United Nations ECE/ENERGY/2016/16

Economic and Social Council

Distr.: General
19 July 2016

Original: English

Economic Commission for Europe

Committee on Sustainable Energy

Twenty-fifth session
Geneva, 28–30 September 2016
Item 4 of the Provisional Agenda
Report on how the subsidiary bodies contribute to meeting the energy-related Sustainable Development Goals

Mapping of the Sustainable Energy subprogramme processes and activities that support countries in achieving the Sustainable Development Goals

Note by the Secretariat

I. Introduction

1. This document maps activities carried out under the Sustainable Energy subprogramme of the United Nations Economic Commission for Europe (ECE) that support countries in their pursuit of the Sustainable Development Goals (SDGs), as set out in the 2030 Agenda for Sustainable Development (2030 Agenda). It describes activities that support the follow-up and review of 2030 Agenda across the SDGs and aim to help countries develop national action plans for SDG implementation.

2. The work of the Sustainable Energy subprogramme is carried out through international policy dialogue, normative work, capacity-building and dissemination of good practices and lessons learned. Activities concentrate on the areas of energy efficiency, cleaner electricity production, renewable energy, coal mine methane, natural gas, resource classification, and energy security.

3. This document explores cross-cutting support provided to countries, including with respect to follow-up and review at the regional level and reflecting the integrated nature of 2030 Agenda. Processes and activities are then examined goal-by-goal, with reference to relevant targets for the sustainable energy subprogramme under each goal.

II. Energy in the United Nations Economic Commission for Europe region

4. The ECE region produces 40% of the world's energy while consuming 45%, is home to important energy industries, produces nearly 50% of global economic output, and is

dominant in the world's financial infrastructure. The region is very diverse, comprising high and low income countries, countries that are energy rich and energy poor, and countries that are in the midst of economic transition. The region has the potential for economic competitive advantage compared to other regions of the world given the relatively modest distances between energy supply sources and energy demand centers. Full integration of the region's energy markets under an efficient framework would significantly improve the sector's technical, social, economic, and environmental contribution.

5. Fossil fuels comprise 60% of primary fuel in the ECE region, making the ECE region one of the largest emitters of greenhouse gases, accounting for about half of global emissions, and there is no plausible scenario in which their share of the energy mix drops below 40% by 2050. Building a sustainable energy system will involve a substantial transition from what is in place today in the ECE region. Improving efficiency relates not only to consumer-level energy efficiency issues, but also to upstream energy efficiency in production/generation, transmission and distribution. It is an opportunity to accelerate change from the traditional model of selling energy commodities to one of providing energy services. Growth in distributed generation, shaping energy demand through information technology, separating time of production from time of consumption through energy storage, and improving management of an integrated system are all indicators of an energy revolution that is underway. The development of smart energy networks with common rules of access and operation is an important opportunity to enhance the collaboration among technologies, thereby enhancing the cost-effective penetration of lower-carbon technologies, improving the resilience of the energy system, and improving quality of life for all.

6. Ensuring sufficient, reliable, affordable, and environmentally responsible supplies of energy for sustainable development is a key challenge for the countries of the ECE region. The transition to a sustainable energy system is an opportunity to improve energy efficiency from source to use, minimize environmental impacts, reduce carbon intensities, and correct energy market failures. The ECE region comprises diverse countries, and policies and programmes designed to achieve the sustainable development goals will necessarily reflect national circumstances and priorities.

7. A challenge in reporting on progress is the lack of quality data for an appropriate set of indicators. The Global Tracking Framework (GTF) report for 2015 using available indicators concluded that overall, global progress on access, efficiency, and renewables from 2010 to 2012 fell well short of what is needed to attain the energy-related sustainable development goals by 2030.

III. Cross-cutting processes

8. The activities of ECE's Committee on Sustainable Energy are conceived to ensure access to affordable and clean energy for all and to help reduce greenhouse gas emissions and the carbon footprint of the energy sector. Through its groups of experts, ECE develops normative instruments, including work on standards and best practice guidances in energy efficiency, renewable energy, natural gas, clean electricity, and coal mine methane. ECE helps countries improve management of their natural resource endowments through the United Nations Framework Classification and has developed recommendations to ensure the future availability of carbon capture and storage. Further, the energy-related sustainable development goals extend well beyond SDG7, as noted in this document, and it is of critical importance that the work of the Committee on Sustainable Energy be coordinated with and embrace the activities of other actors within ECE, within the broader United Nations family of organizations, and with other stakeholders acting in these areas.

9. ECE is extending its work in three critical areas:

- reconciling the reality of fossil fuels' enduring share of the energy mix with the need to address climate change;
- enhancing integration of the region's energy markets, and;
- facilitating the transition to a sustainable energy system.

10. The Committee on Sustainable Energy undertakes certain activities and oversees cross-cutting activities:

- **International Fora on Energy for Sustainable Development**. Since 2014 these fora have been organised by all five United Nations regional commissions. In 2014, the Executive Secretaries of the regional commissions signed the Hammamet Declaration (http://www.unece.org/fileadmin/DAM/energy/se/pdfs/ee21/Forum_November_Tunisia/

  Joint_Statement_Fifth_International_Forum_Final_All.pdf). The transition to a sustainable, reliable, and affordable energy system can be accelerated if member States implement in a concrete fashion the measures called for in the declaration. The declaration proposed a set of economically-rational actions to help countries meet their sustainable development and climate goals.

  The annual international fora on energy for sustainable development have been designed to explore the policy options that countries might implement, outline the assistance that the United Nation's regional commissions can provide (http://www.unece.org/fileadmin/DAM/energy/se/pdfs/eneff/6th_Forum_Yerevan_Sept.2015/IFESD.6_Action.Plan_Joint.Statement.pdf), report gaps between countries' ambitions and their actions, and assemble the countries of the region to adjust their actions to meet the sustainability and climate goals.

  The Seventh forum will take place in October 2016 in Baku, Azerbaijan, and will explore gaps between countries' ambitions and their actions. The Eighth Forum will take place in June 2017 in Astana, Kazakhstan and will include a ministerial event at which countries may agree on specific actions to ensure attainment of the sustainability and climate goals.

- **Pathways to Sustainable Energy**. ECE is working with member States to explore what sustainable energy means for the region from the perspective of reducing the environmental footprint of energy while assuring the energy needed for sustainable development. The dialogue is designed to support stakeholders in identifying activities needed to achieve the sustainable development and climate goals from both a political and a technical point of view.

- **Global Tracking Framework and Readiness for Investment in Sustainable Energy**. These two activities are led by the World Bank, and ECE is supporting both for the development of regional reports. The work is intended to identify gaps in attainment of objectives and opportunities for acceleration based on jointly-developed indicators for tracking progress.

- **Methane Management in Extractive Industries**. ECE is working with key partners to develop best practice guidance for a) monitoring, recording, and reporting methane emissions; and b) abatement of methane emissions in extractive industries. Proper management of methane from source to use in extractive

industries will be a cost-effective means of reducing emissions of an intensive greenhouse gas.

IV. Goal by goal

11. This section presents the work undertaken by the sustainable energy subprogramme in support of relevant SDGs, including specific, concrete activities that will support countries in their efforts.

A. Goal 1: End poverty in all its forms everywhere

12. Access to modern energy services is an essential element of ending poverty. Access has three distinct components: 1) the share of populations connected to energy networks; 2) quality of service; and 3) affordability. Regarding the latter, if market-distorting subsidies (for fossil fuels, renewables, carbon emissions, end-users, and so forth) were removed, then prices would rise, rendering transformative investments more attractive but impairing near-term affordability. The ECE region has high electrification rates, from 98.6 to 100 percent. A major issue revolves around connecting remote, mountainous, or sparsely populated areas to central electricity grids, which is unlikely to be a cost-effective solution. When there is a lack of effective access to energy services, one can refer to energy poverty. Energy poverty causes indoor pollution and waste of productive time on collecting fuel to meet basic needs.

13. ECE's work related to access can be found in the Group of Experts on Renewables (in which promoting renewables in distributed structures is one approach to ensuring supply access), in the Group of Experts on Gas (in which work on enhancing the uptake of renewables also explores distributed generation applications and work on Liquefied Natural Gas (LNG) considers the role of small scale LNG to provide access to modern energy services without costly, large scale infrastructure), in the Group of Experts on Energy Efficiency (in which business models focus on delivering quality of life), and in the Expert Group on Resource Classification (in which governments are provided a tool with which to optimize management of their national endowments of energy resources, with positive implications for local economies, employment, royalties, and tax revenues).

B. Goal 6: Ensure availability and sustainable management of water and sanitation for all

14. Energy issues related to water include ensuring water quality (treatment of water, including pumps and filters), delivering of water (pumps), and development of hydroelectric facilities in the context of multiple uses of water resources. All of these energy-related activities involve providing access to sustainable energy.

15. ECE's work related to access can be found in the Group of Experts on Renewables (in which promoting renewables in distributed structures is one approach to ensuring supply access), in the Group of Experts on Gas (in which work on enhancing the uptake of renewables also explores distributed generation applications and work on LNG considers the role of small scale LNG to provide access to modern energy services without costly, large scale infrastructure), in the Group of Experts on Energy Efficiency (in which business models focus on delivering quality of life), and in the Expert Group on Resource Classification (in which governments are provided a tool with which to optimize management of their national endowments of energy resources, with positive implications for local economies, employment, royalties, and tax revenues).

16. The nexus between renewable energy and water is also addressed by the Group of Experts on Renewable Energy through interdivisional cooperation with the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention).

17. ECE's work related to hydroelectric facilities can be found in the Group of Experts on Renewables which is exploring means of increasing the share of renewable energy sources in the energy mix and in the Expert Group on Resource Classification, which is developing specifications for inclusion of water resources in the United Nations Framework Classification (UNFC). An earlier version of UNFC is used to manage water resources in Ukraine. Discussions are underway to provide water resources specifications in UNFC for classification, management and reporting of water resources.

18. Environmental impact analysis is part of detailed studies within the UNFC, where management of potential contaminants of extractive operations is addressed comprehensively. UNFC can be used as an interconnected tool with other systems to manage impacts on water systems and monitor progress. Environmental impact analysis also looks into reducing water use, and maximum possibility of water re-cycling. Ensuring increased local supply of water through shared use water infrastructure can be part of the mitigation plan. UNFC can be part of an integrated management and monitoring tool.

C. Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

19. It is SDG7 that is most relevant for the work of the sustainable energy subprogramme as it is directly related to energy access, renewable energy and energy efficiency.

20. ECE's work on sustainable energy is designed to improve access to affordable and clean energy for all and help reduce greenhouse gas emissions and the carbon footprint of the energy sector in the region. It promotes international policy dialogue and cooperation among governments, energy industries and other stakeholders. As outlined above ECE's activities fall into three broad categories: reducing the ecological footprint of fossil fuels, enhancing interconnectivity, and preparing the future energy system. The current focus is on energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, natural gas, classification of energy and mineral reserves and resources, and energy security.

21. ECE's Committee on Sustainable Energy develops normative instruments, including its work on standards and best practice guidance. The details of the Committee's activities were set out above.

22. The Group of Experts on Energy Efficiency concentrates on: regulatory and policy dialogue addressing financial, technical and policy barriers to improve energy efficiency; and sharing experience and best practices in the field of energy efficiency in the UNECE region, including on strengthening institutional capacity in energy efficiency to reduce greenhouse gas emissions. The activities underway include the following:

(a) Exchange of know-how and best practices in selected economic sectors on how to significantly improve energy efficiency in the ECE region;

(b) Exchange of know-how and best practices on the role of standards and guidelines to significantly improve energy efficiency in the ECE region;

(c) Exchange of approaches and best practices for utilities and energy services companies to improve energy efficiency in the ECE region, including quality of service regulation;

(d) Regulatory and policy dialogue addressing barriers to improve energy efficiency;

(e) Facilitate engagement in the Global Energy Efficiency Accelerator Platform.

23. Group of Experts on Renewable Energy works to increase the uptake of renewable energy in the region and achieve the objective of access to energy for all in the ECE region. It does so through a) regulatory and policy dialogue and b) sharing of best practices on various renewable energy sources, including biomass, with a view to increasing the share of renewables in the global energy mix. The activities underway include the following:

(a) Tracking of the progress made in the uptake of renewable energy sources in the United Nations Economic Commission for Europe region;

(b) Exchange of know-how and best practices in the ECE region on how to help significantly increase the uptake of renewable energy;

(c) Integration of Renewable Energy in Future Sustainable Energy Systems in the region.

24. The Group of Experts on Renewable Energy cooperates with the Expert Group on Resource Classification (EGRC) to allow investments in renewable energy projects through the application of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 to renewable energy resources. The Group of Experts also cooperates with the Group of Experts on Gas to optimize the cooperation and synergy between renewable energy and natural gas. The nexus between renewable energy and water is also addressed by the Group of Experts through interdivisional cooperation with the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention).

25. Group of Experts on Cleaner Electricity Production from Fossil Fuels. The Group of Experts works to reduce greenhouse gas (GHG) emissions from electricity production from fossil fuels. The Group of Experts focuses on a) regulatory and policy dialogue; b) Sharing best practices on cleaner electricity production from fossil fuels in the ECE region; c) Carbon capture and storage (CCS), as well as carbon utilization; d) Enhanced oil recovery with CO2; e) Advanced fossil fuel technologies for power generation; and f) Evaluation of efficiency enhancing measures for coal-fired power plants including steam generators, air and flue gas systems, steam turbines, generators. The activities underway include the following:

(a) Assess a future role for thermal power plants in sustainable electricity systems;

(b) Increasing flexibility in coal power generation;

(c) Decreasing emissions and increasing efficiency from new and existing coal power generation using best practices across the UNECE region and globally;

(d) Assess means for development and deployment of carbon capture, use and storage (CCUS) technology and know-how.

26. Group of Experts on Coal Mine Methane (CMM) works to reduce greenhouse gas emissions from coal mines through recovery and use of methane. Activities underway include:

(a) Revise and update the Best Practice Guidance for Effective Methane Drainage and Recovery in Coal Mines;

(b) Disseminate the Best Practice Guidance for Effective Methane Drainage and Recovery in Coal Mines;

(c) Launch and support the work of the International Centre of Excellence on Coal Mine Methane;

(d) Collect and disseminate case studies on the application of best practice guidance in specific coal mines in different regions of the world;

(e) Expand the Group of Experts' scope of work to cover integrated methane management in the context of sustainable development;

(f) Continue to provide advice on coal mine methane related standards to the United Nations Framework Convention on Climate Change (UNFCCC), the International Organization for Standardization (ISO), and other international, national and regional market-based coal mine methane emission reduction mechanisms.

27. The Expert Group on Resource Classification works on the development, deployment, and maintenance of the United Nations Framework Classification for energy and mineral reserves and resources (UNFC) for effective management of national resource endowments and socio-economically efficient development of the energy resources needed for sustainable development. The Expert Group has been asked to:

(a) disseminate UNFC to all major stakeholders electronically;

(b) finalize the generic specifications to make UNFC operational;

(c) develop ideas on how the UNFC could apply to and integrate renewable energy;

(d) extend application of UNFC to nuclear fuels,;

(e) establish and maintain a Technical Advisory Subgroup to conduct on-going maintenance and periodic updates to UNFC in light of ongoing technological developments including in the field of carbon capture and storage,

(f) explore and develop other applications of UNFC, including to injection projects, in particular for storage of carbon dioxide,

(g) invite and facilitate development of case studies on a voluntary and extra-budgetary basis, using the developed specifications and guidelines if any, to assess the suitability of applying UNFC to individual deposits of fossil energy and mineral resources,

(h) encourage the development of education programmes on UNFC, using in particular the capabilities of industry professional societies, and

(i) develop further specifications and guidelines for UNFC recognizing that it is useful that they be tailored to meet, to the extent possible, the needs of applications pertaining to global energy and mineral studies, government resource management functions, corporate business processes and financial reporting standards.

28. ECE is helping countries improve management of their natural endowments through the United Nations Framework Classification and has recently published recommendations to policy makers on carbon capture and storage:

(a) UNFC is a unified management system for energy resources – coal, petroleum, renewables and uranium;

(b) UNFC can be potentially applied for management of renewable energy resources;

(c) UNFC provides a mechanism to measure losses and leakages in extractive industries. Natural gas flaring and mining and processing losses could be quantified in the framework;

(d) Injection projects are essential for cleaner fossil-fuel technology. UNFC specifications for injection projects are under development.

29. The Group of Experts on Gas provides a forum for multi-stakeholder dialogue on ways to promote the sustainable and clean production, distribution, and consumption of gas in the ECE region. The areas of work of the Group of Experts are policy dialogue and exchange of information and experiences among ECE member countries on gas-related issues of regional relevance, including the role of gas in the global energy mix, and the relation between natural gas and the environment. The Group of Experts is working on the sustainable and clean production, transport, and use of gas, including on issues that emerge from natural gas market studies carried out in the past, and methods of preventing gas losses and leakages during production and distribution. The Group of Experts has been asked to develop best practice guidance in methane management in the gas value chain, on the role of natural gas in significantly increasing the uptake of renewable energy in the ECE region and helping achieve the objective of access to energy for all in the ECE region, and on LNG. The Group of Experts has also been asked to explore how to remove barriers to the use of natural gas as a transportation fuel.

30. Upon request, ECE assists member States in developing national sustainable energy action plans and collaborates with member States to improve their national energy statistics programmes. ECE provides capacity building to member States in a range of action areas: Energy Market Reform, Energy Efficiency, Renewable Energy, Energy Access, Energy Security, Finance and Investment, Technology, and Energy Data, Indicators and Analysis. ECE encourages international dialogue for technological and knowledge exchange on lessons learned and best practices, and is working to develop internationally recognized minimum energy performance standards in all sectors. The latter includes developing appropriate indicators for attainment of SDGs.

D. Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

31. ECE's work on sustainable energy is designed to improve access to affordable and clean energy for all and help reduce greenhouse gas emissions and the carbon footprint of the energy sector in the region. It promotes international policy dialogue and cooperation among governments, energy industries and other stakeholders. ECE's activities fall into three broad categories: reducing the ecological footprint of fossil fuels, enhancing interconnectivity, and preparing the future energy system. The current focus is on energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, natural gas, classification of energy and mineral reserves and resources, and energy security.

32. The world is witnessing a transition to new business models and new ways of doing business. New technologies and innovation are critical in making this happen. No less critical are policies that stimulate these developments. A change in the way the energy markets work is inevitable and is already happening, but concerted efforts through right policies and incentives can and should speed up the process. Energy for sustainable development has to be looked at in a comprehensive and integrated manner that considers where current energy systems are today, where energy systems should be in the medium to

long term that satisfies both sustainability and climate change goals, and how we might get from today to this future. For this outlook to be realistic and practical we cannot discuss only increasing uptake of energy efficiency and share of renewable energy in the global energy mix, but must also engage an honest dialogue on the role of fossil fuels in the coming decades. Finding solutions for using fossils in the most effective way and with the minimal possible environmental and climate change impact is absolutely crucial if the world is to meet its sustainability and climate goals.

33. Building a sustainable global energy architecture that meets the needs of the SDGs will be decisive for tackling climate change and providing the necessary resilience. The future energy infrastructure requires a holistic view, a systems perspective that is looking forward to explore new ways of producing and consuming energy. It must be built on smart partnerships and alliances that help strengthen ongoing process and avoid duplication. This is the approach taken by the Committee on Sustainable Energy and its experts groups, in particular the Group of Experts on Renewable Energy, Gas, Resource Classification and Cleaner Electricity Production. Cross-cutting approaches and joint recommendations are key and are being developed with a view to inform national action plans and INDCs, e.g. smart integration of renewable energy into existing fossil based infrastructure, application of existing guidelines of resource classification to renewable energy, financing of more efficient coal fired power plants.

34. The Group of Experts on CMM considers the economic, environmental and social aspects of CMM management with a view to treating it in the context of sustainable development, industry restructuring, green economy and green job creation. For example, the Group of Experts on CMM is working to develop recommendations on the enabling role of CMM projects in restructuring coal mining industry through sustainable industrialization and innovative business models that facilitate transition from a single commodity producer to an integrated energy company.

35. The Group of Experts on Gas evaluates the changing infrastructure landscape for the gas sector including the development of LNG markets, the role of gas in supporting renewable deployment and impacts on gas power plants and infrastructure. Additionally, the task force on managing methane emissions is developing best practices to reduce such emissions and therefore improve the economic and environmental performance of the gas value chain. Lastly in the transport sector it is highlighting the barriers to greater deployment of natural gas vehicles and supporting infrastructure.

36. The Group of Experts on Cleaner Electric Power from Fossil Fuels is analyzing the role of coal power in sustainable energy systems through increased efficiency, deployment of CCS and flexible operation of coal based power plants. This analysis can help rationalize the deployment of coal power plants and other coal uses in sustainable energy systems.

E. Goal 10: Reduce inequality within and among countries

37. ECE's work on sustainable energy is designed to improve access to affordable and clean energy for all and help reduce greenhouse gas emissions and the carbon footprint of the energy sector in the region. It promotes international policy dialogue and cooperation among governments, energy industries and other stakeholders. ECE's activities fall into three broad categories: reducing the ecological footprint of fossil fuels, enhancing interconnectivity, and preparing the future energy system. The current focus is on energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, natural gas, classification of energy and mineral reserves and resources, and energy security.

38. The Hammamet Declaration called for economically rational policy-setting across a range of energy topics. Upon request, ECE assists member States in developing national sustainable energy action plans.

39. UNFC criteria include socio-economic factors that promote the continued viability of a project. These criteria include factors like gender equality and fruitful employment of dis-advantaged sections of the local population. Participatory decision mechanisms for social approvals are a major factor to be considered.

40. The Group of Experts on Cleaner Electricity Production from Fossil Fuels can help countries maintain access to a broader set of energy resources while still pursuing sustainability goals. Without such efforts countries may be forced to choose more expensive fuel sources throughout their development process and put them at a disadvantage to other countries with differing and cleaner energy sources such as hydro power.

F. Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

41. ECE's work related to energy access can be found in the Group of Experts on Renewables, in which promoting renewables in distributed structures is one approach to ensuring supply access, in the Group of Experts on Gas, in which work focused on enhancing the uptake of renewables also explores distributed generation applications and the use of gas in the transport sector which can significantly reduce air pollution, in the Group of Experts on Energy Efficiency, in which business models focus on delivering quality of life, and in the Expert Group on Resource Classification, in which governments are provided a tool with which to optimize management of their national endowments of energy resources.

42. ECE's work related to energy efficiency can be found in the Group of Experts on Energy Efficiency, in which the group is concentrating on: regulatory and policy dialogue addressing financial, technical and policy barriers to improve energy efficiency; and sharing experience and best practices in the field of energy efficiency in the ECE region, including on strengthening institutional capacity in energy efficiency to reduce greenhouse gas emissions. The activities underway include exchange of know-how and best practices on how to improve energy efficiency significantly; exchange of know-how and best practices on the role of standards and guidelines; exchange of approaches and best practices for utilities and energy services companies to improve energy efficiency, including quality of service regulation, and regulatory and policy dialogue addressing barriers to improve energy efficiency. Work on energy efficiency can also be found in the Group of Experts on Cleaner Electricity which is working to reduce the environmental footprint of fossil use.

43. Post-mining site remediation can be monitored through the UNFC framework. Some of the remediated sites are converted into green public spaces. Similarly, the Group of Experts on CMM covers the management of the so-called abandoned coalmine methane that, if not managed properly, still emit significant amounts of methane. Abandoned coal mines are found throughout ECE region, typically in densely-populated urban areas such as the Ruhr valley, central and Northeastern England, Belgium, Donbass, Kuzbass, or Silesia.

G. Goal 12: Ensure sustainable consumption and production patterns

44. ECE's work on sustainable energy is designed to improve access to affordable and clean energy for all and help reduce greenhouse gas emissions and the carbon footprint of the energy sector in the region. It promotes international policy dialogue and cooperation

among governments, energy industries and other stakeholders. ECE's activities fall into three broad categories: reducing the ecological footprint of fossil fuels, enhancing interconnectivity, and preparing the future energy system. The current focus is on energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, natural gas, classification of energy and mineral reserves and resources, and energy security.

45. The Hammamet declaration called for economically rational policy-setting across a range of energy topics. Upon request, ECE assists member States in developing national sustainable energy action plans.

46. UNFC is an international best practice for sustainable management of mineral resources, petroleum, uranium and renewable energy resources. It can be used for management of clean-energy projects like carbon-dioxide injection.

47. UNFC provides the tools for addressing the issues related to environmental impact and mitigation.

48. UNFC makes it easy to manage the efficiency of extractive industries. It is the only system that has specific provisions for quantification of unrecoverable material. Often it is the unrecoverable (and uneconomic) material and less efficient process that increase the waste burden. UNFC can classify and report quantities/volumes of natural resources under various levels of socio-economic, technological feasibility and geological understanding. This can be an effective tool to highlight project specific weakness in the manner natural resources are managed. Such problem projects could be subject to various mitigation studies.

49. UNFC can be made part of various sustainability reporting regimes. Sustainability reporting can thus be made more robust with linking it to ratios such as production / quantities remaining etc, which will provide a long-term or project life cycle view of individual extraction projects.

50. UNFC is a global communication tool, which has the unique distinction of being not language-dependent. UNFC reporting can be part of public communication protocols.

H. Goal 13: Take urgent action to combat climate change and its impacts

51. ECE's work on sustainable energy is designed to improve access to affordable and clean energy for all and help reduce greenhouse gas emissions and the carbon footprint of the energy sector in the region. It promotes international policy dialogue and cooperation among governments, energy industries and other stakeholders. UNECE's activities fall into three broad categories: reducing the ecological footprint of fossil fuels, enhancing interconnectivity, and preparing the future energy system. The current focus is on energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, natural gas, classification of energy and mineral reserves and resources, and energy security.

52. The relationship between SDG13 and the other development goals, including SDG7, result in tensions that are most important for the sustainable energy subprogramme. The tensions make a nexus approach to policy-setting a true imperative. While the political support for 2030 Agenda and the Paris Agreement on climate change is unprecedented, news about climate change is making headlines: 2016 is set to be the warmest year ever recorded. It will be the second year in a row to break global temperature records. Many scientific voices are advocating that taking factors like ocean warming and melting permafrost in account the 1.5-degree level has already been reached.

53. The sustainable energy subprogramme is examing the relationship between the two SDGs from an energy angle: Is energy the culprit or the solution to achieving the SDGs and climate change goals? It is particularly the work about the quality of and access to energy services in many countries, the costs of energy services, and reducing the carbon footprint of the energy sector that aims to contribute to countries's efforts to achieve their climate goals.

54. The sustainable energy subproamme has partnered with other UNECE division to tackle the challenge of the nexus in particular on energy, climate, food, water and health.

I. Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development

55. Providing best practices and normative standards through inclusive, transparent and participative processes are at the heart of the work of the UNECE sustainable energy division. All the Groups of Experts enable knowledge sharing, capacity building and knowledge creation that is essential for countries to develop in a sustainable manner, using best in class approaches, rather than dated ones. UNFC is developed with partnership of international organizations, industry bodies and professional associations. UNFC application for management of various natural resources with sustainability in focus is more effective with regional and international cooperation, and training and recognition of competent persons can be part of UNECE activities on UNFC.

56. UNFC is developed and maintained by the Expert Group on Resources Classification (EGRC), which is an open platform for all stakeholders – Government officials, International Organizations, Financial Institutions, Industry, Academia and Civil Society Organizations. UNFC is becoming part of national regulation in many countries

57. Implementation of SDGs requires performance indicators and base-line data to monitor progress. High-quality data on natural resources can be beneficial for judging progress of the SDGs. UNFC can be the framework for providing data on natural resources.

V. Indirect support of Sustainable Development Goals

58. This section presents the work undertaken by the sustainable energy subprogramme that are related indirectly to a number of other SDGs not indicated in the previous section.

J. Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

59. Work on the water-food-energy-ecosystems nexus promotes increased efficiency of resource use. Assessments of the water-food-energy-ecosystems nexus will make it possible to develop concrete, cooperative solutions to increase water productivity, including in agriculture, and to maintain ecosystems. ECE's Sustainable Energy Division collaborates with the Environment Division on specific water-food-energy-ecosystems activities.

60. Energy access is important for ending poverty, achieving food security and improved nutrition and promoting sustainable agriculture to the extent that it relates to the availability of energy to sow, water, tend, and reap crops; to deliver supplies and food; to refrigerate; and to prepare food for consumption.

61. ECE's work related to access can be found in the Group of Experts on Renewables (in which promoting renewables in distributed structures is one approach to ensuring supply

access), in the Group of Experts on Gas (in which work on enhancing the uptake of renewables also explores distributed generation applications and work on LNG considers the role of small scale LNG to provide access to modern energy services without costly, large scale infrastructure), in the Group of Experts on Energy Efficiency (in which business models focus on delivering quality of life), and in the Expert Group on Resource Classification (in which governments are provided a tool with which to optimize management of their national endowments of energy resources, with positive implications for local economies, employment, royalties, and tax revenues).

62. Minerals of phosphorus, potassium, as well as other minerals like calcium, sulfur, magnesium, boron, chlorine, manganese, iron, zinc, copper, molybdenum and nickel are essential primary, secondary and micro nutrients required to increase agricultural productivity and maintain soil quality. Nitrogen as ammonium nitrate is major product of the oil and gas industry. UNFC provides a tool for managing these resources in a sustainable manner. Mining effluents can be treated and converted into liquid fertilizers and excess water from mining/oil extraction can be used for local agriculture.

K. Goal 3: Ensure healthy lives and promote well-being for all at all ages

63. The provision of lighting, heating, cooling, mobility and transportation, cooking, equipment operations, and all other energy services are essential for the provision of quality health care systems. Health concerns also arise from arise in the trade-offs between reliance on traditional renewable energy (firewood, dung) and fossil fuel-based modern energy services. In such cases, being renewable is not necessarily the healthiest and or least costly option in the context of sustainable development, and work is underway to replace traditional biomass with modern renewable approaches that meet health objectives. Similarly, protection against mosquito-borne illnesses can be provided by staying indoors in air-conditioned spaces, and protection against water-borne infectious diseases can be provided by filtering or more elaborate water treatment systems that depend on pumps. Even in the area of road traffic accidents, the provision of proper lighting and traffic control systems are important features.

64. All of these areas involve providing access to energy. ECE's work related to access can be found in the Group of Experts on Renewables, in which promoting renewables in distributed structures is one approach to ensuring supply access, in the Group of Experts on Gas, in which work focused on enhancing the uptake of renewables also explore distributed generation applications, in the Group of Experts on Energy Efficiency, in which business models focus on delivering quality of life, and in the Expert Group on Resource Classification, in which governments are provided a tool with which to optimize management of their national endowments of energy resources and which includes assessment of the safety of people and workers.

L. Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

65. Access to energy supports the education goal to the extent that there is a need for lighting for children to do homework, transportation to get children to school, and, as appropriate, electricity to power computers.

66. ECE's work related to access can be found in the Group of Experts on Renewables (in which promoting renewables in distributed structures is one approach to ensuring supply access), in the Group of Experts on Gas (in which work on enhancing the uptake of renewables also explores distributed generation applications and work on LNG considers the role of small scale LNG to provide access to modern energy services without costly,

large scale infrastructure), in the Group of Experts on Energy Efficiency (in which business models focus on delivering quality of life), and in the Expert Group on Resource Classification (in which governments are provided a tool with which to optimize management of their national endowments of energy resources, with positive implications for local economies, employment, royalties, and tax revenues).

67. Sustainable management of resources using UNFC includes corporate social responsibility activities that can promote education and training in local communities. These activities lead to social acceptability and continued viability of extraction projects.

M. Goal 5: Achieve gender equality and empower all women and girls

68. ECE continuously strives to promote gender balance in all its activities, not only in the overall representation but also in the identification of speakers, as well as in its capacity-development activities.

69. ECE conducted a Symposium on Empowering Women in the Energy Sector. The symposium set the stage for addressing challenges in the energy sector at the societal, governmental, organisational, unit, and individual levels.

70. Mining and other extractive industries historically have had a culture of excluding women, but this culture is being changed progressively worldwide. UNFC can be a management tool for project-level monitoring of progress in promoting gender equality.

71. UNFC is a communication tool and a management tool for decision making. The social acceptability of projects requires community consultations that can include criteria for empowerment of women.

N. Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

72. ECE's work on sustainable energy is designed to improve access to affordable and clean energy for all and help reduce greenhouse gas emissions and the carbon footprint of the energy sector in the region. It promotes international policy dialogue and cooperation among governments, energy industries and other stakeholders. ECE's activities fall into three broad categories: reducing the ecological footprint of fossil fuels, enhancing interconnectivity, and preparing the future energy system. All these activities may be instrumental in creating more decent, inclusive and green jobs associated with the future energy system. The current focus is on energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, natural gas, classification of energy and mineral reserves and resources, and energy security.

73. Comprehensive extraction possibilities and value-addition possibilities can be quantified and addressed through UNFC. Environmental impact and management plans are addressed in UNFC throughout a project's life-cycle and addressed detailed studies required to manage extraction projects. Safety and security are considered in detailed studies required under UNFC.

O. Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

74. Near shore and deep sea mining, oil & gas extraction, and off-shore wind energy will be increasing in near future. UNFC provides a framework to understand and quantify resources and the environmental impacts of energy projects.

P. Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

75. Environmental Impact Analysis and Management Plans are part of the specifications and guidelines in UNFC.

Q. Goal 16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

76. UNFC is a global communication tool that is well-suited for decision-making at all levels. Base-line data provided under UNFC can promote transparency in extractive industries. UNFC can be adopted as the internal management system for all institutions engaged in development of mineral resources, petroleum and renewable energy.

VI. Concluding remarks

77. Energy is described as the golden thread running through all of the sustainable development goals. UNECE's sustainable energy sub-programme is structured to support member States in their efforts to achieve sustainable development and the Paris climate agreement.

78. The subprogramme is most relevant to Goal 7, moderately relevant to goals 1, 6, 9, 10, 11, 12, 13, and 17, and tangentially relevant to goals 2, 3, 4, 5, 8, 14, 15, and 16. The subprogramme will provide practical support to the implementation of 2030 Agenda by, among others:

(a) Assisting member States in the development of sustainable energy action plans;

(b) Supporting monitoring and review of progress towards the energy-related SDGs;

(c) Breaking down silos within Governments and within ECE in addressing energy issues;

(d) Building partnerships outside ECE, other international organizations, NGOs, academia and the private sector; and

(e) Developing capacity and sharing experiences and lesson learned.

79. The Sustainable Energy subprogramme thus offers mechanisms and tools to help ECE member States to achieve the SDGs.