

Item 7 (e) of the provisional agenda
Implementing the Paris Declaration

For Future Inland Transport Systems (ForFITS): A new tool for the implementation of the Paris Declaration

Concept note prepared by the secretariat

Summary

This document introduces a new tool that could prove useful in the implementation of the Paris Declaration, especially clauses 14 and 15.

ForFITS is a tool developed by UNECE to evaluate transport activity, energy use, and CO₂ emissions in a range of possible policy contexts. Sustainable transport can be assessed in ForFITS by creating simulations of policy choices which take into account the expected evolution of relevant macroeconomic parameters. Fuel taxation schemes, subsidies for cleaner vehicle technologies, road pricing, modal shift assessment, structural changes in the transport system and introduction of sustainable biofuels are only some of the policy options that are addressed by ForFITS. The tool allows users to easily visualize and compare the results of multiple runs of the model.

The first application of ForFITS in the context of THE PEP coincided with the first THE PEP relay and workshop following the Paris declaration that took place in Kaunas, Lithuania in September 2014.

I. The Paris Declaration and The ForFITS tool

1. During the Fourth High-level Meeting on Transport, Health and Environment that was held from 14 to 16 April 2014 in Paris, hosted by the Government of France and under the auspices of the Transport, Health and Environment Pan-European Programme (THE PEP), member States adopted the Paris Declaration that lays out their vision for the achievement of sustainable and healthy urban transport and mobility.
2. The Paris Declaration, recognizing the importance of the expected increase in extreme weather events in some regions, as described by the International Panel on Climate

Change, expressed its readiness to promote transport strategies and policies that reduce fuel consumption and emissions of air pollutants, while addressing climate change. It did so aware of the importance of stimulating innovation and action at the local levels through supportive international and national policies. These directions are reflected in clauses 14 and 15 of the Paris Declaration, where Member States:

14. Undertake to provide national support to subnational and local action as well as to the development of new and stronger partnerships with city networks, civil society organizations and the research community;

15. Support national and international efforts towards addressing climate change while reducing emissions of air pollutants from the transport sector;

3. It is in this context that the For Future Inland Transport Systems (ForFITS) tool has emerged as a tool to help fulfil THE PEP vision. ForFITS was developed by UNECE in the framework of a United Nations Development Account (UNDA) project that involved all United Nations Regional Commissions.

4. ForFITS provides a robust and transparent framework, capable of analysing strategies that foster the development of sustainable transport at the local and national levels and linking these strategies with policy-making decisions. Thus, ForFITS assists policy makers in making informed decisions about measures for the reduction of CO₂ emissions generated by the transport sector.

5. To do so, ForFITS translates the implementation of transport policy options into projections of possible future effects on transport activity, energy use and ultimately CO₂ emissions given the expected evolution of relevant macroeconomic parameters. Fuel taxation schemes, subsidies for cleaner vehicle technologies, road pricing, modal shift assessment, structural changes in the transport system and introduction of sustainable biofuels are examples of policy options that can be addressed by ForFITS. The tool allows users to visualize and compare the results of multiple runs of the model.

6. Information on transport activity, vehicle and fuel characteristics, as well as fuel usage has a fundamental importance when evaluating past, present and future levels of CO₂ emissions. Notably, a wide range of inputs (including demographic and macroeconomic statistics, technological characteristics of vehicles and costs) is needed for the evaluation of CO₂ emission mitigation policies in transport. Such data should not only characterize the past and current timeframes, but also the future in some cases in order to properly evaluate the probable outcomes of policy measures.

II. Case study: ForFITS and the city of Kaunas

7. The ForFITS tool was applied for the first time within THE PEP framework at the local (Kaunas) and national (Lithuania) levels as part of the 2014 annual THE PEP Workshop (relay race) that was organized by the Kaunas City Municipality in cooperation with the Ministry of Health, Ministry of Transport and Communications and Ministry of Environment of Lithuania and THE PEP Secretariat. The Workshop itself was the first implementation activity of the Paris Declaration.

8. Select aspects of the final report that are discussed below provide estimations of the changes in projections of transport sector CO₂ emissions compared to the baseline scenario under three alternative scenarios: (1) where a shift towards a more dense and highly integrated public transport network is implemented, (2) where attitude changes in the public result in more environmentally friendly transportation choices and (3) where oil prices double by 2030. A brief conclusion section will follow where these results are analysed and discussed in terms of possible future directions for Kaunas.

9. The full report (*forthcoming*) provides a general description of the ForFITS model and an overview of the current transportation status of Kaunas today in terms of road infrastructure and public transport infrastructure as well as clarifying geographical and socio-economic realities (not reflected in this note).

CHANGES IN KAUNAS POLICY

10. In 2010 the Kaunas city council approved an air quality management program for 2011-2014. This program recognizes that the transportation sector generates a substantial proportion of the pollution in city of Kaunas. For example, maximum nitrogen oxide and nitrogen dioxide pollution levels in Kaunas coincide with morning and evening peak traffic flows. This suggests that motor vehicles are the main urban air polluter, accounting for 80 per cent of all pollution. (Source: Kaunas municipality's 2014-2016 Strategic Action Plan).

11. Urban environmental quality is also noted in the Kaunas City Strategic Plan for 2008-2015 action plan as priority 3. The plan envisions a reduction of CO₂ emissions and improving overall air quality by implementing several transport-related policies.

12. The planned measures aim at reducing air pollution by developing environmentally friendly public transport. Public transport will be enhanced by expanding the trolleybus network as well as acquiring new environmentally friendly buses and trolleybuses and developing additional bicycle paths. Specifically the following measures will be implemented:

- Electric power supply and catenary trolley modernization between 2008 and 2015.

- Trolley bus network development - in the period 2008-2014 construct a new trolleybus catenary.
- Low-polluting vehicles: buses and trolleybuses acquisition - acquire 50 new buses and 50 new trolley buses by 2014.
- Urban development of bicycle paths - install 20-25 km of cycle paths between 2011 and 2014.

ALTERNATIVE SCENARIOS BASED ON FUTURE POLICIES

13. To quantify the effect of future urban policies in Kaunas, ForFITS was used for projections of transportation activity and CO₂ emissions. The following three alternative scenarios were analysed:

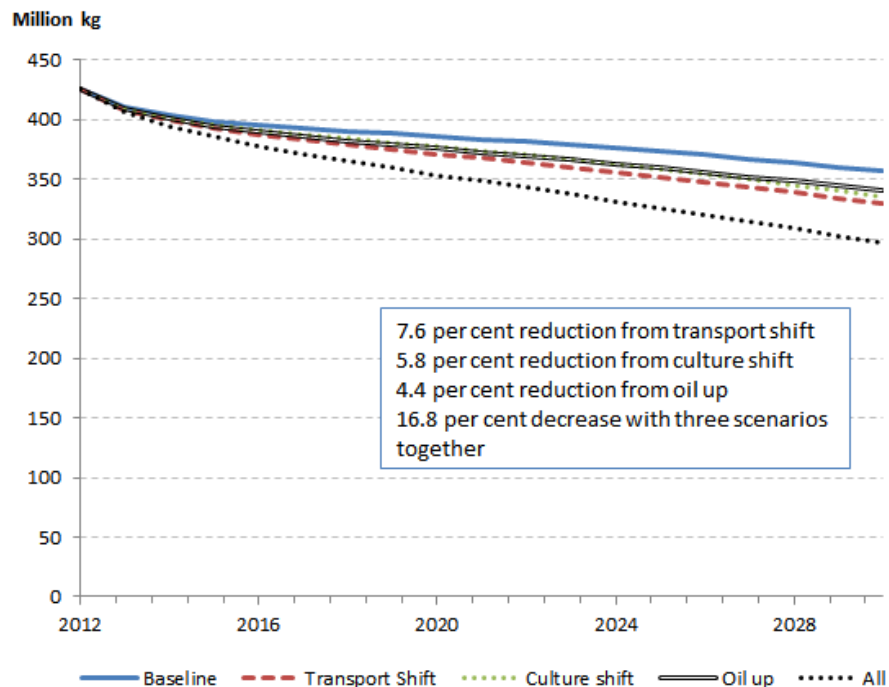
- Transport shift – The development of the trolley bus network in Kaunas and its acquisition of additional buses and trolleybuses could contribute to a transport shift in modes of transportation in the future. This scenario projects that Kaunas city further develops its public transport infrastructure in a way which results in an urban network that is 20 per cent closer in density (both in terms of population and infrastructure) to the most highly integrated cities in the world by 2030.
- Culture shift – Policies such as the development and promotion of bicycle paths in Kaunas, the bicycle parades, the campaigns with several events and the participation to different project such as the "SMOOTH" project could contribute to such a change in culture. Related to the transport shift scenario, this scenario projects that residents of the city will develop a "greener" attitude and those alternative modes of transportation such as walking and bicycling will be used to a greater extent and longer trips will also be avoided.
- Oil up – The final scenario projects that oil prices will double in real terms by 2030. This scenario is included despite recent drops in oil price to show also the indirect effect of prices on emission levels.

14. In addition to these three scenarios, one additional scenario projects the joint effect of all alternative scenarios. It is not unlikely that all alternative scenarios could jointly occur over the next two decades.

ALTERNATIVE SCENARIO PROJECTIONS

15. Figure 1 shows projected CO₂ emissions from the passenger transport sector under the baseline scenario, the three alternative scenarios and a combination of the alternative scenarios. Each scenario is projected to result in a reduction of emissions with the transport shift scenario projected to result in the largest decrease by 2030 compared to the baseline scenario (7.6 per cent). The same comparison shows a decrease of 16.8 per cent in 2030 compared to the baseline scenario when all three alternative scenarios are taken parallel.

Figure 1 Kaunas City wheel-to-well (WtW) CO₂ emissions from passenger transport Under Different Scenarios



III. Conclusion

16. Future emissions levels are projected to depend most strongly on population and GDP changes, but policy decisions are clearly relevant as well. Kaunas is taking positive steps toward reducing climate impact, but faces obstacles in the recent shifts in the transportation preferences of its residents toward those of a city characterized by urban sprawl. Infrastructure for public transportation appears to be an area of particular importance given the room for improvement shown in recent surveys of resident satisfaction with the current system.

17. Using the ForFITS tool, the potential impact of reversing the trend toward urban sprawl through improved public transport infrastructure and programmes to raise awareness of climate change issues can be observed. Since these are areas that can be influenced by public policy, ForFITS can help to show the potential impact of these types of measures and thus enable their continued or even expanded implementation.

18. More generally, the Kaunas study illustrates the potential uses of the ForFITS tool within the context of THE PEP in the implementation of the Paris Declaration. The ForFITS model is able to provide a robust and transparent framework to evaluate the potential impact of certain policies in reducing CO₂ emissions before these policies are implemented at city/local or national level.

19. Such types of policies for urban passenger transport could include congestion charges, traffic guidance systems, solutions related to Intelligent Transport Systems (ITS), travel and access restrictions for specific vehicle categories, parking policies (including charges and restrictions), the integration of transport in spatial and land-use planning (e.g. to promote transit-oriented urban development), infrastructure measures for the development of transport networks (e.g. for public transport, including ITS), solutions improving the urban environment to make non-motorized modes of transport such as walking and cycling more attractive, as well as the improvement or restructuring of the urban public transport regulatory framework.

20. Thus ForFITS can make a solid contribution to the implementation of the Paris Declaration and actively contribute to addressing climate change and promoting sustainable transport at the local, national and international level, as enshrined in clauses 14 and 15 of the Paris Declaration.