



Economic Commission for Europe
Inland Transport Committee
Working Party on Transport Trends and Economics
**Group of Experts on Climate Change Impacts and
 Adaptation for Transport Networks and Nodes**
Twelfth session

Geneva, 27 and 28 March 2017

**Report of the Group of Experts on Climate Change Impacts
 and Adaptation for Transport Networks and Nodes on its
 twelfth session**
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I. Attendance

1. The Group of Experts (hereafter called the Group) on Climate Change Impacts and Adaptation for Transport Networks and Nodes held its twelfth session on 27 and 28 March 2017. The session was chaired by Mr. J. Kleniewski (Poland).
2. Representatives of the following United Nations Economic Commission for Europe (UNECE) member States participated: Denmark, Finland, France, Germany, Iceland, Netherlands, Poland, Portugal, Romania, Slovenia, Spain and the former Yugoslav Republic of Macedonia.
3. Representatives of the following United Nations organizations or specialized agencies attended the meeting: United Nations Conference on Trade and Development (UNCTAD) and the World Meteorological Organization (WMO).
4. An expert from the following intergovernmental organization participated: International Sava River Basin Commission (Sava Commission). Experts of the European Union (EU) also attended. Experts from the following non-intergovernmental organization participated: International Road Federation.
5. At the invitation of the secretariat, experts from the following organizations participated: Climate Service Centre Germany and Institut Supérieur de Gestion, France.

II. Adoption of the agenda (agenda item 1)

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6. The Group adopted the agenda.

III. Climate Change and Transport Networks and Nodes: Presentations of initiatives at national and international levels (agenda item 2)

7. The representative from Spain, Mr. A. Compte, presented the progress made to date to identify which sections of the Spanish State-owned inland transport network are potentially more vulnerable taking into consideration climate change effects. The main methodological steps envisaged to follow during this exercise are:
 - (a) Classification of the sections of the inland transport network according to their criticality;
 - (b) Differentiation of different levels of exposure of the inland transport network to climate change;
 - (c) Consideration of different levels of sensitivity of the transport sections to climate change.
8. The representative from France, Mr. A. Leuxe, presented the interim report of the National climate change adaptation plan: transportation infrastructures and systems actions. This report provides detailed information on climate changes expected in France by 2100; the potential impacts on transport infrastructures; the technical documentation for the design, operation, and maintenance of transport infrastructures that could potentially be impacted by climate change; as well as climate projections that are necessary to adapt the reference documents. The expert also presented the methodology used in order to reply to the Group's questionnaire.

9. The representative from the Former Yugoslav Republic of Macedonia, Mr. M. Kopevski, presented the impacts of climate change to transport infrastructure of his country by illustrating a photo and video gallery. Floods of 2011 and 2016 resulted to devastated catastrophes mainly in the Capital Skopje. Three-and-a-half inches (93mm) of rain fell in Skopje in the storm - more than the average for the whole of month (August 2016). The water level reached as high as five feet (1.5 metres) in some of the affected areas.

10. The representative of the Sava Commission, Mr. D. Isakovic, presented the guidance note on inland navigation and adaptation to climate change in the Sava River Basin. The water and climate adaptation plan of the Sava river basin includes:

- (a) Analysis of historic climate trends;
- (b) Climate and hydrological modelling;
- (c) Main report + Guidance notes:
 - (i) Navigation;
 - (ii) Hydropower;
 - (iii) Agriculture;
 - (iv) Flood protection;
 - (v) Economic evaluation of CC impacts.

11. It was reported that the climate related restrictions of inland navigation are due to:

- (a) Low flows (hydrologic regime);
- (b) High flows (hydrologic regime);
- (c) River ice (hydrologic regime, water temperatures);
- (d) Visibility - fog (air humidity, air temperatures).

12. The Group welcomed the presentations made by the experts and requested the secretariat to include all these case studies and information at the final report of the Group. The presentations of the national experts can be found at the following link: www.unece.org/trans/main/wp5/wp5_ge3_12.html.

IV. Partners and expected contributions (agenda item 3)

13. The representative of WMO, Dr. B. Lee, delivered an overview presentation on information and services for weather, climate and disaster. She emphasized in her presentation on the importance of continuous attention to climate science and the latest development therein, under the rapidly changing climate; taking into account the various climate indicators (e.g. global temperature, sea level, precipitation anomalies) and emission pathways. The presentation also illustrated the significantly increasing economic losses by growing number of weather- and climate- related disasters, notwithstanding the notable improvement in weather forecasts. Dr. Lee noted that weather and climate information are critical both for immediate responses to short-lived extremes and for medium/long term planning for socioeconomic infrastructure, and highlighted the importance of employing reliable climate information (including the projections) based on solid scientific proof when it comes to the key decision making - such as the scenario-based regional downscaling coordinated by the World Climate Research Programme (WCRP) within WMO. She concluded her presentation by expressing Organization's willingness to work closely with the Group in order to ensure achievement of its objectives.

14. Following the presentation of WMO, Dr. P. Bowyer from the Climate Service Centre of Germany presented on behalf of the World Climate Research Programme (WCRP) the results of the Quantifying projected impacts under 2°C warming (IMPACT2C) project. IMPACT2C was a successful demonstration on the application of quantified climate projection from the detailed regional downscaling models, which has the objectives to provide information and evidence on the impacts of +2°C global warming to the various socioeconomic sectors of Europe. The research questions of the project were:

- (a) What are the potential climate impacts in Europe in a 2 degree (compared to pre-industrial) warmer world?
- (b) What are the differential impacts between 1.5, 2, and 3 degree C worlds?
- (c) Are there any hotspot areas in Europe which may be particularly negatively or positively affected by multiple climate impacts?

15. The +2°C global warming means for Europe that most regions warm more than global average; exceptions are British Isles, France, Germany and surrounding areas; most pronounced warming in the north and east in winter and in the south in summer; more precipitation in the north and more severe heavy precipitation extremes in most of Europe.

16. The experts of the Group recalled that the main objective of the Group is to identify and establish, if possible, inventories of transport networks in the ECE region which are vulnerable to climate change impacts, if possible in a geographic information system (GIS) environment. The experts should work in order to plot if possible on a GIS environment the critical transport infrastructure and the climatic factors projections in order to create a hot spots map for the ECE region.

17. It was agreed during previous sessions of the Group that the projections on different climatic factors should be requested by the relevant UN bodies such as the WMO, the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC) secretariat. The experts took advantage of WMO experts' presence and requested the following data:

- (a) The region that should be covered should be the ECE region, 56 countries;
- (b) Projections for temperatures, precipitation, winds, sea level rising, fog and floods extremes;

Precipitation	Extreme annual precipitation
	Intensity of extreme rainfall
	Duration of heavy rainfall
	Floods
	Droughts
	Flash floods in rivers
	Snow
Temperature	Extreme temperature
	Daily maximum temperature
	Frost days
	Heat waves

Wind	Intensity of extreme winds
	Frequency of strong winds
	Wind direction
Fog	Fog intensity
	Frequency of intense fog

Sea level rising

(c) Projections of these changes should be made available under 2 scenarios, RCP 4.5 and RCP 8.5;

(d) The time period should be relevant to timeline (planning, construction and operation life) of transport infrastructure therefore 2000-2030-2050;

(e) The number of the models of which the results will be used (mean) should be around 10;

(f) The G.I.S resolution should be 0,11 degrees;

(g) The critical transport infrastructure that will be plotted with those climatic factors projections will be the road and rail networks, inland waterways, airports, ports, logistics centres and intermodal terminals.

18. The experts requested WMO to consider this request and make everything possible in order to deliver this data well before the next meeting of the Group in June.

19. The representative from EU, Mr. A. Christodoulou, presented the results of the third phase of the project Projection of Economic impacts of climate change in Sectors of the European Union based on bottom-up Analysis (PESETA). The impacts considered during the third phase of the project were the sea level rise and extreme weather events affecting seaports, the sea level rise and extreme weather events affecting airports as well as floods and droughts affecting inland waterways. The JRC¹ PESETA III project implemented a three-stage approach similar to that of the JRC PESETA II project. In the first step, the climate simulations were selected, which are the primary climate data for all biophysical models. In the second step, the biophysical impact models were run to compute the biophysical impacts generated by each specific climate change simulation. In the third step, the biophysical and direct impacts were consistently valued in macro-economic terms through a multi-sector computable general equilibrium model. The project considered impacts on agriculture, energy, transport, river floods, coasts, droughts, habitat loss, forest fires, water, and human health.

20. The representative of UNCTAD, Mr. R. Lang, provided information on the UNCTAD capacity-building project on "Climate change impacts on coastal transport infrastructure in the Caribbean: Enhancing the adaptive capacity of Small Island Developing States". A case-study focusing on two vulnerable SIDS² in the Caribbean region (Jamaica and Saint Lucia) will be carried out to enhance the knowledge and understanding at the national level and to develop a methodology for assessing climate-related impacts and adaptation options in other SIDS.

¹ Joint Research Centre

² Small Island Developing States

21. The representatives of IRF, Ms. V. Menchikova and Ms. C. Willis, provided information on the IRF Manifesto on Climate Change Adaptation where thirteen recommendations towards support global action aiming at proactively combat the potential adverse impacts of climate change on transport have been elaborated. More information can be found at the following link: www.irfnet.ch/files-upload/newsletters/2016/mailing_09112016/IRF_Manifesto_Adaptation.pdf.

V. Discussions on the structure of the final report of the Group of Experts (agenda item 4)

22. The experts recalled the outline of their final report agreed during their first session and reviewed progress made on the different chapters. The secretariat informed the Group that the final updated version of chapter 1 on the overview of climate change projections in the ECE region will be ready for the meeting of the Group in June. This update will be based on information and data presented by WMO during the session.

23. The secretariat provided information on how the second chapter on the identification and sensitivity of transport infrastructure in the ECE region will be elaborated. The secretariat pointed out that since the information provided on the replies to the questionnaire on this topic was limited the information from the EC, the Trans European Transport Networks (TEN-T), the ECE EATL project and the work of ECE on road and rail censuses should be used. The E-road and E-rail Censuses provide comparable data on traffic flows on main European roads and railways. The E-roads table includes total length of E-Roads by width and number of carriageways and lanes, E-Road sections' average annual daily traffic (AADT), distribution of motor traffic by vehicle category etc. The characteristics of E-Railway lines provide information on volume and distribution of rail traffic, on the technical characteristics of the rail network (e.g. electrification) and on the stock situation at the end of reference year.

24. The secretariat mentioned that elaboration of Chapter three of the final report is mainly depending on data availability and delivery time from WMO. In general WMO during the session mentioned that some part of the data exists and could be delivered probably before the meeting of the Group in June. However, a final and detailed data request should be sent to WMO experts after the approval of twelfth session's report.

25. Regarding Chapter four of the final report the secretariat mentioned that UNFCCC secretariat representative provided the information that they are working on two to three cases studies and most probably they will be able to present them during the last session in June.

26. Furthermore, the secretariat provided information on the number of replies to the questionnaire. So far, twenty countries have replied to the questionnaire. Even though there are some other countries that have promised to reply, the secretariat informed the Group that will prepare an analysis of the so far received replies in order to present it during the session of the Group in June.

VI. Other business (agenda item 5)

27. There were no other items.

VII. Date and place of next meeting (agenda item 6)

28. The Group of Experts thirteenth session is tentatively scheduled to take place in Geneva on 22 and 23 June 2017.

VIII. Summary of main decisions (agenda item 7)

29. The Group adopted its main decisions of its twelfth session and requested the secretariat and the Chair to prepare the full and complete report for circulation to the members of the Group for comments on items other than those contained in its main decisions.
