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Use of ForFITS as part of IPCC's Assessment Report 6 and other activities

Note by the secretariat

I. 2020 ForFITS application for IPCC's Assessment Report 6

A. The IPPC AR6

1. The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. The IPCC provides regular assessments of the scientific basis of climate change, its impacts and future risks, and options for adaptation and mitigation.

2. The IPCC prepares comprehensive Assessment Reports (ARs) about knowledge on climate change, its causes, potential impacts and response options. The IPCC also produces Special Reports, which are an assessment on a specific issue and Methodology Reports, which provide practical guidelines for the preparation of greenhouse gas inventories.

3. For the ARs, IPCC scientists volunteer their time to assess the thousands of scientific papers published each year to provide a comprehensive summary of what is known about the drivers of climate change, its impacts and future risks, and how adaptation and mitigation can reduce those risks.

4. To date; five assessment reports have been prepared and published. Assessment reports have typically a five to six-year cycle with the first AR published in 1990. The sixth AR (AR6) is expected to be released over the course of 2021/2022, now being composed of four reports which launch dates expected as follow:

(a) April 2021: The Physical Science Basis (Working Group I)

(b) July 2021: Mitigation of Climate Change (Working Group III)

(c) October 2021: Impacts, Adaptation and Vulnerability (Working Group II)

(d) June 2022: AR6 Synthesis Report: Climate Change 2022

5. IPCC's role is to assess literature relevant to climate change and as such does not develop its own scenarios. It is therefore reliant on the modelling communities to make the results of their scenario-building efforts available in a structured and readily accessible form.

6. Working Group III, working on mitigation of climate change had built up a database for the fifth AR and launched a call for scenarios as part of various chapters for the Mitigation of Climate Change publication, with Chapter 10 dealing with transport and mobility. The database is being established for the sole purpose of informing the AR6 and hosted by the International Institute for Applied Systems Analysis (IIASA).

B. ForFITS as a registered model for IPCC

7. To be able to submit data to be considered y lead authors of WG III, Chapter 10 on transportation, model had to be registered by filling a detailed questionnaire on the model functionalities, scope, time horizon, etc…

8. More than forty fields were required to assess the model specification, transparency, key modelling approaches. Regional specification and aggregation are also of key importance as AR6 is looking at global modelling results.

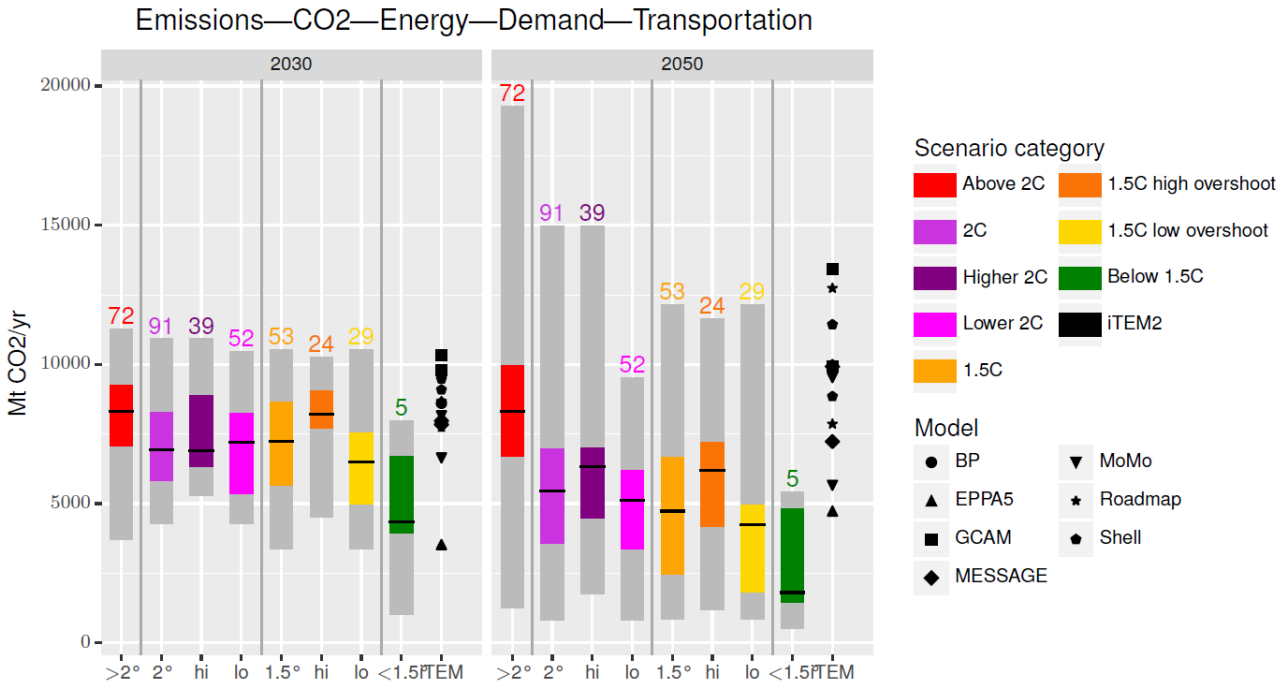
9. After submitting all the required information for registered model, the ForFITS model had been registered successfully for AR6 data submission as it met all the criteria set by the IPCC to feed the database of scenarios results.

10. IPCC AR6 is looking at models that have done global scenario analysis in order to compile results into a single database and compare results at the international and global level, with a time horizon to at least 2030.

11. Similar activities on inter-modal comparisons have already been done by the The International Transport and Energy Models (iTEM) as part of their model intercomparison projects (MIPs). The spread of results between models provide an indication about model discrepancies looking into the future (Figure 1).

12. Uniform scenario categorization is crucial to be able to compare modelling results and better characterize model outputs. Uniform input scenario modelling is planned by iTEM in order to have a better modelling approached comparison.

Figure 1
Model intercomparison for CO_2 emissions, 2030 and 2050



Source: iTEM, 2018

13. MIPs are looking at transport activity, energy use and CO2 emissions as the main inputs and outputs of the models considered in the comparison, et the 2030 and 2050 time horizon.

C. ForFITS data submitted for consideration

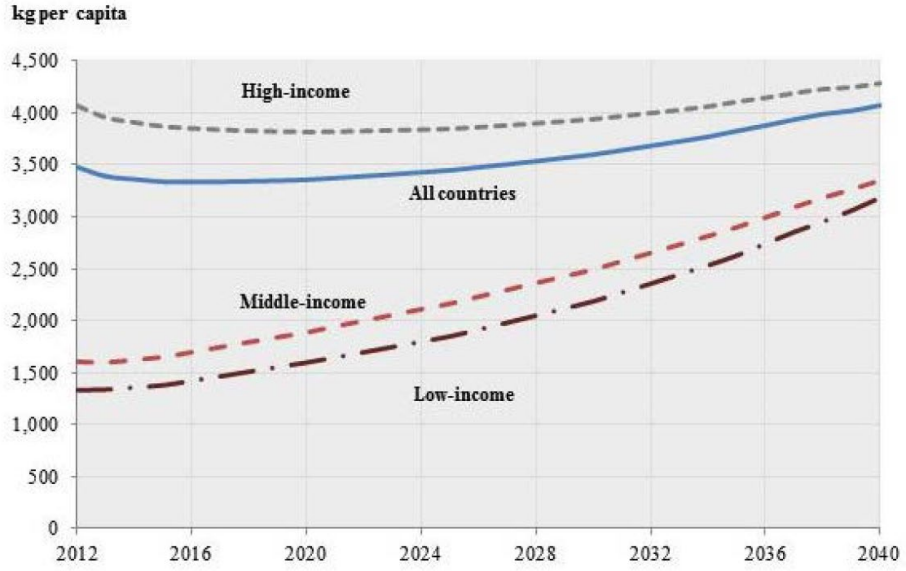
14. The ForFITS main applications have been at the national or urban level, with several applications done in ECE countries as part of the Environment Performance Reviews (EPRs) and THEPEP for urban modelling.

15. At the 78th session of ITC, results of a study made for all ECE countries have been presented (ITC Document No. 13). Such results represent the only case where ForFITS has been used for multinational scenario analysis, performed at the secretariat level.

16. The projection up until 2040 for ECE member States were done for a baseline scenario using specific national values when available or ForFITS default values for countries where no sufficient input data were available (Figure 2).

Figure 2 (UNECE, 2016)

Well-to-wheel CO_2 emissions per capita from inland transport, by income level, in selected UNECE member States: 2012–2040



Note: Vessels and aircraft not included. Well-to-wheel = CO_2 emissions from both vehicle operation and emissions from production and distribution of fuel used operation. See report for definitions of regions.

Source: UNECE, 2016

17. Lead authors of the transport chapter of AR6 will assess the relevance and utility of the data submitted to be used as a basis for the AR6 data analysis. Given the lack of long term projections to 2050 and the non-coverage of all region globally, the data might not be suitable to its full extent.

18. The secretariat felt it was important to contribute to the IPCC effort to use all data available to perform an exhaustive analysis of all the transport and energy modelling data to the maximum extent possible, by getting as much data as possible to inform the report and its readers and to help UNFCCC take informed decisions.

19. Detailed modelling in countries and regions in Eastern Europe is not often performed to the level of details offered by ForFITS and could help better refine scenarios analysis and forward-looking projections in those countries to IPCC has limited information and data.

20. For future Ars, compiling the ForFITS data from the various EPRs performed could also be a way to improve and actualize the projections for East European and West Asian countries.

II. Further activities at ECE

A. Upcoming EPR for Azerbaijan

21. Activities had started in the course of 2020 to start a ForFITS analysis as part of a forthcoming EPR for Azerbaijan. The initial data collection effort underway had to stopped due to the local situation in the country. Coordination activities were held with the International Transport Forum who has also started activities in the country as part of their Decarbonizing Transport Initiative.

B. Collaborate with the Energy division on their new carbon neutrality project

22. At the end of 2019, the Sustainable Energy division of UNECE has completed a project on energy pathways to model carbon mitigation potential for the power and carbon intensive industries.

23. A modelling framework has been developed as part of this project and a follow-up project has been launched on " Enhancing understanding of the implications and opportunities of moving to carbon neutrality in the UNECE region across the power and energy intensive industries by 2050". A cross sectorial collaboration towards carbon neutrality will be considered as part of the forthcoming activities of this project expected to end in May 2022.

24. Discussions will be held in the course of 2021 to assess the contribution of the expertise developed during the ForFITS development could bring to this project.

III. Partnership with other transport, energy and environment modelling initiatives

A. Participation to ADB's Asian Transport Outlook

25. The Asian Development Bank has started a process to regularly publish an Asian Transport Outlook. The secretariat has been consulted to give advice on the best way forward and on data availability given the overlap between ECE and ADB country membership. Further consultation are expected to take place as the project develops.

B. Developing a formal agreement with the International Energy Agency on research partnership on transport and energy modelling

26. The International Energy Agency (IEA), an intergovernmental body founded in 1974, is at the heart of global dialogue on energy, providing authoritative analysis through a wide range of publications, including the flagship World Energy Outlook and the IEA Market Reports; data and statistics such as Key World Energy Statistics and the Monthly Oil Data Service; and a series of training and capacity building workshops. One of the key products developed for the transport sector is the IEA Mobility Model (MoMo), the centrepiece of a partnership of 23 organizations sharing knowledge and expertise on transport and energy modelling. Currently, there is an annual fee to become a MoMo member and gain access to data and analyses developed by the IEA transport team.

27. UNECE has been invited to join the IEA's Mobility Model (MoMo) as a research partner. The IEA MoMo team has recently agreed to offer selected partners the opportunity to join the MoMo partnership free of charge provided they participate in the development of the tool through their expertise and knowledge.

28. Discussions are continuing between both parties to find common terms and conditions to make such agreement between both institution a reality. COVID crisis has delayed a decision until further notice.