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Committee on Sustainable Energy

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Strategic review of the sustainable energy subprogramme

Strategic review of the United Nations Economic Commission for Europe sustainable energy subprogramme

Note by the subsidiary bodies

I. Executive summary

1. The work of the United Nations Economic Commission for Europe (ECE) 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. ECE is working to reconcile the reality of fossil fuels' enduring share of the energy mix with the need to address climate change, enhance integration of the region's energy markets, and facilitate the transition to a sustainable energy system.

2. The ECE region is falling short of its member States' commitments and objectives on sustainable energy. In terms of deciding on specific courses of action to pursue, the Committee considers that the work and its outcomes must reflect United Nations' scale, scope, role, and values in terms of: impact, political relevance, visibility; power to inspire; reputation impact; attractiveness for resourcing; resource efficiency, nexus contributions, and gender benefits.

3. The work of the Committee on Sustainable Energy (Committee) and its six expert groups (the subsidiary bodies) fall into three broad areas: Deep Transformation of the Energy System; Reducing the Environmental Footprint of Energy; and Mobilizing Action on energy for sustainable development.

4. The current strategic priorities for the sub-programme include Sustainable resource Management, Methane management; Carbon neutrality; Accelerating the uptake of renewable energy; Developing investment guidelines for fossil energy; High performance buildings; and Helping member States explore efficient pathways to a sustainable energy future. Activities recommended for the future, pending available resources, include: Measuring and monitoring Sustainable Development Goals (SDGs); Just transition; Investment guidelines for nuclear power; Global agreements on carbon costs and organisation of carbon markets; Energy market/power market design; Removing barriers to energy trade; Digitalisation; Energy System Resilience; and Assuring energy security.

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5. This document sets forth ECE's strategic approach on energy to helping its member States meet their commitments to the 2030 Agenda and the Paris Climate Agreement and to addressing the region's challenges and objectives with products and activities that deliver measurable, concrete results in the near term with enduring impact. The document was prepared jointly by the Chairs of the six expert groups and the Bureau of the Committee and is presented to the Committee for approval.

II. Introduction

A. Mandate for the work on sustainable energy

6. 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. The 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.

7. The 2030 Agenda on Sustainable Development (2030 Agenda) provides an ambitious and comprehensive framework that opens new perspectives for policymaking and international cooperation. The challenges facing the ECE region cut across most sustainable development goals and cannot be tackled effectively through an exclusively sectoral focus. ECE has identified four key nexus areas for collaboration among its substantive divisions across the organisation: 1) sustainable use of natural resources; 2) sustainable and smart cities for all ages; 3) sustainable mobility and smart connectivity; and 4) measuring and monitoring SDGs. ECE's energy sub-programme contributes directly in each of the four nexus areas.

8. Under its current programme, ECE develops normative instruments, including work on standards and best practice guidance in energy efficiency, renewable energy, natural gas and methane. ECE is helping countries improve management of their natural endowments through the United Nations Framework Classification (UNFC), an internationally applicable scheme for classifying and reporting energy and mineral reserves and resources and has recently published recommendations to policy makers on carbon capture and storage.

9. In the longer term and to affirm its value added, ECE will need to continue and expand 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. The transition to a new, sustainable, and reliable energy system can be accelerated if member States implement in a concrete fashion the measures called for in the Hammamet Declaration[1]. The programme of the ECE's Committee on Sustainable Energy aims to:

(a) improve energy efficiency from source to use;

(b) measure and correct energy market failures;

(c) facilitate economic integration and cooperation and promote sustainable development;

(d) reduce energy and carbon intensities;

(e) minimize the impact of the energy sector on the environment from source to use;

(f) ensure that energy production, conversion and use is cost competitive;

(g) enhance cost-effective attainment of environmental goals through technology, including cost effective renewable energy and carbon capture and storage, raised full cost awareness, and increased capacity;

[1] https://www.unece.org/fileadmin/DAM/press/pr2014/Energy_Joint_Statement_Fifth_International_Forum.pdf

(h) innovate constructively across the board in the organization of society, industry, and government; and

(i) facilitate exchange of experience and expertise through dialogue and networking among the United Nations Member States, industry, non-governmental and intergovernmental organisations, academia, and the general public on energy matters.

10. The Committee and its six subsidiary bodies are expected to carry out concrete and results-oriented activities with the aim to achieve the specific objectives identified for each priority area.

11. The Committee and its community of experts must innovate and anticipate the needs of the member States so that as progressively more carbon constrained economies develop the ECE is perceived by its constituents as important and reliable institution that is a repository of knowledge and talent that can lend a hand or provide a solution to difficult problems. We can achieve this position as thought leaders by developing the overarching vision and goals and sets of specific tactics for each group of experts. Once there is a programmatic context, the groups of experts can develop their work plans in a coordinated and connected manner to support and enhance member States' skill sets that will be needed to meet the challenges of energy-related problems as they evolve. Our work connects outside the ECE region as our region has experience that can be leveraged in different settings to progress and advance the pace of adoption of the SDGs.

12. Training, engineering analysis, construction and operation will be required, and the United Nations can use its convening power to facilitate common, rational approaches. The actual actors for attaining outcomes are Governments in setting their national frameworks, industry in deploying their capabilities on business models allowed under the frameworks, and capital markets that will finance the transformation. All should look to the United Nations for setting the target and the vision. When it comes to international framework conditions, United Nations is the doer. The strategy of ECE's energy sub-programme must begin there and layer on the facilitating activities to secure competence and facilitate implementation.

B. State of play: Our region is falling short and there are barriers to change

13. The objective of ECE's sustainable energy sub-programme is to make concrete, measurable progress towards the 2030 Agenda and the Paris Climate Agreement.

14. The ECE region is falling short of its member States' commitments and objectives on sustainable energy. In order to ensure that energy makes an optimal, enduring contribution to countries' economies and their peoples' quality of life, including climate change, the starting point is recognition that:

(a) energy services are critical inputs to all economic sectors as they enable food production and distribution, access to clean water, development of raw and refined materials, mobility, communications, sanitation, health care, heating and cooling, refrigeration, lighting, education, and so forth;

(b) the current energy system falls short because it does not deliver, in aggregate, on access, affordability, efficiency and productivity, quality of service, security and resilience, and environmental performance, including greenhouse gas (GHG) emissions;

(c) transformation of the energy system to one that delivers energy services that support the 2030 Agenda faces important barriers:

(d) the existing energy system represents significant investment in and commitment to physical infrastructure and interconnected supply chains;

(e) industrial/urban complexes in many areas are associated with primary energy production – for example power generation, steel production, vehicle manufacturing, and the like – and any shifts away from the primary energy

sources will have consequences for jobs and the social fabric of communities beyond the fuel source;

(f) investment and operational decisions on resource development, transformation, and consumption are driven by economics determined by supply and demand for products and services with monetary value, to the detriment of resources without explicit monetary value; and

(g) the political and regulatory infrastructure underpinning energy will be unable to respond to the imperatives of the 2030 Agenda unless and until there is alignment among constituent stakeholder interests, including a willingness to consider all policy and technology options in an agnostic, pragmatic manner.

15. The desired end point is an energy system that properly supports environmental, economic, and social objectives in an integrated way – deep transformation of the energy system is an imperative despite the barriers listed above.

C. The energy context of the ECE region

16. The ECE region is diverse and encompasses countries that are high-income and low-income, energy rich and energy poor, and countries that are in economic transition. It produces and consumes 40% of primary energy and produces 40% of global economic output. 80% of primary energy in the ECE region, as with global primary energy, is fossil, and the ECE region accounts for half of global GHG emissions. Even if the region succeeds in contributing to efforts to limit global warming to 2ºC by 2050, fossil fuels will still represent 56% of the region's energy mix in 2050. The region remains dominant in the global financial system and is home to important energy industries.

17. The global coronavirus pandemic has brought economic activity around the world to a nearly full stop. It remains unclear how long the health, social, and economic repercussions of the pandemic will last nor how deep they will go. The consequences for the energy system in terms of pricing, operations, inventories and links among connected supply chains have been significant, as demand has plunged across the spectrum of energy services. As the slowdown endures it will deter longer-term investment. Experts have warned that global pandemics such as the current health crisis will become more frequent as the climate changes. Anticipating such an outcome requires systemic preparation and investment in resilience, including in the energy system.

18. The global economic slowdown appears to be benefitting the environment. ECE has previously noted that the world's doomsday clock for climate change stood at 10 past midnight – until recently trends pointed to an increase in global average temperatures of between 4 and 6^0C, a far cry from the target of 2^0C or the even tighter 1.5^0C ambition. Will we simply revert to business as usual once this crisis has passed or can we take advantage of the reprieve granted by this crisis to drive a pivot to a sustainable economic and energy model?

19. Other "megatrends" will affect the energy system and should inform the ECE energy subprogramme. These megatrends, including topics such as increasing digitalization of energy systems and societies, emerging conflicts in international trade, accelerated technology innovation and progress, should be considered on an ongoing basis as part of ECE's continuing strategic reflections.

III. The ECE sustainable energy subprogramme

20. ECE has unique value propositions within the UN family and on the international energy scene given the role that fossil energy plays in the region, the specific make-up of its membership, and ECE's institutional capabilities for developing normative instruments. The ECE energy sub-programme's expert communities have enormous substantive and innovative capability across the range of energy topics, and the subprogramme can mobilise countries, the private sector, organisations, civil society, and academia to work toward meaningful outcomes.

21. It will be important for the Committee to obtain alignment among member States on its vision for the future and the pathway to the agreed destination. The United Nations works on a consensus basis, but there is not a consensus on objectives and approaches to the energy sector and its contributions. In particular, the groups of experts will consider, individually and collectively, the relevant SDG targets, 169 in total, and how to advance the targets from the energy side with a focus on impactful outcomes. The expectation is that the Committee and its expert communities will spur and prod member States to find and pursue pathways to meet their commitments. Activities are intended to help countries understand what is possible and to prepare for the world of 2030 (and on to 2050).

22. In terms of deciding on specific courses of action to pursue, the Committee considers that the work and its outcomes must reflect the scale, scope, role, and values of the United Nations:

(a) Impact, scale, and enduring effect;

(b) Political relevance and viability;

(c) Ease of communication and visibility;

(d) Power to inspire, convene, stimulate and train;

(e) Reputational impact;

(f) Attractiveness for resourcing, including extra-budgetary financing, in-kind contributions, and engagement of experts;

(g) Alignment with ECE's purpose and with the activities of the United Nations family of organisations and other international organisations;

(h) Focus on required instruments/tools/actions that only the United Nations can produce;

(i) Near-term effect/degree of completion by 2022; and

(j) Resource efficiency, nexus contributions, and gender benefits.

23. The objective of ECE's sustainable energy sub-programme is to help member States ensure that energy makes an optimal, enduring contribution to countries' economies, their peoples' quality of life, and responsible environmental stewardship, including climate change. The sub-programme is conceived to help member States make concrete, measurable progress on energy:

(a) Transform energy in support of the 2030 Agenda;

(b) Ensure a just transition;

(c) Address the nexus challenges of the 2030 Agenda (water, food, cities, resources, etc.);

(d) Ensure access to affordable, quality energy services;

(e) Improve energy productivity and energy efficiency;

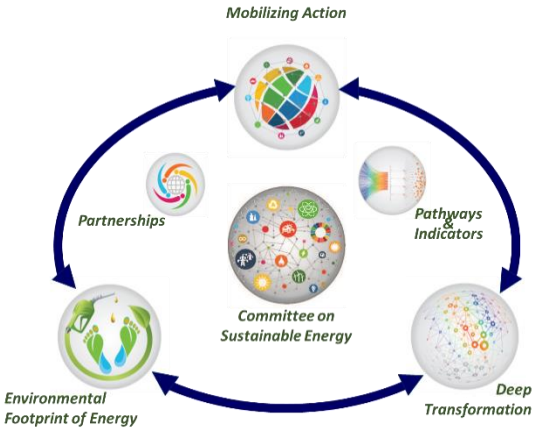
(f) Achieve carbon neutrality (and more, since inertia in emissions from the existing system will overshoot conditions for 2ºC); and

(g) Tracking progress toward the objectives and taking corrective action as needed.

A. Areas of work of the Committee and its expert groups

24. The work of the Committee and its expert groups falls into three broad areas: Deep Transformation of the Energy System; Reducing the Environmental Footprint of Energy; and Mobilizing Action on energy for sustainable development (see Figure I).

Figure I
Areas of work of the Committee



25. Deep transformation of the energy system involves:

(a) reconceiving energy as a service to improve energy productivity, ensure affordable access, unleash innovation, and introduce new players;

(b) rationalising energy production and consumption subsidies that impede attainment of sustainable energy objectives (including fossil fuel subsidies, end-user tariffs, feed-in tariffs or other production subsidies, and the like);

(c) improving energy markets with smart technology and improved market design to enable seamless interaction among consumers and new energy service providers including distributed generators;

(d) creating a conducive but rational policy and programmatic ecosystem to enable accelerated penetration of low carbon energy sources;

(e) deploying ECE's sustainable resource management products to support countries' holistic management of resource endowments including critical raw materials for batteries and renewables.

26. Reducing the environmental footprint of energy involves:

(a) reducing the net carbon intensity of the current energy system;

(b) using existing energy infrastructure to enhance uptake of low- or no-carbon technology, including renewable energy (electricity and gases), and to foster an economy using electricity, hydrogen and other low carbon gases;

(c) helping countries limit methane and CO_2 emissions;

(d) activating ECE's recommendations on high efficiency, low emission (HELE) coal-fired power plants, carbon capture and storage/carbon capture utilization and storage (CCS/CCUS), coal mine methane (CMM), and abandoned mine methane (AMM)2;

(e) removing atmospheric CO_2 with, for example, bioenergy with CCS or direct air capture technology.

[2] HELE refers to High Efficiency Low Emission electricity generation that lowers the carbon footprint of power generation by using less fuel more efficiently, CCUS is an acronym for Carbon Capture Use and Storage which are processes that removes carbon dioxide from industrial process, primarily power generation, and uses the captured gas and stores it in geologic reservoirs afterwards, CMM is Coal Mine Methane and AMM is Abandoned Mine Methane, both of which refer to methane which is liberated during coal extraction or that which is emitted following mine closure.

27. Mobilising action on energy for sustainable development involves:

(a) using industry's capital, technology, and competences to drive global transformation;

(b) engaging with agents of change to deliver workable solutions and concrete outcomes: local actors who effect real change; local, grass-roots communities who create political will; disruptive new players/innovators and existing infrastructure managers/owners;

(c) instituting local community structures (see Annex 1) for effective deployment of ECE products that take many forms ranging from guidance that showcase best practices, normative documents which present standards for improved operation of systems which provide essential services and products, trade accords, and meetings that offer the forum for diversity of thought and approaches that improve quality of life and decarbonize energy systems (specific examples include UNFC, the Best Practice Guidance on Coal Mine Methane, and the Framework Guidelines for Energy Efficiency Standards in Buildings);

(d) collaborating among the five United Nations regional commissions to engage the world's energy community to deliver concrete outcomes;

(e) coordinating across the United Nations family on activities, perspectives, and results; and

(f) assisting member States in exploring their strategic options and implementing concrete programmes for achieving energy for sustainable development with pragmatic, enduring, and effective solutions.

B. Strategy of the ECE sustainable energy subprogramme

Current strategic priorities cover:

1. Sustainable resource management

28. Resource production, transformation and use, if properly managed, can ensure beneficial social and environmental outcomes. ECE is extending UNFC to a full-fledged management system for resources (UNRMS). The objective is to develop, disseminate and deploy UNFC and UNRMS fully involving experts from all member States. ECE is embarked on establishment of international centres of excellence for sustainable resource management (ICE-SRM). The centres will fund expanded outreach and training activities. In addition, the secretariat is seeking donations to support sustainable resource management as a fully extrabudgetary-funded (XB-funded) activity.

2. Methane management in extractive industries

29. Reducing methane emissions offers significant climate change benefits, especially in the near term, as there is a large economic reduction potential and cost-effective mitigation technologies often are readily available. ECE's work on methane involves developing best practice guidelines to address monitoring and mitigating methane emissions in the oil, gas, and coal sectors. The Group of Experts on Coal Mine Methane has developed best practice guidance for both coal mine methane and abandoned mine methane and, with partners, has established international centres of excellence on coal mine methane (ICE-CMM). The focus of the Group is on technical aspects and best practices for managing methane in coal mines, thereby reducing accumulations of methane in coal mines and as a consequence improving the safety of coal mines. The Group of Experts on Gas, in close cooperation with the Global Methane Initiative (GMI), has been deeply involved in the development of best practices guide for effective development of and implementing effective practices for monitoring, reporting and verifying (MRV) methane emissions from the oil and gas sector, as well as proposing mitigation measures (also a set of case studies were developed and published) to be easily adopted in the short term. The work on best practices for the oil and gas sector to

date is a compendium of practices currently deployed. Full-fledged, technical level best practice guidance from the UN for the oil and gas sector would be an appropriate next step. The secretariat is working with member States and partner organisations to mobilize a General Assembly declaration of an *International Decade for Methane Management* with an XB-funded programme designed to reduce atmospheric methane concentrations by eliminating or avoiding anthropogenic sources. The work could involve negotiation of a convention.

3. Carbon neutrality

30. Work in this area is designed to help member States move to carbon neutrality in the ECE region in the energy sector by 2050. Achieving carbon neutrality will require an "all technology" strategy involving accelerated deployment of energy efficiency, renewable energy, CCS/CCUS, HELE technology, low-carbon gases (including not only natural gas but decarbonized gases, renewable gases, and hydrogen), nuclear power, and CO_2 removal or other approaches such as increasing forests' absorptive capacity. The Group of Experts on Cleaner Electricity Systems is overseeing the project on carbon neutrality, and funding is in place for both a broad-based analysis and deep dive appraisals of possible contributions from CCS/CCUS and nuclear power. The secretariat is seeking additional funding for deep dives on hydrogen, energy efficiency, renewable energy and on other topics such as alternative business models.

4. Renewable energy

31. Work on renewables involves tracking progress in the uptake of renewable energy in the region; exchanging experience and good practices on increasing the uptake of renewable energy; and cross-cutting cooperation, for example with natural gas infrastructure, to strengthen and accelerate the integration of renewable energy (electricity and gases). Work also is underway to develop guidelines for classification of renewable energy resources under the auspices of the Expert Group on Resource Management. The focus to date has been on Hard Talks that derive from the XB-funded regular report on the status of renewable energy in 17 member States. Topics related to roof-top solar installation and development of hydroelectric resources are relevant for the future work of the Group of Experts on Renewable Energy.

5. Gas/es

32. As a concrete example of cross-cutting cooperation, the Group of Experts on Gas and the Group of Experts on Renewable Energy work to accelerate deployment of variable renewable electricity (VRE) generation by using gas infrastructure as the backbone of flexibility needed in a low-carbon energy system. The progress of higher penetration of VRE into ECE energy systems of ECE' members brings new challenges on the management of the cost-efficiently, to face the strong fluctuations and intermittency and for of ensuring a reliable and robust energy system at all times. The decarbonisation through synergies between renewable electricity and gas has two components. The first focuses in the short term on the use of flexible, cost-competitive and agile natural gas -fired generation as enabler of VRE integration. The second deals with not only renewable electricity, but also on gases. It is based on the hybrid energy system concept which envisages the use of gases (natural gas, low-carbon, decarbonised and renewable gases), together with the sectoral integration concept, as pillars to advance in VRE penetration while significantly reducing greenhouse gas emissions is reached.

6. Investment guidelines for fossil energy

33. Many countries remain committed to using coal. As noted, even under a scenario that meets the 2ºC objective, in 2050 fossil fuels still will represent 56% of the primary energy mix, and coal will be 7%. Experts are working to develop investment guidelines for new fossil infrastructure to minimize if not eliminate or offset entirely the GHG emissions associated with fossil fuel use.

7. High performance buildings

34. Buildings consume over 70% of the electric power generated and 40% of primary energy and are responsible for 40% of CO_2 emissions as a consequence of the energy services they require. Buildings embody significant CO_2 emissions in the products used to construct them yet could serve as carbon storage with use of wood products. ECE's High Performance Buildings Initiative (HPBI) aims to move the dial on building energy performance, GHG emissions and indoor air quality; improve the global supply chain for the construction business; and accelerate the uptake of high-performance best practices. The HPBI involves extending the network of centres of excellence, raising funding for a range of dissemination, training, and deployment activities, and recruiting academics into the research leg of the initiative. Major funding initiatives are under consideration by donors in 2020.

8. Pathways to sustainable energy

35. The ongoing Pathways programme has been conceived to respond to issues that emerged from Phase 1 of the project: closer appraisal of input assumptions, and closer consideration of both regional specificities and alternative policy approaches. A concept for a deep dive on Central Asia has been developed. It proposes an assessment of specific opportunities and challenges in Central Asia (including reflection on relevant alternative technologies and policy approaches), testing strategic options using the outcomes of the regional assessment, and dialogue and dissemination. There would be as well capacity building to assist member States in using the analytical architecture developed in Phase 1 and further development of an early warning instrument to permit energy experts to test adaptive responses using the developed modelling capability. The project is still under consideration but has not been funded. If the range of regional deep dives is conducted then the stage will be set for broader high-level political dialogue among ECE member States.

C. Future strategic orientations

36. Decisions regarding future activities impose several considerations:

(a) **Outreach.** There is a critical need for the sub-programme to reach out to member States and donors, to extend the engagement of energy experts, and to involve the full spectrum of stakeholders in the work of the Committee [use of social media platforms and virtual communications is encouraged];

(b) **Dialogue.** Extended and closer dialogue with member States is necessary to explore what they want and need and what the energy sub-programme can deliver in pragmatic terms;

(c) **Political relevance**. Important measures of success are measurable, concrete results that are politically relevant;

(d) **Tools.** The program must provide tools for MS to attain SDG7 with constraints of budgets, finance, and time;

(e) **Results.** The groups of experts need to deliver cross-cutting results.

37. The following topics are recommended for inclusion in the activities of the Committee:

(a) Measuring and monitoring SDGs: closer involvement of the energy-sub-programme in the statistical work of ECE and the custodian agencies of the Global Tracking Framework;

(b) Just transition;

(c) Investment guidelines for fossil/nuclear;

(d) Global agreements on carbon costs and organisation of carbon markets;

(e) Energy market/power market design, including grid and interconnections management;

(f) Mapping and removing barriers to international energy trade/interdependence and international transport of wastes (CO_2 in particular);

(g) Digitalisation;

(h) Assessment of risks and vulnerabilities; energy system resilience;

(i) Assuring energy security (equitable regional trading and interdependence vs. energy independence).

38. The sequence to follow is the development of normative instruments that are appropriate and necessary for the United Nations. Once those instruments are in place, whether best practice guidance, standards, regulations, or conventions, it is then necessary for the organisation of capacity building, dissemination, training, and deployment.

Annex

International Centres of Excellence ECE Best Practices

I. Introduction

1. The objective of this annex is to describe the ECE energy subprogramme's various centres of excellence to describe their purpose and oversight to strengthen the model and approach while leaving flexibility to meet specific requirements.

2. A generic definition of a centre of excellence is *a team, a shared facility or an entity that provides leadership, best practices, research, support and/or training for a focus area*. The following types of centres have been developed under the auspices of the energy sub-programme:

3. **International Centres of Excellence on High Performance Buildings (ICE-HPB)** work to: disseminate the ECE Framework Guidelines for Energy Efficiency Standards in Buildings; engage dialogue among industry leaders to identify challenges, share best practices and build a growing and diverse community of practice; gather and disseminate knowledge, including education/training, exhibits, case studies, research, demonstrations, and the production of industry focused print and on-line resources; catalyse design and construction industry tools and training development, and identify potential barriers to adoption and implementation; and foster public demand and support for best practices through recognition and awards, open houses and tours, public events, and demonstrations.

4**. International Centres of Excellence on Coal Mine Methane (ICE-CMM)** work to: disseminate ECE's best practice guidance on Coal Mine Methane; train local mining companies and institutions on the techniques, technology, and policy framework to manage methane accumulations in mines; develop case studies and experience addressing methane issues in different mining conditions; and engage with local and national authorities on the merits of deploying proper management techniques.

5. **The International Centres of Excellence on Sustainable Resource Management (ICE-SRM)** build national and regional capacities in countries to apply UNFC and UNRMS to all resources to enhance investment in the resource sector and to accelerate countries' attainment of the 2030 Agenda. The principal activities of ICE-SRM designed to achieve these objectives include multi-stakeholder workshops connecting key institutions in countries to extend the principles of UNFC and UNRMS, high-level consultations with investment banks, development banks and other financial institutions such as stock exchanges and the International Accounting Standards Board (IASB), development of documentation, UNFC- and UNRMS-based reporting codes and application guidelines, coordination with key institutions for deploying the resource management mechanism, training courses for Competent Persons, including a formal designation procedure, preparing case studies and application scenarios, and branding, international outreach and communications.

II. Best practices for International Centres of Excellence in ECE

6. The following questions guide consideration of best practices for international centres of excellence in a UNECE context:

(a) Is there clear **formulation of deliverables** (action plans that are reviewed and updated periodically)?

(b) What sort of **accountability and oversight mechanisms** ensure that partners deliver on the partnership agreement and adhere to agreed conduct?

(c) Is there **periodic reporting** that demonstrates **measurable impact** of the partnership and benefits for our membership?

(d) What sort of **regular reviews** ensure that the partnership remains relevant and fully aligned to organizational priorities.

(e) Are there templates to guide the formulation of future agreements and ensure a common approach, including criteria for the selection of partners.

III. Sustainable Energy Division

7. The centres of excellence supported by the Division (CMM, HPB, and SRM) are designed to deploy and disseminate a product of ECE that has been endorsed by the intergovernmental process and body (the Committee) and that the subprogramme is mandated to disseminate: Best Practice Guidance on Coal Mine Methane, Framework Guidelines for Energy Efficiency Standards in Buildings, and UNFC/UNRMS.

8. The centres have established criteria for who can become a centre and terms of reference for what they are expected to deliver in concrete terms. These centres of excellence are expected to be an essential mechanism to mobilize XB resources. One of the key requirements is that they report what they have achieved in the previous period, what they plan for the coming period, and their sources and uses of funds for United Nations-related activities. Ultra-transparency is the intention. The centres are responsible for resourcing their own activities. The funding model is still under development, but the intent is for the centres to fund coordination activities at ECE.

9. Each type of centre (CMM, HBP, or SRM) has a standard, vetted memorandum of understanding (MOU) template for the centres in each area. This is a critical point as concerns have been expressed that one-off MOUs that establish centres may open the way for terms and conditions that are not directly related to deployment and dissemination. Having standard templates for the centres' MOUs ensures that they are not all *ad hoc*, which also is resource efficient. There is room to reflect certain local circumstances, of course, but the intent is to avoid reinventing the wheel each time. Having a standard template also facilitates the discussions with partners.

10. For each type of centre, criteria have been agreed regarding can become a centre. Qualifying criteria are considered vital to ensure the sustained credibility of the network.

11. Terms of reference have been established for the operations of the centres. The terms include an obligation to report on accomplishments for the previous period, on plans for the coming period, and on sources and uses of funds supporting the UN-related activities. It is extremely important to ensure both proper oversight and a continuing link between any given centre and on-going work.

In terms of questions that have been raised across ECE, the responses are provided below:

1. Is there clear formulation of deliverables (action plans that are reviewed and updated periodically)?

12. Yes. The centres have terms of reference that set forth what is expected of them, they are coordinated among each other regularly, and they report on their forward programmes to their relevant ECE body.

2. What sort of accountability and oversight mechanisms ensure that partners deliver on the partnership agreement and adhere to agreed conduct?

13. There are some key mechanisms. The formal mechanism is the regular reporting to the relevant ECE body. Additional informal mechanisms are the ongoing coordination of the centres' activities and ECE's process (underway) of reviewing the effectiveness of MOUs.

3. Is there periodic reporting that demonstrates measurable impact of the partnership and benefits for our membership?

14. The reporting of achievements and forward plans are developed every year. The HPB network has developed a set of KPIs both collective for the network and individual for each centre. The idea of key performance indicators (KPIs) could be better formalised and extended more broadly.

4. What sort of regular reviews ensure that the partnership remains relevant and fully aligned to organizational priorities.

15. Each of the centres is relatively young. The only review to date was provoked by the general ECE review of MOUs and other partnership structures. Each MOU has a renewal clause, and appraisal of the effectiveness of the MOU occurs at the moment of renewal.

5. Are there templates to guide the formulation of future agreements and ensure a common approach, including criteria for the selection of partners.

16. Absolutely, with the standard MOU, criteria to qualify as a centre, and terms of reference. Those three documents do not qualify as templates as that would create too-rigid structures, but they facilitate a point of departure and ensure a common vision and common mechanisms.

IV. Description of the Centres

A. International Centre of Excellence on High Performance Buildings

17. The International Centres of Excellence on High Performance Buildings (ICE-HPB) comprise a collaborative network of organisations focused on supporting their local industry in the rapid development of next generation of buildings consistent with United Nations Framework guidelines for energy efficiency standards in buildings. Centres provide education, training, and other critical resources to regional building industry practitioners, while sharing these resources globally through collaboration with other network participants.

1. Mission

18. Advance the rapid transition to high performance buildings, locally and around the world, in support of the SDGs and Paris Climate Agreement, while fostering a thriving building industry that creates healthy, comfortable, and sustainable buildings everywhere for everyone.

2. Criteria for ICE-HPB designation

- Committed to the objectives of the Framework Guidelines, including dissemination, training, and education;
- Committed to the objectives of and active engagement across the network of International Centres of Excellence and the Global Building Network;
- Established as a going concern/legal entity with strong relationships in the local buildings communities;
- Must have (local) political support and visibility;
- In compliance with norms and requirements regarding potential conflicts of interest;
- Demonstrated competency and capacity in the areas of high-performance buildings and training;
- Self-funded;
- Must have physical infrastructure (or access to it), including organizational infrastructure and a regional ecosystem that primes the centre for success, and demonstrated delivery mechanism; and
- Committed to an agenda relevant to the local region based on an agreed menu of activities and projects.

3. Terms of reference for an ICE-HPB

19. The mission of a given centre, as an ICE-HPB designated by the UNECE, is to advance the principles of the UNECE Framework Guidelines for Energy Efficiency

Standards in Buildings by connecting real estate and design professionals to energy efficiency solutions through education, training, technical assistance, demonstrations, resources, and research. The centre identifies opportunities, navigates barriers to adoption, brokers relationships, and showcases best practices through its partners, projects, data and performance statistics, and published case studies, and will share resources globally through the ICE-HPB network.

20. The centre helps building developers, owners, operators, and designers save energy and reduce building-based carbon emissions through implementation and adoption of energy efficiency measures and best practices. The centre's activities directly support climate action agendas and are consistent with the UNECE Framework Guidelines for Energy Efficiency Standards in Buildings.

21. The activities and projects of the ICE-HPB will include:

(a) Convening dialogue amongst local and international industry leaders to identify challenges, share best practices and build a growing and diverse community of practice;

(b) Gather and disseminate knowledge directly, and through partner organisations, including education and training, exhibits, case studies, research, demonstration projects, and the production of industry focused print and on-line resources;

(c) Catalyse design and construction industry tools and training development, and identify potential barriers to adoption and implementation; and

(d) Foster public demand and support for best practices through recognition and awards, open houses and tours, communication and marketing campaigns, public events, and demonstration projects.

22. An ICE-HPB will report to the Group of Experts on Energy Efficiency on prior year achievements and plans for the coming period.

B. International Centre of Excellence on Sustainable Resource Management

23. International Centres of Excellence for Sustainable Resource Management (ICE-SRM) are a collaborative network of organisations focused on supporting sustainable investment in the resources needed for development in line with the 2030 Agenda for Sustainable Development and the Paris Climate Agreement. The Centres are conceived to provide policy support, technical advice and consultation, education, training, dissemination, and other critical activities for managers and stakeholders involved in sustainable development of national resource endowments.

1. Mission

24. Advance global deployment of the UNFC and UNRMS system to secure, sustainably, the resources needed to support attainment of the 2030 Agenda.

2. Criteria for ICE-SRM Designation

- Committed to attaining the objectives of the UN to deploy and disseminate UNFC and UNRMS, including research, testing, technical advice, training, education, advocacy and certification.
- Committed to the objectives of and active engagement across the network of International Centres of Excellence.
- Established as a going concern and a legal entity with strong relationships in the regional, national and local resource development community.
- Must have regional, national and local political support and visibility;
- Committed to an agenda relevant to regional, national and local needs based on an agreed menu of activities and projects;

- Committed to innovation, continuous development and excellence in all areas including the social, environmental, economic and technological aspects of resource management and to the overall integrated efficiency in providing resource-based services to the populations;
- In compliance with norms and requirements regarding potential conflicts of interest;
- Demonstrated competence and capacity in sustainable resource management;
- Self-funded and able to support a central UNECE resource management hub in kind and financially: and
- Must have physical infrastructure (or access to it), including organizational infrastructure and a regional ecosystem that primes the centre for success, and a demonstrated delivery mechanism.

3. Terms of Reference

25. The mission of an ICE-SRM designated by the ECE is to support secure, affordable and sustainable resource-based services through global dissemination of UNFC and UNRMS and their locally adapted applications. This will be achieved through research, testing, consultation, education, advocacy and certification. The ICE-SRM identifies opportunities, navigates barriers to efficient resource management, brokers public-private relationships, and showcases best practices and shares results globally through the ICE-SRM network. The ICE-SRMs directly support stakeholders in achieving the objectives of the 2030 Agenda for Sustainable Development. The activities and projects of an ICE-SRM will include:

- Conduct training, including certification and recognition procedures for competent persons;
- Conduct research on efficient, integrated and sustainable resource management;
- Conduct testing, case studies and demonstration of UNFC and UNRMS;
- Conduct consultations in specific areas of sustainable resource management at the levels of policy formulation, government resource management, industry business process management and capital allocation; and
- Prepare training materials for universities and organisations and conduct educational courses, workshops and conferences.

4. Contribution to further development and maintenance of UNFC and UNRMS

- Develop application of UNFC and UNRMS in line with the three axes of (a) social-environmental-economic viability, (b) technical feasibility and (c) degree of confidence for public and private sector uses;
- Develop principles for public private partnerships emphasizing the importance of government set framework conditions, industry adaption of capabilities and the capital market's ability to finance valid business models that the two generate;
- Develop a technology innovation platform to address challenges in sustainable resource management;
- Develop and implement financial reporting guidelines in collaboration with financial institutions; and
- Develop and implement a "competent person" mechanism, including qualification guidelines and procedures.

5. Advocacy

- Gather and disseminate knowledge directly and through partner organizations, including education and training, exhibits, case studies, research, demonstrations, and the production of industry focused print and on-line resources, including in languages other than English;

- Catalyse industry tools and training development;
- Identify and address potential barriers to adoption and implementation;
- Foster public demand and support for best practices through recognition and awards, public events, and demonstrations; and
- Support resource management improvements through i.e. uptake in the use and/or legislation of UNFC and UNRMS by countries, companies, regulators, financial reporting sector and other organizations.

6. Outreach

- Conduct outreach workshops;
- Institute a dedicated website that is linked to the ECE website;
- Prepare and disseminate publications and documentation;
- Present at key venues;
- Promote and disseminate with respect to transparency and corporate reporting requirements;
- Support dialogue among international practitioners to identify challenges, share best practices and build a growing and diverse community of practice;
- Promote global recognition of UNFC and UNRMS as brands in resource classification and management. Work with countries, companies, and other organisations to advocate their uptake; and
- Provide strategic consultancy services to governments, industry and the financial sector.

C. International Centres of Excellence on Coal Mine Methane

26. The activities of the Centres are linked to the expected accomplishment (a) "Improved policy dialogue and cooperation among all stakeholders on sustainable energy issues, in particular energy efficiency, cleaner electricity production from fossil fuels, renewable energy, coal mine methane, mineral resources classification, natural gas and energy security" of Subprogramme 5 "Sustainable Energy" of the ECE Programme budget for 2018-2019. They also contribute to the attainment of the objective of the Subprogramme 5 "Sustainable Energy": "to ensure access to affordable and clean energy for all and reduce greenhouse gas emissions and the carbon footprint of the energy sector in the region", as defined in the ECE Proposed programme budget for 2020. The Group of Experts on Coal Mine Methane is mandated by the Committee on Sustainable Energy to carry out concrete, result-oriented activities that promote the reduction of greenhouse gas emissions from coal mines through recovery and use of methane, in order to reduce the risks of explosions in coal mines (ECE/EX/7). The principal area of work of the Group of Experts is best practice guidance for effective drainage, recovery and usage of CMM, which is achieved including through collaboration with key stakeholders such as the existing Centres of Excellence.

ICE-CMM are tasked with carrying out the following concrete activities and projects:

- Solicit and collect relevant case studies and best practices in sustainable CMM management, provide as needed technical guidance for their development, and serve as a depositary of such cases and practices;
- Organise on-site training and visits to ICE-CMM (on a non-profit basis, using as needed cost-sharing mechanisms) by CMM practitioners from interested UN Member States. Such training would help disseminate best practices through concrete hands-on experience;
- In collaboration with the secretariat and members of the Group of Experts on CMM, organise off-site training activities on the application of best practices in various coal mining regions;

- Conduct research in its domain of work, as requested by ECE member States, under auspices of the Group of Experts on CMM, and in collaboration with relevant intergovernmental and non-governmental organizations, industry and other stakeholders in the CMM field;
- Engage with a wider coal mining community, including the civil society, mining associations, and decision-makers through the use of electronic and social media in order to raise awareness of the challenges and opportunities in the CMM sector.