Draft Conclusions and Recommendations arising from the tenth session of the Group of Experts on Energy Efficiency[[1]](#footnote-2)

 **Draft for discussion**

**version 25 September 2023**

**[Agenda item 1: Adoption of the agenda]**

**Agenda item 2: Opening remarks**

1. The Chair of the Group of Experts on Energy Efficiency (the Group of Experts) delivered opening remarks summarizing the progress achieved during the intersessional period.

2. The Group of Experts noted particularly the support towards increased systemic efficiency through advancements in economic, technical, and policy research in line with the 2030 Agenda for Sustainable Development, spanning across buildings, industry, transport, and other end-use sectors in view of helping attain energy system resilience, along with progress on research and dissemination of findings on the role of digitalization in optimizing the complex energy systems.

3. The Group of Experts also noted joint activities undertaken with other subsidiary bodies of the Committee on Sustainable Energy and cross-sectoral collaboration within the United Nations Economic Commission for Europe (ECE).

**Agenda item 3: Elections of officers**

4. The Group of Experts elected [to be updated] as Vice-Chairs with effect from the close of the tenth session for two years until the close of the twelfth session. Members elected to the Bureau at the ninth session in 2022, will continue their service until the end of the eleventh session.

5. The Bureau of the Group of Experts comprises: [to be updated]

6. The Co-Chairs of the Task Forces are *ex officio* members of the Bureau of the Group of Experts. The Chair of the Group of Experts is *ex officio* Vice-Chair of the Committee on Sustainable Energy.

**Agenda item 4: Activities and priorities of the Committee on Sustainable Energy and matters for consideration by the Group of Experts**

7. The secretariat provided an overview of recent activities of the Committee on Sustainable Energy following its thirty-second session, 13-15 September 2023, as well as decisions taken by the parent bodies related to the work of the Group of the Experts.

8. The Group of Experts reconfirmed its intention to lead the work on exploring matters related to scaling systemic efficiencies and digitalization of energy system networks, including aspects of energy storage and cybersecurity, as well as its readiness to contribute, within its scope of expertise and in line with the United Nations Economic Commission for Europe Platform on Resilient Energy System Work Plan (ECE/ENERGY/2023/11), to activities related to:

 (a) Sustainable resource management and access to critical raw materials to help countries understand what resources they have available;

 (b) Low-, zero- and negative-carbon technology interplay;

 (c) Scaling systemic efficiencies & digitalization of energy system networks;

 (d) Just Transition; and

 (e) Urban planning and modelling of decentralized energy systems.

9. [to be updated]

**Agenda item 5: Plenary session**

*Documentation:* ECE/ENERGY/2023/11 – United Nations Economic Commission for Europe Platform on Resilient Energy Systems Work Plan

10. The discussion on “Increasing energy resilience, saving costs, and curbing emissions with systemic efficiency approaches” gathered [to be updated] and focused on [to be updated].

11. The Group of Experts requested the Bureau, with support from the secretariat, to continue the activities that contribute to increasing the reliability, resilience, and sustainability of energy systems in the ECE region, and to consider and formulate possible new activities in support thereof.

12. [to be updated]

**Agenda item 6: Digitalization and energy system resilience**

*Documentation:* ECE/ENERGY/GE.6/2023/3, ECE/ENERGY/GE.5/2023/3 – Key considerations and solutions to ensure cyber resiliency in the smart integrated energy systems

ECE/ENERGY/GE.6/2023/4, ECE/ENERGY/GE.5/2023/4 – Improving efficiency and reliability of energy systems by means of big data analytics

13. The Group of Experts took note of the progress and acknowledged the contributions that the Task Force on Digitalization in Energy has made in advancing the respective agenda in ECE, including within the Committee on Sustainable Energy and across its subsidiary bodies. Recommended continuation of work on Digitalization in Energy in support of the high-level theme of the Commission at its 70th session (18-19 April 2023) “Digital and Green Transformations for Sustainable Development in the Region of the Economic Commission for Europe” and in line with the decisions taken.

14. Having reviewed the documents Key considerations and solutions to ensure cyber resiliency in the smart integrated energy systems (ECE/ENERGY/GE.6/2023/3, ECE/ENERGY/GE.5/2023/3) and Improving efficiency and reliability of energy systems by means of big data analytics (ECE/ENERGY/GE.6/2023/4, ECE/ENERGY/GE.5/2023/4), the Group of Experts:

(a) Observed that structural support is needed in the form of national cybersecurity strategies that describe prevention and management of cyberattacks on smart integrated energy systems, collaboration with other countries to benchmark standards and share information on potential threat actors in order to manage cybersecurity risks more effectively, and to ensure proper allocation of responsibilities of cybersecurity in the energy sector governance at national, regional, and international levels to mitigate risks of cyberattacks resulting in power outages and system failures.

(b) Underscored that regulatory measures enforcing implementation of applicable standards and guidelines which address matters of improving cybersecurity for operational technology in automation, control systems, and cybersecurity for critical infrastructure are necessary for reliability of energy systems.

(c) Recommended to consider development of specifically designed financial products offering tax incentives for companies that have implemented relevant cybersecurity standards, as well as allocation of funding for cybersecurity initiatives such as cybersecurity-related research and development and education programmes, to ensure that best practices for cyber-prevention are maintained at every level of an organization.

(d) To implement cybersecurity measures at both management and technical levels, recommended provision of education and training to companies and governmental bodies, and proposed opening up funding opportunities to promote and drive activities for reporting to official bodies, bottom-up strategy planning, and awareness-raising to encourage lead-by-example practices.

(e) Also recommended establishment of structures for the unification of international and national standards and regulations to curate, manage and safeguard data, and data architectures to develop and deliver turnkey services for data owners, as well as to establish jurisdiction-relevant regulations around data monetization.

(f) Further recommended to explore funding opportunities for data and learning models to be made available across countries, companies and curricula. More research into application of findability, accessibility, interoperability, and reusability (FAIR) principles for data is needed, notably for data assets acquired but untapped (‘dark data’).

(g) Deemed advisable the establishment of national and international testbeds for large-scale, cross-discipline collaboration to ensure the cyber-safety of smart Internet-of-Things devices and the connected grid.

(h) Encouraged investments in human capital for skills translations and up-skilling of current and future work force, to take advantage of ever greater computing power, data architecture technologies, and data sets.

(i) Noted the potential benefits of the development of cost recovery models that show customer benefit for the capital investments made into a more resilient energy system through the design and deployment of data collection, management, analytics, and Artificial Intelligent (AI) infrastructures.

(j) Took note of the presented case studies developed by the Task Force on Digitalization in Energy. Expressed support for continuation of this work, notably to enhance countries’ efforts in the areas of cybersecurity, grid edge management, AI, and smart buildings.

(k) Highlighted the need for focused research on funding models for those areas in greatest need of attention, such as: Big Data technology advancement (e.g., natural language processing, digital twin modelling, demand and load forecasting, optimized machine learning, progression of AI capabilities to include large language models, power grid resiliency, infrastructure investment - particularly as it relates to data access, storage, management, and real-time analytics), in line with the Work Plan of the Group of Experts on Energy Efficiency for 2024-2025 and the planned activities of the Task Force on Digitalization in Energy contained therein.

15. Encouraged the member States to support activities of the Task Force on Digitalization in Energy through in-kind contributions and extrabudgetary funding.

**Agenda item 7: Improving energy efficiency in buildings**

16. The Group of Experts:

(a) Took note of the implementation progress of the preparation phase of the project “Improving the energy efficiency of the global building supply chain industry and its products to deliver high performance buildings” and the related activities.

(b) Also took note of the report on the activities in the framework of the High Performance Buildings Initiative aimed to advance energy efficiency standards in buildings in the ECE region. Aligned itself with the respective recommendation contained in the Report of the Committee on Sustainable Energy on its thirty-second session (ECE/ENERGY/149).

(c) Expressed its readiness to contribute, within the scope of its expertise and that of the Joint Task Force on Energy Efficiency Standards in Buildings, to promoting and scaling-up energy efficiency in public and municipal buildings, notably as related to introduction of energy management information systems (EMIS) and municipal energy management systems (MEMS), in the ECE member States and formulate possible activities in support thereof.

**Agenda item 8: Improving energy efficiency in industry**

*Documentation:* ECE/ENERGY/GE.6/2023/5 – Advancing energy resilience and decarbonization across the ECE region: analysis of macro-level status quo and action points for the industrial sector

ECE/ENERGY/GE.6/2023/6 – Advancing energy resilience and decarbonization across the ECE region: unleashing the potential of energy storage and demand-side flexibility

17. The Group of Experts:

(a) Observed that the proportion of the overall energy consumption of industry varies significantly across member States. Noted that the availability of cleaner forms of energy, including renewable energy, lags behind in most of the member States.

(b) Took note that, in many instances, the substitution of electricity and other energy demand from industry is not possible at the current level of cleaner forms of energy generation, including renewable energy. Also took note that approximately two-thirds of the emissions of the industrial sector are energy-related and one third is process-related, e.g. stem from chemical reactions. [~~In view of the above, underscored that in consequence, the means of industry to curb emissions are limited to the availability of adequate cleaner forms of energy.~~ Underscored that energy efficiency improvement, however, allows to reduce emissions independently of energy supply.]

(c) Noted that electrification of industrial processes reduces the dependence on largely fossil forms of energy (gas, coal, oil, etc.), however often requires a change of the process and parts of the equipment thus affecting the financial feasibility and the time frame of its implementation. Additionally, recognized that a substitution of the currently used fuels with hydrogen is dependent on its availability in sufficient amounts at affordable prices and technological readiness. Underscored in this regard that energy resilience, cost-competitiveness, and reduction of emissions in the industrial sector are best served by emphasising systemic efficiency measures that imply on-site measures [(e.g. heat recovery by means of process integration)] in parallel to the expansion of generation capacity based on cleaner forms of energy, including renewable energy, and of associated transmission and distribution grids.

(d) Stressed that increasing systemic efficiency in the industrial sector requires measures tailored to individual companies that consider alternative locally available energy (and other) sources and categories of industrial processes and their technical requirements. Argued that such an approach would take account of process-related conversion losses, unnecessary energy use (wasted energy), as well as ways to harness wasted energy (electricity, heat) and rationalize use of resources [(e.g. by smart control and by industrial heat pumps, where applicable)]. In this context, underscored that micro, small, and medium-sized enterprises require particular support.

(e) Recognized that process heating and cooling is responsible for more than sixty percent of industrial energy use, and thus recommended development of capacity-building programmes to help make better use of commonly unused waste-heat potentials. Noted in this regard that process heating and cooling is often powered by fossil fuels-based combustion processes, thus in some instances waste-heat utilization may present a potential for improving security of energy supply. [Pointed out that waste-heat recovery may be implemented in the form of improved Heat exchanger networks (HEN) in combination with industrial heat pumps, heat storage and renewable energy supply. Emphasized that the mobilization of these potentials requires major efforts related to training, equipment development and manufacture (e.g. industrial heat pumps) as well as incentives for implementation by manufacturing companies.] [~~In this regard~~ Also] took note that embracing circularity principles, has the prospects of reducing product-related emission footprints and the potential of reducing challenges related to price and availability of raw materials and interim products, and as such boosts energy system resilience. Encouraged further exploration of the related matters jointly with the Expert Group on Resource Management, the Group of Experts on Gas and its Hydrogen Task Force, and the Group of Experts on Renewable Energy.

(f) Acknowledged that the flexibility to adjust energy demand of end use sectors to the amounts of energy available (dispatchable) at any given time, would contribute to a more stable energy system and further enable stakeholders to avoid peak-pricing. Recommended to continue exploring means to increase demand-side flexibility in view of accommodating the expansion of the generation capacity of intermittent energy coupled with various forms of system-level and on-site energy storage options.

(g) At the same time, noted that the large range of different types of storage calls for deeper investigation [and international collaboration] to enable member States, energy system operators, and end-users to enhance their energy security while reducing the exposure to volatility of energy price and supply. In view of this, deemed advisable to continue research in this direction and to prepare, in cooperation with relevant subsidiary bodies of the Committee on Sustainable Energy, a report on energy storage options based on the scoping study contained in the document Advancing energy resilience and decarbonization across the ECE region: unleashing the potential of energy storage and demand-side flexibility (ECE/ENERGY/GE.6/2023/6). A future report could:

(i) Explore how different types and levels of storage [as well as industrial energy efficiency measures] can support and increase the energy system resilience, expedite and reduce the costs of transport decarbonization, and ensure the best use of intermittent renewable energy;

(ii) Explore funding opportunities to design and develop policy frameworks and regulatory mechanisms that are needed to incentivize adoption and integration of energy storage technologies [as well as industrial energy efficiency measures].

(iii) Develop business models that address proper integration of energy storage [as well as industrial energy efficiency measures] with other technologies and fair participation of energy system actors (suppliers, consumers, prosumers) in the operations, as well as environmental considerations. Research financial products that can facilitate a broader rollout and adoption of system-, local-, and micro-level energy storage.

(iv) Further explore how digital solutions can help optimize energy storage [as well as industrial energy efficiency measures] and enable demand-side flexibility.

(h) Recognized that digital approaches can facilitate, enhance and expedite harnessing energy-, emission-, and cost-saving potentials, and appreciated the efforts made by the Task Force on Energy Efficiency in Industry to joint research on applicability of digital tools to scale-up, ease access, and facilitate decarbonization of industrial sector.

(i) Acknowledged the value of collaboration networks, knowledge, training, and capacity-building platforms, tools to gather and aggregate demand-side evidence, as well as thematic discussion fora to facilitate exchange of knowledge.

**Agenda item 9: Exploring pathways for a balanced integration of** **electric mobility**

18. The Group of Experts:

(a) Noted the contribution to the activities of the ECE Sustainable Transport subprogramme in exploring general trends and developments surrounding electric vehicles and their charging infrastructure. [Pointed out the high potential relevance of smart charging and vehicle-to-X to enable demand-side flexibility.]

(b) Recognized, in keeping with the observations made at ECE Working Party on Transport Trends and Economics (WP.5) at its 36th session, that facilitating progress in electric mobility calls for establishment of a dedicated informal task force that would focus on coordinating efforts related to EV developments and their charging infrastructure both within ECE and in collaboration with other concerned institutions. Expressed readiness to work in close consultation with WP.5 and subsidiary bodies of the Committee on Sustainable Energy, notably the Group of Experts on Cleaner Electricity Systems, on the development of draft terms of reference for such a task force.

(c) Agreed to continue explore opportunities for securing in-kind contributions and extrabudgetary funding including from partner organizations for specific projects, notably focused on activities related to promoting the use of geo-spatial data in the provision of energy services to electric mobility to increase location efficiency.

(d) Discussed that electric mobility can also be considered to include railways, notably electricity powered trains. Recognizing that electrification of railway lines comes along with significant investments and lead-up time which may not be economic on less frequented routes, noted that innovative charging technologies allow deployment of battery-electric or hydrogen-electric trains particularly in locations where electrification is deemed economically inefficient.

(e) Noted the relevance of systemic efficiency also in individual, public and freight transport. Recognized that location efficiency and accessibility play a central role in reducing the mobility needs, thus also linking buildings, industry, transport, and infrastructure through land use. Recommended to explore the concept of location efficiency, accessibility, and land use.

**Agenda item 10: Implementation of the Work Plan of the Group of Experts on Energy Efficiency for 2024-2025**

*Documentation:* ECE/ENERGY/2023/10 – Work Plan of the Group of Experts on Energy Efficiency for 2024-2025

19. The Chair provided an update on the progress in implementation of the Work Plan of the Group of Experts for 2022-2023 (ECE/ENERGY/2021/10). The main thematic areas that formed the basis for the Group of Experts’ work in the 2022-2023 period include: (A) Improving Energy Efficiency in Industry; (B) Improving Energy Efficiency in Buildings; (C) Digitalization in Energy; (D) Regulatory and Policy Dialogue Addressing Barriers to Improve Energy Efficiency; (E) Assessing Energy Consumption and Emissions of Electric Vehicles.

20. The Group of Experts:

(a) Took note of the progress in implementation of the Work Plan of the Group of Experts for 2022-2023.

(b) Welcomed approval by the Committee on Sustainable Energy at its thirty-second session (13-15 September 2023) of the Work Plan of the Group of Experts for 2024-2025 (ECE/ENERGY/2023/10), which contains the following five sections: (A) Supporting energy efficiency improvement and decarbonization in industry; (B) Develop, update, and disseminate energy efficiency standards aimed at raising energy performance of buildings and improving the built environment; (C) Unlocking the potential of energy system efficiency through digitalization; (D) Development of approaches for a balanced integration of electric mobility; (E) Regulatory and policy dialogue addressing barriers to improve energy efficiency.

(c) Recognized that collaboration across the subsidiary bodies of the Committee on Sustainable Energy, the other ECE subprogrammes, and engagement of relevant external groups is key to ensure timely and quality deliverables.

(d) Deemed securing extrabudgetary resources critical for attainment of the objectives and deliverables in the Work Plan for 2024-2025, and encouraged the Bureau to make efforts to explore funding opportunities through extrabudgetary projects.

20. [to be updated].

**[Agenda item 10: Any other business]**

21. [to be updated].

**Agenda item 11: Dates of the next meeting**

22. The eleventh session of the Group of Experts is scheduled to take place in Geneva on 16 and 17 September 2024.

**Agenda item 12: Adoption of conclusions and recommendations**

23. The Group of Experts adopted the conclusions and recommendations arising from the tenth session.

**Agenda item 13: Adoption of the report and close of the meeting**

24. The meeting report was adopted subject to any necessary editing and formatting.

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1. The draft conclusions and recommendations will be reviewed by the Group of Experts after each agenda item and updated as needed. [↑](#footnote-ref-2)