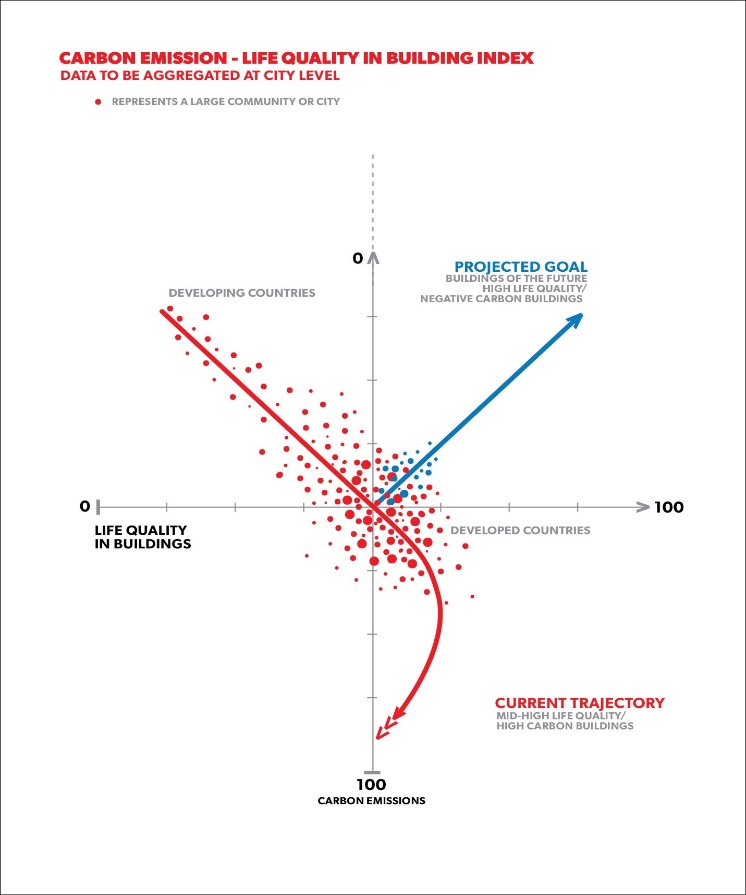
**Standards are an effective instrument for addressing energy efficiency in buildings.** Development and deployment of standards support the achievements of the targets set by several international initiatives such as energy-related Sustainable Development Goals, the Sustainable Energy for All Initiative, the Geneva UN Charter on Sustainable Housing.

The concepts set forth herein go well beyond the incremental, components approach of existing building standards. Rather, they represent a principles-based performance guidance for building energy standards that is outcome-based (i.e., anchored in energy actually consumed) and designed to project a vision of holistically designed and operated, ultra-high performance buildings as part of an integrated sustainable energy system.

II. Goal

It is essential that the energy required by buildings be reduced to a level that can be supplied largely, perhaps exclusively, by non-carbon-based energy. While further improvement in renewable energy technology and storage is to be expected, the results will be more robust if buildings are transformed fundamentally as well in terms of their energy performance. Limiting heating/cooling loads to 10 W/m2 or, annually, heating/cooling demand of 15 kW/m2 of treated floor area reduces loads sufficiently to permit renewables or zero carbon sources to meet the remaining energy loads with total energy demand strictly limited.

Figure 1 illustrates the strategic situation. Development to date has depended on harnessing energy generated largely from carbon-based fuels to improve quality of life – including life quality in buildings. As countries develop, buildings increase their energy consumption along with their carbon emissions. Economic growth and the quality of indoor environments have both been dependent on increased primary energy utilization. Shifting that reliance decidedly to renewables requires a holistic, systems approach to building design, delivery and operation and a paradigm that envisions buildings as energy generators and not primarily as energy sinks.



**Figure 1**

The 2030 Agenda creates the necessity and the opportunity to transform our built environment – to improve life quality while radically reducing energy requirements. At costs equal or close to those of traditional buildings, it is possible with today’s technology and with a holistic approach to transform our built world into one that aligns with the highest standards of health, comfort, well-being and sustainability including improving energy productivity and reducing CO2 emissions.

III. The Principles

**The principles required for an era of truly sustainable buildings** emerge from building science, materials science, digital science, information and communication technology and more. The principles also include the accumulated lessons learned and best practices of owners, designers, engineers, builders, managers, policy makers, and more. The principles will drive a deep shift in the building industry paradigm from fragmented and serial to holistic and integrated.

**The most fundamental principles can be ordered into primary clusters.** They cannot be prescriptive because the vast diversity of circumstances and conditions experienced around the world precludes prescription. Rather, the principles need to be axioms for guidance, indicating useful criteria to planners, builders, and the entire building delivery and management chain as elements of innovative sustainability strategy.

***Inspiring innovation* is the primary operational goal of these principles.** Innovation is a market viable, creative response to a genuine but latent demand in the consumer population.The world’s diversity demands solutions adapted to time, place and circumstances. Innovation in creative design, adaptation, and management is the fuel of sustainability.

**The most elemental principles of sustainable buildings can be clustered under four headings:**

A. Strategic – Buildings must be:

* **Science-based**: designed, constructed, and managed on demonstrable knowledge
* **Consensus-based**: realize the latent sustainability demands in the populations served
* **Community-based**: integrated with their built environment life-cycle
* **Market-based**: cost effective and profitable to activate private investment, entrepreneurs
* **Data-based**: performance monitored with feedback loops to operations and design tools
* **Performance-based**: evaluated by genuine system outcomes, not component prescriptions

B. Design – The conception and delivery of buildings must be:

* **Holistic:** comprehensively integrated for goals incorporating sustainability
* **Systemic**: the building conception based on building systems and subsystems
* **Integrated**: leveraging interior and exterior system and subsystem opportunities
* **Collaborative**: engaging all stakeholder in design processes under a “master builder” with shared responsibility for meeting energy and indoor environment performance metrics
* **Economic**: high performance buildings at or near parity (or lower) cost compared to 2016
* **Sustainable**: materials, equipment, construction, management and retirement practices
* **Self-aware**: of deviations (positive and negative) from expected performance

C. Management – Building must be maintained over their life-cycle:

* **Code driven**: local adoption of advanced global-sustainable building standards
* **Professionalized**: training-based and with ethos of sustainability & social responsibility
* **Work-force supported**: trained in technology/skills for construction, design & maintenance
* **Data-linked**: advanced building information management capacity
* **Oversight**: ongoing performance evaluation and improvement
* **City-scaled**: information analysis, enforcement, and incentives at city level

D. Best Practices

* **Modelling**: science based performance prediction and analysis
* **Commissioning & Recommissioning**: publicly disclosed building performance verification
* **Benchmarking & Monitoring**: comparative performance analysis
* **Certification, Labelling & Valuation**: ensure energy performance incorporated in asset value
* **Financing**: motivating capital to support a new building paradigm
* **Life-cycle**: long term analysis, improvement, and investment in building performance

E. Implementation

**The world has an imperative to meet the sustainability challenge.** Transformative change in buildings is possible. The capabilities to create a new world of buildings and energy is in hand or within reach. Progress will require follow-on action in five areas to support the *Framework* and make its vision a reality:

* **Dissemination**: national, regional and municipal leaders in the public, private, research and education sectors must be made aware of the framework – its vision, logic, practicality, and advantages.
* **Education**:information, guidance, instruction, and avenues to ongoing dialogue and knowledge resources must be provided to policy, market, and knowledge stakeholders to foster local development of building standards, codes and practices aligned with the *Framework*.
* **Research**: through collaborations among leaders in science and technology, focused on the frontier challenges in such areas as: (1) building-grid interface; (2) power generation and distribution; (3) materials, design, construction, finance, management and maintenance; (4) energy use management, and (5) integrated urban systems and life cycle management.
* **Consultation**: formal and informal channels with local policy, market, and knowledge stakeholders for evaluation of impact, dialogue on in impact strategy, addressing discovered or unanticipated challenges, and cultivating global consensus in support of the *Framework*.
* **Participation**: networks of support and engagement among leading corporations, foundations, universities, professions, civil society and others with the array of resources – intellectual, experiential, financial, and relational – that will be required to make transformation a grass roots or deep market movement.

F. Conclusion

**The 2030 Agenda and the Paris Agreement have defined vital goals.** Their overarching vision is attainable but at risk without deep, urgent action. Progress will require stakeholders to assume responsibility, to assist and support the United Nations’ sustainability agenda. The impact will be measurable in safety, prosperity, expanded markets for innovation, expanded frontiers for science and technology, and the creation of a new reality.

The *Framework Principles for Building Standards* are a practical step in bringing the building-energy nexus into the very fabric of the sustainability strategy. That nexus represents a decisive equation in the formula for sustainable development. For it to be impactful it must be support by a knowledge-based consensus. To create that consensus is at the heart of the task ahead.

1. https://www.unece.org/energywelcome/committee-on-sustainable-energy/committee-on-sustainable-energy/energycse-consultation-process/comments-received.html [↑](#footnote-ref-2)
2. https://www.unece.org/energywelcome/areas-of-work/energy-efficiency/meetings-and-events/energy-efficiency/energy-efficiency/2016/seventh-international-forum-on-energy-for-sustainable-development/docs.html#/ [↑](#footnote-ref-3)