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**Strategic questions of a horizontal policy nature: Environment, climate change and transport -
Decarbonisation and mitigation of environmentally harmful effects of inland transport**

Use and further development of the For Future Inland Transport Systems (ForFITS) tool

Note by the secretariat

I. 2018 ForFITS developments

1. The 2016-2018 workplan presented at the 79th session of ITC (ECE/TRANS/2017/7) requested extra budgetary funds to increase the capabilities of ForFITS and improve its visibility and use. No funds have been identified thus far and, consequently, the development work of ForFITS has been done internally with the limited resources available within the Sustainable Transport Division.

2. Close collaboration with other transport and energy modelling groups have also been initiated to facilitate cross-cutting modelling efforts and to promote collaborative analysis in the near future.

A. Internal developments

1. Development of a data visualization interface

3. ForFITS is run by Vensim software that allows for continuous simulation or system dynamics. Even though the modelling interface is visual, the software has outdated data visualization capabilities. ForFITS input and output are all in Excel with limited interactivity and standardised visuals.

4. To improve the visibility of ForFITS, initial work has started on selecting a framework for interactive data visualization of ForFITS results. An assessment of the data visualization tools available has been performed, and a short list of candidate software selected for further evaluations.

5. The following tools could potentially offer visualization capacity that would fit ForFITS' needs: Microsoft Power BI, Tableau Public, Google Charts, R Shiny (as used in SafeFITS), Qlik Sense, Sisense. Initial assessments on the tools licensing, IT knowledge requirements, stability and availability to UN staff have shortened this list to several potential tools.

6. Specifically, Tableau, Qlik Sense and Microsoft Power BI appear to be the most relevant tools to interactively show data from ForFITS. A deeper analysis will be undertaken to assess which of these is the best tool to highlight ForFITS analysis.

7. These further assessments of the short list of data visualization tools will be performed in 2019. The main elements to be considered include ease of use, easy access to training material and communities of knowledgeable users, the possibility to embed the visuals in independent, third party webpages (for example on UNECE website, and/or a dedicated ForFITS website), the cost of licensing and the experience of the UN Secretariat in using the tool.

8. A set of interactive visuals have been prepared from the ECE study that has been done using ForFITS (Informal document ITC (2016) No. 13) to evaluate the practicalities of the different software and how ForFITS data can be displayed interactively, as shown in Figure 1. More examples and detailed explanations are available upon request.

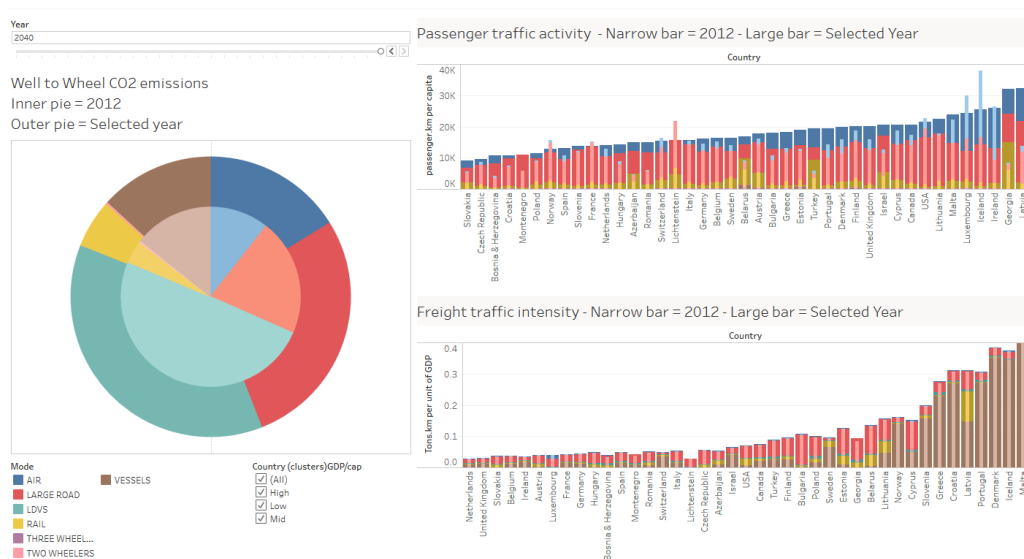


Figure 1: visual example for CO₂ emission by country and mode

9. Better data visualization capabilities of ForFITS are likely to increase the visibility of the tool to policy makers, and to improve its attractiveness. Increased interest in the tool could both highlight the utility of the tool and clarify which areas could be further enhanced through new development funding.

2. Inclusion of local pollutants into ForFITS

10. Air quality, especially in cities, is an important issue where the transport sector plays a significant role. The inclusion of local pollutants into ForFITS requires not only an update of the structure of ForFITS but also a robust database of emission factors for each pollutant to be considered and for each vehicle types available in the model.

11. Default data are a key component of ForFITS for users who have limited access to mobility data in their respective countries. Providing a centralized, transparent platform

where harmonized emission factors from road transport would add significant value to the model for stakeholders, as such data is usually used in scattered and inconsistent ways by institutions performing emission inventories, projections or impact assessments.

12. Upgrading the model to include local pollutants would require further assessment and would be subjected to new funding. Indeed, a substantial addition to the model's input and modelling framework would be needed to accommodate emission standards into the vehicle classes. Such distinctions are not necessary with the existing version of ForFITS focusing on energy and CO₂ emissions.

B. Synergies with other modelling initiatives

1. Joining the iTEM network

13. The International Transport and Energy Models (iTEM) partnership aims at enhancing exchange and collaboration between transport and energy modellers around the world. More than ten research institutions, international governmental and non-governmental organizations gather once a year to discuss in-depth modelling issues and regularly perform inter-model comparison exercises to find out the consistency of results with harmonized sets of data inputs.

14. ForFITS has become a member of iTEM in 2018. The membership is free of charge and all members provide modelling results and/or datasets as a requirement for membership. Such membership is expected to bring insights about the latest trends in modelling approaches and to offer a stimulating platform for future ForFITS use and evolutions.

15. In 2019, ForFITS model runs might be included in the inter-model comparison exercise. Inter-model comparisons highlight the differences in modelling results with similar inputs, and trigger discussions on the modelling approaches used within each model. The aim is not necessarily to harmonize modelling results, but to be able to explain such differences in modelling results when they occur.

2. Development of a worldwide harmonized emission factor database for road transport

16. During the summer of 2018, discussions started between the UNECE secretariat and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on developing a worldwide harmonized emission factor database for road transport. The project, still at a conceptual phase, aims at providing a centralized data platform where emission factors would be provided for individual countries, based on key elements of their vehicle fleets.

17. Emission factors are used widely to convert traffic activity and /or energy use into emissions. Impact assessments, emission inventories, Intended Nationally Determined Contributions (INDCs) and many other types of transport and mobility studies and analysis rely on robust and realistic emissions factors.

18. Robust emission factors require in-depth knowledge of the composition of the vehicle fleet and the traffic conditions for the area considered, usually at the country or city levels. Developing countries often use values from developed countries, due to lack of resources, leading to inconsistent results.

19. The project initiated by GIZ would provide tailor-made emission factors for a growing number of developing countries, developed using a standard methodology and published on a single harmonized platform. External institutions would then be able to use the data publicly available, through a database or Application Programming Interface (API) from which other website could access emission factors for their own purposes.

II. Future plans for ForFITS

A. ForFITS in Uzbekistan

20. The UNECE Environment Division has initiated the Environment Performance Review for Uzbekistan, which will be released in 2019. Mission in the field with UNECE expert will occur in the first quarter of 2019, attended by Francesco Dionori for the Sustainable Transport Division.

21. A ForFITS application for the EPR of Uzbekistan has also been requested pending funds availability to collect the necessary data to run the model. Alternative scenarios are also being envisaged, according to the requirements of the local partners and the policy packages they would want to assess.

B. Second hand vehicles flows

22. Following the conference jointly held by UNECE/ITC and UNEP on "Ensuring Better Air Quality and Reduced Climate Emissions through Cleaner Used Vehicles" in conjunction with the seventy ninth session of ITC, UNEP and UNECE have decided to further collaborate on the issue of used vehicles.

23. ForFITS applications in developing countries, for example through Environment Performance Reviews, require an in-depth understanding of the vehicle fleet in the considered countries. For more accurate results, fleets need to be disaggregated by vehicle size, fuel type and vehicle age categories. The import and export of used vehicles in a country is a key parameter to characterize the vehicle fleet.

24. International datasets on the export/import of used vehicles, and the policies to better manage cross-border used vehicles flow are sparse, often outdated and lack harmonization. The ForFITS team and the Sustainable Transport Division of UNECE is considering possible new activities in the field of second hand vehicle trade flows and policy recommendations to ensure good environmental and safety performance of exported and imported used vehicles.

C. Fundraising as part of external projects

25. The potential involvement of UNECE in the development of a worldwide harmonized emission factor database for road transport (para. 16) is an opportunity for external funding opportunities if the ForFITS team is to act as a coordinator for the project. As the project develops, a partnership between international and local stakeholders would be built to exponentially increase the number of countries covered in a centralized database. The coordinator task that could be held by UNECE would benefit from high visibility, and users would value the neutrality and objectivity as core values to UNECE's involvement.

26. The nascent work on second hand vehicles flows would also potentially benefit from internal or external extra-budgetary funding. The issue of second hand vehicles exports and imports is addressing both environmental and safety issues, with the possible implication of other UN regional commissions, open wide funding opportunities to be explored in 2019.
