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Group of Experts on Assessment of Climate Change Impacts and Adaptation for Inland Transport

Twenty-fifth session
Geneva, 30 and 31 October 2023

Report of the Group of Experts on Assessment of Climate Change Impacts and Adaptation for Inland Transport at its twenty-fifth session

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I. Attendance

1. The Group of Experts on Assessment of Climate Change Impacts and Adaptation for Inland Transport (hereafter called GE.3) held its twenty-fifth session (seventh session under its new mandate) on 30 and 31 October 2023. The session was co-chaired by Ms. S. Haensel (Germany), Ms. T Popescu (France) and Mr. J. Kleniewski (Poland). It was held as an in-person meeting with online participation via Webex opened, as per the request of the Chair, for enabling broader consultations on specific agenda items.

2. Representatives of the following United Nations Economic Commission for Europe (ECE) member States participated: Canada, Denmark, Finland, France, Germany, Poland, Portugal, Russian Federation.

3. Representation of the following international organizations participated: Trans-European Railway (TER) Project, United Nations Economic Commission for Western Asia (ESCWA), United Nations Conference on Trade and Development (UNCTAD), World Association for Waterborne Transport Infrastructure (PIANC) and World Road Association (PIARC).

4. The following non-governmental organization was represented: International Union of Railways (UIC).

5. At the invitation of the secretariat, experts from the following organizations participated: Climate Sense, European Investment Bank – JASPERS (EIB-JASPERS), Global Alliance of Universities on Climate, InnoChance, National Center for Atmospheric Research, Oxford Institute for Energy Studies, University of the Aegean, University of Birmingham and ProRail.

II. Adoption of the agenda (agenda item 1)

6. GE.3 adopted its agenda as contained in ECE/TRANS/WP.5/GE.3/49.

Documentation

ECE/TRANS/WP.5/GE.3/49

III. Initiatives in climate change impact assessment and adaptation for inland transport (agenda item 2)

7. GE.3 continued its discussion on initiatives in climate change impact assessment and adaptation for inland transport with a view to understand if any approaches, tools and/or methodologies are being developed that could be integrated by GE.3 in its work. In this context, UIC updated GE.3 on its project Resilient Railways facing Climate Change: Heavy Rains (ReRa-Rain) and High Temperatures (ReRa-Temp). PIARC presented insights into economic aspects of adaption, among others on approaches for balancing the costs and benefits of adaptation. UNCTAD reported on its activities of interest to GE.3.[1]

8. University of Aegean updated GE.3 with regard to the existing state of knowledge on the evolution of the potential hazards for inland transport under climate variability and change.

[1] This included for past activities: substantive contributions to the 2023 UNDRR GAR Special Report on Mapping Resilience for the SDGs and recommendations of the SLG on DRR for Resilience; the UN Global Compact Port Guidance; presentations at the 6th UNFCCC workshop on the Global Goal on Adaptation, 2023 International Conference on Disaster Resilient Infrastructure, Santander Port Week, 2023 FAO Science and Innovation Forum, German Association of Maritime Law 125th anniversary event; and a climate change adaptation logistics workshop by the Kuehne Foundation. For upcoming events, this includes: co-organization of several COP 28 side events and the 2024 Global Supply Chain Forum, to be held in Barbados on 21–24 May 2024, organized by UNCTAD in collaboration with the Government of Barbados.

9. France presented its approach to using global warming levels (GWLs) as a reference for climate projections and adaptation to climate change strategies.

10. GE.3 thanked for the information and updates provided by UIC, PIARC, UNCTAD, University of Aegean and France. In the discussion, GE.3 agreed to consider biological changes due to climate change including loss of vegetation in its work on adaptation of transport to climate change. It also acknowledged the importance of application of nature-based solutions as part of the adaptation measures. It called for more knowledge and practice sharing in these areas. For its work on business case for adaptation, GE.3 recognised the fact that decisions are based on key performance indicators (KPIs) by transport entities, thus it should be explored and discussed further how through these common KPIs adaptation action or inaction can be made visible. Last but not least, GE.3 found it important to further discuss the marine heatwave and its trends to see how to include it in chapter on climate variability and change of its final report.

11. GE.3 also agreed that more exchanges are needs with regard to GWLs and possible advice in applications of GWL for regional climate change impact assessments, including on how to map climate scenarios defined using GWLs with RCP scenarios to enable comparisons between climate projections using those different approaches. It requested that more practices are shared in this regard.

12. Further to this discussion, PIANC agreed to present on ways to incorporate biological changes in the adaptation work. University of Birmingham expressed readiness to share experience and practices in applying nature-based solutions in adaptation of transport to climate change. University of Birmingham would also explore on providing more insight on application of GWLs for regional climate change impact assessment.

13. GE.3 considered then the annotated outline for its final report based on a proposal contained in Informal document (2023) No.5, including detailed outlines for chapters on (a) policies and legislation, (b) methodologies for assessing climate hazard, and (c) effective adaptation prepared and presented respectively by UNCTAD, Climate Sense and PIANC.

14. GE.3 welcomed the updated outline and appreciated the work done by UNCTAD, Climate Sense and PIANC. It then agreed to:

- Turn the summary for policy makers into a concise report for policy makers and support it by the technical report.
- Include in chapter I a section on good practices on the use of different approaches to climate data (RCP scenarios, SSP scenarios, GWLs) and on how climate projections based on such different approaches can be compared or mapped to each other.
- Add to chapter II of the technical report a section on implications of climate change on transport commercial laws.
- Incorporate in chapter III of the technical report, a notion in section three on which data need to be known by transport entities on their assets for assessing their exposure and sensibility and in turn their vulnerabilities to climate change.
- Adjust the title of chapter IV of the technical report to “Effective adaptation of transport systems and assets to climate change”.
- Make sure that chapter IV clarifies how adaptation can be included into asset life cycle and distinguish between preventive and reactive adaptation measures.

15. Poland pledged its contribution to chapter II of the technical report on climate proofing regulations and a case study for part 2, chapter I of the technical report on climate proofing approach in Poland.

16. Denmark volunteered to lead the work in preparation for the next session the outline or structure for the case studies for both chapters I and II of part 2.

17. GE.3 agreed that experts can send additional comments in writing on the detailed outline until the end of November 2023.

18. GE.3 also agreed to adopt a mechanism for review and comments for both reports (for policy makers and the technical report) to which end proposal should be sent to the secretariat.

19. Finally, GE.3 invited the lead authors to start developing the specific chapters as per their agreed outlines.

IV. Climate change and transport assets data (agenda item 3)

20. ESCWA presented maps with projections depicting the future changes for the following indices:

- High temperatures: annual count of days when daily maximum temperature is greater than 25, 32 and 43˚C for Europe and Central Asia.
- Heavy precipitation: annual count of days with daily precipitation greater than 50, 100 and 150mm and annual count of days with 3-day precipitation greater than 50, 100 and 150mm for Europe and 3-day precipitation greater than 50 and 150mm for Central Asia.
- Wind gust: annual count of days with a wind gust exceeding 17m/s for Europe.

21. GE.3 appreciated the work done by ESCWA in preparing the maps for Europe and Central Asia. It analysed them and drew the following conclusions:

- Maps for high temperatures with thresholds of 25 and 32 degrees Celsius should be used and described for the regions of Europe and Central Asia while maps with threshold of 43 degrees Celsius should be applied only at subregional level where they present meaningful results.
- Maps for heavy precipitation with the threshold of 50mm over 3 days should be used and described and additional maps for one day precipitation of 30mm should be developed for the regions of Europe and Central Asia. Also, regional maps presenting seasonal results for precipitation exceeding 50mm over 3-days should be prepared for further analysis, and if possible or alternatively, also maps showing the minima and maxima (for instance 90th percentiles of the model ensemble) should be developed.
- Maps for wind gust should only be used at a more subregional level. Ideas for geographical areas, mainly costal sub-regions and if related linked to sea surge, should be shared at the next session.

22. GE.3 also discussed thresholds used for the projections, the basis on which they were selected and the time periods chosen for the projections. It then requested experts to explore on thresholds that are applied in their national context to compare them against the thresholds selected for the regional projections and report at the next session. It also requested experts to check the time periods for the projections used in their countries.

23. University of Birmingham discussed a data model for wind-related delays as developed in the United Kingdom and its applicability as well as made a proposal on a structure and content of a catalogue of wind impacts.

24. GE.3 considered the proposal for developing the catalogue not only for wind impacts but also other climate change hazards. While there was support from some experts for developing a structure for the catalogue, others pointed to the need for safeguarding first a necessary buy-in from transport asset and operation managers to use the future catalogue and include event data and information therein before a decision is taken to develop it. Views were shared on a potential interest of these managers in a catalogue through which they could benchmark the performance of their assets/network in the events of specific climate change hazards to the performance of comparable assets/network in similar events and in this way also understand the degree of the adaptation/resilience of their asset/network to these events compared to similar assets/network. Ensuring interoperability between this international catalogue and the regular databases of transport infrastructure managers was also mentioned as a condition for such an initiative to succeed.

25. GE.3 agreed to hold a workshop in 2024 which would involve transport asset and operation managers and explore their interest and support in developing the catalogue of measure with specific features for benchmarking/comparing asset resilience or susceptibility to climate change hazards, and if relevant, cost of action or inaction. To this end, GE.3 invited the secretariat to establish a task force which would consist of interested experts to prepare the workshop. Experts from PIANC, PIARC, UIC and TER were invited to participate in the task force. GE.3 further recommended that the task force engages with insurance companies and multilateral developments banks for this workshop and finds a lead country to take a role of the host.

V. National and sub-national projects on climate change impact assessment and transport asset adaptation needs (agenda item 4)

26. Poland detailed the Polish guide for climate proofing for beneficiaries and investors in infrastructure and the recent revision made to it taking into account the regulatory developments in the European Union and the conclusions from the assessments of the previous version of the guide. ProRail shared its experience how it attempts to assess technical performance on the rail network from a climate/extreme weather conditions perspective and on this basis makes choices for how to prevent climate impacts on the rail performance in the future.

27. GE.3 appreciate the informative presentations. It recognized that the information on the Polish climate proofing guide should be included in the final report either as a case study or a box in Chapter II of the technical report on policies and legislation.

28. GE.3 also discussed the ProRail experience how incidents on the network are associated with the climate/weather events. GE.3 also invited ProRail to share information about heat and precipitation incidents and their costs, if available, through the survey disseminated in late 2022 by the secretariat on impacts of climate/weather related events on transport infrastructure. The secretariat was requested to disseminate the survey again among experts.

29. Denmark informed about its work to install sensors for data collection along the rail TEN-T lines to better understand the impacts from whether events on these lines. Denmark pledged to present more details on this work at the next session.

VI. Database on adaptation measures (agenda item 5)

30. University of Birmingham presented ECE/TRANS/WP.5/GE.3/2023/1 and ECE/TRANS/WP.5/GE.3/2023/2 which contain respectively the background information to the guidance and the guidance on adaptation pathways in the transport sector. The presentation was focused on changes made to the previous version of the guidance further to the comments received at the twenty-fourth meeting.

31. GE.3 welcomed the updated documents and appreciated the work done by the University of Birmingham in this regard.

32. GE.3 requested the secretariat to fix the erroneous references in the document. GE.3 also requested experts to provide material for signposting with explicit text indication in the guidance. Finally, GE.3 agreed that final comments to the guidance, if any, can be sent to the secretariat and University of Birmingham by 30 November 2023.

33. The secretariat called upon the experts to explore possibilities for case studies on the application of the guidance. In response to this call, PIANC informed that preparation of a case study for an application of the adaptation pathways methodology to a hypothetical asset could be possible and PIANC would confirm it by the next session. GE.3 invited other experts to explore opportunities for case studies.

VII. Guidelines for integrating climate change considerations in planning and operational processes (agenda item 6)

34. The Vice-chair (France) reported on the Conference on adaptation of transport in the Mediterranean region to climate change which took place in Marseille on 15 and 16 May 2023. This conference focused on raising awareness on adaptation of transport infrastructure to climate change and on setting up an effective intervention programmes. It was co-organized by ECE, ESCWA France (Directorate General of Infrastructure, Transport and Mobility and Région Provence-Alpes-Côte-d'Azur) and CETMO. It was attended by 60 participants from 15 countries. It featured not only panel discussions and presentations but also hands-on work in break-out groups on climate projections and their meaning.

35. The Vice-chair (France) also reported on the ECE foresight session organized during the PIARC World Road Congress in Prague on 6 October 2023 on stress test as a tool to assess the resilience of road asset to climate change hazard. The session featured a panel which discussed issue such as what is road asset, what are the observed impacts from extreme weather events and how they affect service provision by roads, what is an economically optimal resilience level of road asset and what are the options to carry out the stress tests. The panel was followed by a simulation of a stress-test using a qualitative method.

36. GE.3 welcomed the information on both events. It appreciated the work and effort invested by experts in particular the Vice-chair (France), the secretariat, ETH Zurich (for the foresight session) and other experts in organizing them.

37. PIARC reported on feedback form its World Road Congress and updated GE.3 on the themes and technical committees (TC) created under PIARC for the period 2024 to 2027. PIARC invited GE.3 to continue its collaboration with TC 1.4 on planning the resilience of road networks – climate change and other hazards.

38. GE.3 thanked for the update and pledged to continue its collaboration with PIARC TC 1.4.

39. GE.3 considered then ECE/TRANS/WP.5/GE.3/2023/3 which contains the updated framework for transport system stress test to climate change hazard. GE.3 welcomed the document and thanked all the experts engaged in preparation of the framework for their work. It endorsed the framework and requested the secretariat to explore a possibly to publish it separately to the final report.

40. The secretariat reminded GE.3 that the framework should be supplemented by case studies on performing stress tests. GE.3 invited experts to explore interest for case studies.

41. The secretariat explained then the delay in preparing the draft guidance for assessing transport asset criticality and the absence of Informal document (2023) No.6. GE.3 took note of this information.

42. The secretariat also presented Informal document (2023) No.7 which contains an initial analysis done by the secretariat on the data collected through the surveys on impacts of climate/weather related events on transport infrastructure (road and rail). GE.3 welcomed this initial analysis and its interesting, though indicative outcomes on the relation between intensities of precipitation/ranges of temperatures and impacts on rail and road infrastructure and operation in terms of length of disruption and costs. It acknowledged the difficulty of estimating the costs of damage due to climate events given that the damage can also depend on the local characteristics of the infrastructure. GE.3 requested to share this initial analysis together with a request to complete the survey by more infrastructure managers and railway undertakings. GE.3. also mentioned that, in addition to this survey, quantifying indirect costs due to climate events (for instance losses due to unpaid fees or socioeconomic losses due to additional travel time) would be interesting but also requires a local knowledge of the infrastructure and services it provides.

43. GE.3 also recommended to look at the outcomes from the perspective of KPIs used by transport entities for creation of business-case for adaptation.

VIII. Other business (agenda item 7)

44. Oxford Institute for Energy Studies briefed on its work and expressed willingness to present at the next session more detailed information on the interdependencies between energy and transport in the context of adaptation. GE.3 welcomed this proposal.

45. Global Alliance of Universities on Climate informed GE.3 about the objectives of the Alliance and about an upcoming cross-modal transport resilience event. GE.3 requested the Alliance to report about the outcomes of the event at its next session.

IX. Date and place of next meeting (agenda item 8)

46. The secretariat informed GE.3 that its next, twenty-sixth session was scheduled to take place in Geneva on 7 and 8 March 2024.

X. Summary of main decisions (agenda item 9)

47. The secretariat summarized the decisions taken by GE.3. The full report of the session, prepared by the secretariat in consultation with the Chair and Vice-Chairs, would be shared electronically after the session for adoption.