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Committee on Sustainable Energy

Group of Experts on Cleaner Electricity Systems

Nineteenth session
Geneva, 3-4 October 2023

Report of the Group of Experts on Cleaner Electricity Systems on its nineteenth session

I. Introduction

1. The nineteenth session of the Group of Experts on Cleaner Electricity (the Group of Experts) was held during two days from 3 to 4 October 2023.

2. This report summarizes the proceedings of the Group of Experts at its nineteenth session. All the documents related to the session are available on the website of the United Nations Economic Commission for Europe (ECE).[1]

II. Attendance

3. The session of the Group of Experts was live streamed from the United Nations Office at Geneva and was attended in-person by 28 participants. Additionally, 4 contributed to the session by providing their pre-recorded video addresses.

4. Experts from the following ECE member States participated: Canada, Czechia, France, Germany, Romania, Russian Federation, Switzerland, United Kingdom of Great Britain and Northern Ireland, and United States of America. The session was attended by representatives of the European Union.

5. None of the United Nations specialized agencies, funds and programmes were in attendance.

6. The meeting was also attended by representatives of major groups including non-governmental organizations, local authorities, business and industry, and scientific and technological community, and other stakeholders including independent experts.

[1] Official documents, room documents, presentations and video addresses delivered at the meeting, as well as other relevant materials are available on the ECE website (see https://unece.org/sustainable-energy/events/group-experts-cleaner-electricity-systems-nineteenth-session). Official documents of the session are also available at Official Document System of the United Nations (see http://documents.un.org/).

III. Adoption of the agenda (agenda item 1)

Documentation: ECE/ENERGY/GE.5/2023/1 – Annotated provisional agenda

7. In accordance with Rule 7 of the Rules of Procedure of the Commission (E/ECE/778/Rev.5), the first item of the provisional agenda was the adoption of the agenda.

8. For and on behalf of the Chair of the Group of Experts, Mr. Jim Robb, a Vice-Chair of the Group of Experts, Mr. Sylvain Clermont, presented the annotated provisional agenda as contained in ECE/ENERGY/GE.5/2023/1. The annotated provisional agenda for the nineteenth session of the Group of Experts was adopted.

IV. Opening remarks (agenda item 2)

9. Opening remarks were delivered by pre-recorded video address by the Chair of the Group of Experts, Mr. Jim Robb. The Chair highlighted the timeliness and relevance of topics proposed for discussion at the session, in view of a number of issues that energy systems of the ECE region were facing. Although underscoring the contingence of certain activities of the Group of Experts on extrabudgetary resources which did not materialize in 2022-2023, the Chair appreciated the work done by the Group of Experts in the framework of achieving balance between environmental sustainability, affordability, and security of the energy systems, notably electricity systems. Concluding, the Chair handed over the Chair to the Vice-Chair of the Group of Experts.

10. The Vice-Chair, Mr. Sylvain Clermont, summarized the progress achieved by the Group of Experts during the intersessional period in the implementation of the Work Plan of the Group of Experts for 2022-2023 (ECE/ENERGY/2021/8). The main thematic areas that formed the basis for the Group of Experts' work in the 2022-2023 period include: (A) Electricity as a driver for achieving deep transformation of the energy system; (B) Technology interplay under a carbon neutral energy system; (C) Modernization and decarbonization of electric power systems in ECE subregions; (D) Digitalizing electricity systems. The Group of Experts took note of the results achieved in the course of implementation of its Work Plan for 2022-2023.

11. The Vice-Chair highlighted particularly the progress in addressing, jointly with other subsidiary bodies of the Committee on Sustainable Energy (the Committee), the aspects of:

(a) Improving electricity system resilience, including through deployment of energy storage options and increasing energy connectivity;

(b) Changing patterns of energy end uses, including integration of electric mobility and other smart assets at the grid edge, impacting reliability of the energy system;

(c) Cybersecurity of digitalized energy systems.

V. Election of officers (agenda item 3)

12. The secretariat received the following nominations from the ECE member States to stand for election at the nineteenth session of the Group of Experts: Mr. Jon Gibbins (United Kingdom of Great Britain and Northern Ireland) and Mr. Furugzod Usmonov (Tajikistan) as Vice-Chairs.

13. The Group of Experts elected Mr. Jon Gibbins (United Kingdom of Great Britain and Northern Ireland) and Mr. Furugzod Usmonov (Tajikistan) as Vice-Chairs. The Bureau of the Group of Experts (the Bureau) also invited Mr. Vladimir Budinsky and Mr. Sylvain Clermont to continue their service on the Bureau as Vice-Chairs to strengthen its activities.

14. The term of office for the elected members of the Bureau is two years.

15. The Group of Experts has the following members to serve on the Bureau:

(a) Until the conclusion of its twentieth session: Mr. Jim Robb (United States of America), as Chair; and Mr. King Lee (World Nuclear Association), Mr. Andrew Minchener

(International Centre for Sustainable Carbon), and Mr. Antoine Herzog (Électricité de France) as Vice-Chairs;

(b) Until the conclusion of its twenty-first session: Mr. Jon Gibbins (United Kingdom of Great Britain and Northern Ireland), Mr. Furugzod Usmonov (Tajikistan), Mr. Vladimir Budinsky (ZSDNP) and Mr. Sylvain Clermont (DigiTransfo Expertise) as Vice-Chairs.

16. The Chair of the Group of Experts is *ex officio* Vice-Chair of the Committee.

VI. Activities and priorities of the Committee on Sustainable Energy and matters for consideration by the Group of Experts (agenda item 4)

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

18. The Regional Advisor provided an overview of projects, studies, meetings and events, and other collaboration activities relevant to the work of the Group of the Experts.

19. The Group of Experts reconfirmed its intention to lead and/or to contribute, within its scope of expertise and in line with a joint and collaborative multistakeholder process to shape the Platform on Resilient Energy Systems, 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) Just Transition; and

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

20. The Group of Experts also reconfirmed its intention to continue assessing the adequacy of proposed solutions to meet continuity of electricity supply.

VII. Plenary session (agenda item 5)

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

21. The Group of Experts discussed the matters of relevance to ensuring reliable, resilient, and secure energy systems in the ECE region, and identified a set of aspects found crucial for that purpose. Aligned with the outcomes of deliberations by the Committee at its thirty-second session, the Group of Experts stressed particularly the aspects of:

(a) Improving resilience of electricity system alongside its major transition, through measures including deployment of energy end use management, development of low-carbon dispatchable power sources and storage options, increasing energy connectivity, supporting a favourable power market design, and changing the planning mindset;

(b) The impacts of changing patterns of energy end uses, including in consequence of increasing integration of electric mobility (e-mobility) and other smart assets at the grid edge, on reliability of the energy system;

(c) The need to adapt to the regional context;

(d) Unlocking the potential of energy system efficiency through digitalization, including issues related to cybersecurity and data analytics and the use of Artificial Intelligence.

22. The Group of Experts:

(a) Requested the Bureau, with support from the secretariat, to consider and formulate activities that would further support efforts to increase the resiliency of the energy systems in the ECE region;

(b) Noted that the expanded scope of activities requires extrabudgetary funding and in-kind contributions from stakeholders and called upon member States and other interested parties to consider providing support necessary for delivering on such activities.

VIII. Achieving net-zero emissions power systems (agenda item 6)

Documentation: ECE/ENERGY/GE.5/2023/5 – Transitioning to net-zero emissions power systems – common principles for reliability of supply

23. The document "Transitioning to net-zero emissions power systems – common principles for reliability of supply" (ECE/ENERGY/GE.5/2023/5), developed in support of the activities of the Committee on Sustainable Energy, was presented. The document explores the risks of possible unintentional losses in system reliability during energy transition and discusses the issue of retention of sufficient dispatchable capacity amid transitioning to net-zero emissions electricity systems, to maintain grid reliability and resilience. A subsequent panel discussion further addressed the related matters.

24. The Group of Experts:

(a) Observed that ambitious climate mitigation and adaptation policies, advocating for rapid development and implementation of low-carbon power production options, can pose a significant challenge to the power generation sector of member States, if they do not have sufficient capacity for such quick and profound transformation;

(b) Acknowledging the investment requirement for the attainment of Sustainable Development Goal 7 and other Goals in relation to energy of the 2030 Agenda for Sustainable Development, recommended to continue exploring and assessing market mechanisms and financing conditions that could contribute to the transformation of the electricity systems toward the net-zero aspirations while still maintaining reliability and affordability;

(c) In the framework of the panel discussion, addressed the challenges related to integration of distributed energy resources, energy storage and role of energy end users, energy efficiency and conservation, and optimization of grid operations in the context of the electrification trend that requires a massive increase in the scale of the electricity grid;

(d) Observed that international standards governing grid support performance of inverter-based resources (solar photovoltaics, wind, battery energy storage, etc.), as well as modelling for their behaviour as they continue to grow on the electricity grid, are essential. Called, therefore, on the member States for the development of common international standards for the reliable operation of inverter-based resources;

(e) Noted that in certain member States, retention of key fossil-based generation assets for some period might be necessary to ensure reliability of supply to lessen the expected hardships of transition. Even though those assets are likely to be generating much less energy (and concomitant carbon emissions), they would still be providing high-value reliability services. Additionally, issues related to potential loss of employment were mentioned, urging to spread effects of energy transition over time and thus to allow the process to be conducted in more gradual and equitable manner through job preservation.

IX. Reliability and cyber resiliency of smart integrated energy systems (agenda item 7)

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

25. The Group of Experts explored, in the form of a panel discussion, the contribution that digitalization can make to the reliability of energy systems, through facilitating their efficiency by improving interconnectedness and data exchange. Following presentation of the document "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 introduction of the document "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), which the Group of Experts took note of, the discussion focused mainly on cyber resiliency in smart integrated energy systems.

26. The Group of Experts, with invited experts representing energy supply organizations and organizations active in the cybersecurity and system reliability fields:

(a) Discussed approaches to ensure cyber resiliency in smart and digitally integrated energy systems, as well as framework, considerations, and recommendations on how to ensure security of the energy system through cyber and physical integration into planning, design, and operational practices;

(b) Acknowledged that cybersecurity is a challenge for critical infrastructure, including energy systems, and noted recommendations to mitigate cybersecurity risks contained in the document "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). It was noted in this context that standards, frameworks, good practices, and operating procedures that contribute to a more cyber-resilient system, exist for operators of critical infrastructure. The importance of integrating security, including cybersecurity in the energy system design and operations, as well as products and services offered by suppliers, was highlighted;

(c) Expressed appreciation to the Group of Experts on Energy Efficiency and its Task Force on Digitalization in Energy for the close and fruitful collaboration on research in the field of digitalization of electricity systems. Encouraged continued cooperation between the Groups of Experts by proposing to join forces to:

(i) Further explore the contribution of digitalization to a more reliable, resilient and cleaner energy system;

(ii) Expand outreach through the organization of, and active participation in seminars, technical conferences, and other events; and

(iii) Further collaborate with industry groups, relevant organizations, and United Nations specialized agencies, funds and programmes active in the ECE region and other regions.

(d) In doing so, the Group of Experts would also seek to complement content in the fields of electricity systems' cybersecurity and of the Artificial Intelligence use;

(e) Agreed, in line with its mandate, to initiate an in-depth work on electricity system resilience, as well as on the importance of transmission and distribution grid modernization and digitalization to mitigate the impacts of climate change. Also agreed to further explore the role of electrification of the transportation sector, its impact on the electricity system, and at technology compatibility issues.

X. Exploring pathways for a balanced integration of electric mobility into power systems (agenda item 8)

27. After reviewing general trends and advancements in electric vehicles (EV) and charging infrastructure in the ECE region, the Group of Experts:

(a) Reconfirmed its position on the need of integrating location and operation of EV chargers (private or public) with the grid and resource planning, as EV fleet and electric

loads grow significantly. Therefore, argued that e-mobility will have as much impact on the design and operation of the electric grid as it will have on transportation systems themselves;

(b) Recognized, in keeping with the observations made at the ECE Working Party on Transport Trends and Economics (WP.5) at its thirty-sixth session, that facilitating sustainable progress in e-mobility calls for the establishment of a dedicated informal task force that would join efforts to coordinate the development of EV with the development of their charging infrastructure, within ECE and beyond in collaboration with other concerned institutions. Expressed readiness to work in close consultation with WP.5 and subsidiary bodies of the Committee, notably the Group of Experts on Energy Efficiency, 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:

(i) Integration of e-mobility into electricity systems and its impact on systems' design and operations;

(ii) EV charging management; and

(iii) Workshops and seminars to better understand issues and share findings.

XI. Implementation of the Work Plan of the Group of Experts on Cleaner Electricity Systems for 2024-2025 (agenda item 9)

Documentation: ECE/ENERGY/2023/9 – Work Plan of the Group of Experts on Cleaner Electricity Systems for 2024-2025

28. The Group of Experts:

(a) Welcomed approval by the Committee at its thirty-second session (13-15 September 2023) of the Work Plan of the Group of Experts for 2024-2025 (ECE/ENERGY/2023/9), which identifies clear deliverables and timeline under the following four sections: (A) Improving electricity system resiliency as an enabler for transformation of the energy system; (B) Supporting the creation of favourable power market design and financing conditions for the transformation of the electricity systems; (C) Assessing the contribution of digitalization to designing cleaner electricity systems; (D) Exploring the impact of e-mobility integration on the electric system design and operation;

(b) Recognized that collaboration across the subsidiary bodies of the Committee, the other ECE subprogrammes, and engagement of relevant external groups is key to ensure timely and quality deliverables;

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

XII. Any Other business (agenda item 10)

29. No issues were raised under this agenda item.

XIII. Dates of the next meeting (agenda item 11)

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

XIV. Adoption of conclusions and recommendations (agenda item 12)

Documentation: GECES-19/2023/INF.1 – Draft conclusions and recommendations arising from the nineteenth session of the Group of Experts on Cleaner Electricity Systems

31. The informal document "Draft conclusions and recommendations arising from the nineteenth session of the Group of Experts on Cleaner Electricity Systems" (GECES-19/2023/INF.1) was circulated to participants and Geneva Permanent Representations.

32. The Group of Experts adopted the draft conclusions and recommendations arising from its nineteenth session, which are included under the relevant agenda items highlighted in this report.

XV. Adoption of the report and close of the meeting (agenda item 13)

Documentation: ECE/ENERGY/GE.5/2023/2 – Report of the Group of Experts on Cleaner Electricity Systems on its nineteenth session

33. The Vice-Chair of the Group of Experts, with the assistance of the secretariat, summarized the discussions in a report, reflecting in a concise and factual manner the views expressed by participants.

34. The report of the session was adopted subject to any necessary editing and formatting.

35. Following that, the session was closed.