



United Nations Economic Commission for Europe

Final Report

**“Evaluation of the UNECE ITC support to governments in climate change mitigation:
lessons from the use of ForFITS tool that links policy choices and CO₂ emission
scenarios for inland transport”**

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Table of contents

LIST OF ACRONYMS	3
EXECUTIVE SUMMARY	4
INTRODUCTION.....	6
1.1. Purpose	6
1.2. Scope	6
1.2. Methodology.....	6
FINDINGS	8
2.1. Background	8
2.2. Project Objectives	9
REVIEW FINDINGS	10
3.1. Relevance	10
3.2. Effectiveness	14
3.3. Efficiency.....	18
3.4. Sustainability	19
3.5. Impact.....	24
3.6. A Note on Gender Considerations	25
CONCLUSIONS AND RECOMMENDATIONS	26
4.1. Conclusions.....	26
4.2. Recommendations	28
ANNEXES	33
6.1. References.....	33
6.2. Terms of Reference for the Evaluation	36
6.3. Evaluation Questions in Relation to the Desk Review and Surveys/Interviews	40
6.4. Documents Reviewed for the Inception Report	41
6.5. List of Persons Targeted for the Survey	43
6.6. Survey Questionnaires.....	44
6.7. Survey Responses	64
6.8. Information about the Reviewed Documents.....	77
6.9. Information about the NDCs of the UNECE Contracting Parties	85

LIST OF ACRONYMS

Acronym	Definition
ADB	Asian Development Bank
BAQ	Better Air Quality Conference
CO ₂	Carbon dioxide
COP	Conference of Parties
EC	European Commission
EPR	Environmental performance review
ForFITS	For Future Inland Transport Systems
GCF	Green Climate Fund
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
HEAT Tool	Health Economic Assessment Tool
HEV	Hybrid electric vehicles
HGV	Heavy goods vehicles
ICE	Internal combustion engine
ITF	International Transport Forum
LDV	Light duty vehicles
LPG	Liquefied petroleum gas
MooC	Massive open online course
NDC	Nationally Determined Contributions
SDGs	Sustainable Development Goals
THE PEP	Transport, Health and Environment Pan-European Programme
ToR	Terms of reference
TTW	Tank-to-wheel
UN	United Nations
UNDA	United Nations Development Agency
UNECE	United Nations Economic Commission for Europe
UNECE/ITC	United Nations Economic Commission for Europe Inland Transport Committee
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCWA	United Nations Economic and Social Commission for Western Asia
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization
WTT	Well-to-tank
WTW	Well-to-wheel

EXECUTIVE SUMMARY

This report summarizes the findings, conclusions and recommendations of the “Evaluation of the UNECE ITC (United Nations Economic Commission for Europe Inland Transport Committee) support to governments in climate change mitigation: lessons from the use of ForFITS tool that links policy choices and CO₂ emission scenarios for inland transport.” The evaluation focuses on the review of the support of the UNECE ITC to its Member States, particularly through the ForFITS (For Future Inland Transport Systems) Tool.

The UNECE, in cooperation with the other UN Regional Commissions launched the ForFITS project in 2011 in order to develop and implement a tool for assessing CO₂ emissions from inland transport. The said first phase of the project was funded by the United Nations Development Account (UNDA) and aimed at enhancing international cooperation and planning toward sustainable transport policies with the goal of facilitating climate change mitigation (UNECE, 2015). The first phase of the project concluded in 2013 and involved the development of the tool, the development of case studies, and the conduct of in-person capacity building activities.

This evaluation aims to assess the relevance, effectiveness, efficiency, sustainability, and impacts of the activities that were conducted during the second phase of ForFITS – 2014 to 2018.

Main Findings

Relevance

Rating: Satisfactory

ForFITS, as a tool, is in line with UNECE's overall goal of facilitating greater integration and cooperation and promoting sustainable development. ForFITS has been relevant to the implementation of activities under cluster 8 of the UNECE Transport subprogramme: Transport, Health and Environment Pan-European Programme (THE PEP). ForFITS is strategically relevant in supporting the overall UN goal of addressing climate change, as well as in supporting several sustainable development goals (SDGs). While the analytical work that has been conducted by UNECE using ForFITS has been relevant to the UNECE mandate as expressed in the Programs of Work of the Transport subprogramme, the lack of other activities – due to the lack of available resources - that would promote the use of the tool through capacity building and further development of the tool may have diminished the current relevance of the tool.

Effectiveness

Rating: Partially Satisfactory

The conduct of the UNECE analytical work has produced quality technical reports that aim at guiding policies for reducing carbon emissions in the beneficiary countries. However, the assessment also highlights the inability of the current tool and the available user guides to attract more users due to the relative complexity in the usage of the tool, coupled with heavy data requirements.

While the UNECE activities (e.g. analytical work and report development) have produced the intended accomplishments in terms of assisting in providing environmental assessments of the countries' transport sector, the activities during the evaluation period have been limited in terms of effectively building the capacities in the UNECE contracting parties in terms assessing the environmental performance of their transport sector using ForFITS, as the intended roll-out has not been fully achieved due to the lack of resources.

Efficiency

Rating: Satisfactory

Evidence suggests that the UNECE staff provided sufficient and timely support for those external users that have asked for technical guidance in the use of the tool. However, it must also be noted that the relevant interviews point towards the fact that current manpower in supporting ForFITS is limited.

Sustainability

Rating: Partially Satisfactory

The intended uptake of the tool, as well as the planned revisions to the tool itself have not been achieved, primarily hindered by the lack of available resources. In terms of the usage of the results of the tool, the results of the ForFITS applications have been used in policy discussions and have led towards the approval of policies such as those evidenced in Lebanon, and in Grand Lyon, France. Aside from these, there have been no evidence of sustained use of the tool within the beneficiary countries.

Impact

Rating: Partially Satisfactory

The results of ForFITS applications have supported the recommendations to government in policy dialogues, but limited evidence is available in terms of specific policies that have resulted from its applications. The tool was also essential in moving towards having a separate transport chapter in the UNECE environmental performance reviews (EPRs) and thus providing much needed analyses for sector- specific policy discussions. On the other hand, there seem to be no evidence of applications by other organizations/entities aside from those that have been mentioned in this report, thus suggesting limited impacts of the tool.

A Note on Gender Issues

The review finds that gender has not been mainstreamed in the project. However, it is noted that there were only limited opportunities for mainstreaming such as the activities conducted by UNECE were primarily related to modelling using the tool.

Main Recommendations

The following recommendations are given based on the evaluation:

1. Revisit the desired roles of ForFITS within the purview of UNECE and define its targeted users
2. Develop targeted "ForFITS activities" according to allocated resources for a more sustainable ForFITS programme
3. Improve the human and financial resources allocation and provide adequate support
4. Adopt a new programming environment for the ForFITS model
5. Offer mode-specific or intervention-specific modules in the ForFITS model
6. Develop a more user-friendly interface for the ForFITS model
7. Integrate co-benefits into the ForFITS model
8. Review and update the modelling relationships in the ForFITS model
9. Develop an online platform for engaging the community of ForFITS users
10. Develop an on-line training course
11. Ensure that gender balance is considered in the planning, implementation, and monitoring of activities relating to ForFITS
12. Increase UNECE's participation to key international fora on transport emissions/energy modelling

INTRODUCTION

1.1. Purpose

1. This evaluation focuses on the review of the support of the United Nations Economic Commission for Europe Inland Transport Committee (UNECE ITC) to its Member States, particularly through the For Future Inland Transport Systems (ForFITS) tool.
2. The evaluation results aim to contribute towards the provision of a long-term vision towards further developing the tool and strengthening its impact on policy recommendations, adoption and evaluation by the beneficiaries.

1.2. Scope

3. This evaluation focuses on the ForFITS-related activities that have been conducted between the period 2014-2018 (hereinafter “second phase of ForFITS”). It will particularly focus on how the ForFITS model has been utilized by internal and external stakeholders, and how it may have contributed towards the reduction of GHG emissions. This evaluation investigates the relevance, effectiveness, efficiency, sustainability, and impacts of ForFITS.
4. The evaluation also unpacks specific suggestions regarding the potential priority improvements for the tool, as well as suggestions for complementary activities that may assist in the maximization of the asset that is ForFITS.
5. While outside of the scope of the project, relevant developments in terms of transport emissions modelling, as well as factors that represent the demand for such models (e.g. global policy landscape developments, potential synergies with other initiatives) were also investigated, whenever appropriate, to feed into the development of recommendations.
6. This evaluation considered gender responsiveness and gender equality in the delivery of the tasks, and in the provision of findings and recommendations whenever appropriate. The evaluation uses non-discriminatory language and makes gender visible when it is relevant for communication and will not make gender visible when it is not relevant for communication (UN, n.d.).

1.2. Methodology

7. The evaluation involves the following data collection methods: document review, electronic surveys, and selected interviews.

Document Review

8. The document review considered the relevant UNECE materials that have resulted from the implementation of the ForFITS project (e.g. capacity building materials used in the first phase, background documents, technical reports), including those that were provided by the UNECE directly to the evaluator (See 6.4). While materials from the first phase are included, these were primarily used in supplementing the evaluation of the second phase of the project. Gender balance was also taken into consideration in reviewing pertinent documents.

Electronic Surveys and Selected Interviews

9. A search for external publications that have been developed using the ForFITS model was also conducted in order to get supplementary information about the users, and usage of the ForFITS model. Searches were done, primarily using the term “ForFITS” in Google Scholar, as well as in Elsevier.com to check whether there were publications that were released during the 2014-2018 period. This process also fed into the identification of respondents for the surveys and interviews.

10. The evaluation involves the gathering of views and insights from the following groups of respondents through electronic surveys, as well as selected phone interviews: external users; UNECE users; international experts (modellers); internal UNECE users (including former project managers).
11. The external users pertain to those who have used ForFITS in conducting energy and GHG (greenhouse gas) assessment studies in their respective countries/cities. These may include those who have been involved in the first phase of the project, as well as those who have come to know about ForFITS through other means. The questions for the external users focus on their own application of ForFITS.
12. The modellers (or international experts) that are involved in transport energy and emissions modelling and are familiar with, but do not necessarily have a deep knowledge of, the ForFITS model. The evaluation will take into consideration their insights on how ForFITS fares in relation to the other models, and where it may fit within the spectrum of models, considering the developments in the wider transport sector and the relevant policy contexts.
13. The internal UNECE staff include those who have been involved in the application of ForFITS (e.g. in the application of the tool for the environmental performance reviews, or in the production of previous outputs such as the global status report).
14. Electronic survey forms were developed, in consultation with the UNECE project manager, and were disseminated to the stakeholders that were identified. These were disseminated through the Redcap system.¹ The forms included a section on “willingness to participate in an interview” and those who responded positively were contacted by the evaluator. The interviews were conducted to elaborate the answers of the respondents in the survey. Emails were also sent for further clarifications.
15. As the relevant topics involved in this evaluation are quite specialized, the number of possible targeted respondents is also quite small. The agreed upon list of invitees for the survey and interviews consisted of 13 external users, 9 modelers, and 6 UNECE users/staff (from the original list provided by UNECE of 9 external users, 8 modellers, and 6 UNECE users).² While there were no gender-based issues that were identified to be critical in the evaluation of the project, the identification of the respondents took into consideration achieving gender balance. For example, the scanning of external publications identified two female invitees for the survey/interview (out of the five female invitees in the final list). Twelve (12) of the invitees filled out the survey forms (4 external users; 6 modelers; and two UNECE personnel). Five (5) of the respondents also expressed their willingness to be interviewed and were thus interviewed (3 modelers, 2 UNECE personnel) as shown in Table 1 below.

Table 1. Respondents and Interviewees

	UNECE Original List	Final List	Survey Respondents	Interviewees
External Users	8	13	4	
Female	2	4	2	
Male	6	9	2	
Modellers/Expert	8	9	6	3
Female	1	1		
Male	7	8	6	3
UNECE Users/Staff	6	6	2	2
Male	6	6	2	2
Grand Total	22	28	12	5

¹ See : <https://www.project-redcap.org/>

² The modelers also included UNECE staff who have strong backgrounds on energy and emissions modelling. The UNECE personnel consisted of technical and management staff involved in the ForFITS project (and may not be with UNECE anymore).

16. In addition, subsequent efforts to gather information from relevant representatives of the different UN regional commissions (Economic Commission for Latin America and the Caribbean – UNECLAC, United Nations Economic and Social Commission for Western Asia - UNESWA, United Nations Economic and Social Commission for Asia and the Pacific - UNESCAP) were conducted by UNECE. In particular, information on activities done with ForFITS in the 2014-2018 period were sought. Such information was received only from UNESCAP.
17. Section 6.3 provides the original questions based on the Terms of Reference (See 6.2), as well as the linkages between the elements of the desk review, surveys and interviews that were used in answering such questions.
18. The ratings used in this evaluation are: satisfactory; partially satisfactory; unsatisfactory.

FINDINGS

2.1. Background

19. The UNECE, in cooperation with the other UN Regional Commissions launched the ForFITS project in 2011 order to develop and implement a tool for assessing CO₂ emissions from inland transport. The project was funded by the seventh tranche United Nations Development Account (UNDA) and aimed at enhancing international cooperation and planning toward sustainable transport policies with the goal of facilitating climate change mitigation (ECE/TRANS/2015/18).
20. At the heart of the project is the ForFITS model which was developed to assist users in making informed decisions relating to transportation CO₂ emissions reduction. It allows for the comparison of the potential CO₂ emissions impacts of a policy scenario against the baseline scenario and thus supports sound discussions about potential mitigation options.
21. The model was developed and was piloted in seven countries around the globe during the first phase of the ForFITS project (2011-2014).³ A post-implementation evaluation was conducted at the end of 2013 and was published in 2014 (Bhandari, 2014).
22. In 2014, the ForFITS UNECE-wide implementation project commenced with the aim of producing sound basis for region-wide trends in vehicle activity, energy use and CO₂ emissions from inland transportation in the UNECE Member States (Informal document IT/2016/No.13). The initiative resulted in projections of well-to-wheel transport CO₂ emissions for each of the 41 countries that had ample data, as well region-wide projections involving 56 countries. The paper was presented at the 76th session of the Inland Transport Committee last February 2016.
23. Aside from the regional study, UNECE carried out studies to support CO₂ emissions studies in Belarus, Georgia, Albania, and Tajikistan, as part of the Environmental Performance Reviews (EPRs) led by the UNECE Environment Division (ECE/TRANS/2017/24). The EPRs are an assessment of the progress of a country in relation to its environmental and economic targets, as well as in meeting its international environmental commitments. It contains a specific chapter on transport and environment wherein ForFITS has been utilized in the analysis for the aforementioned countries. Some of the other EPRs that were published during the period only utilize official GHG inventories in relation to the discussions relating to transport GHG emissions (e.g. Serbia, Republic of Moldova, Montenegro, Bulgaria).

³ The ForFITS model was piloted in these countries: Chile, Ethiopia, France, Hungary, Montenegro, Thailand and Tunisia.

24. The use of ForFITS is included in the Draft Strategic Frameworks of the UNECE Transport subprogramme (ECE/TRANS/2014/25; ECE/TRANS/2016/30) and has been integrated into the Programs of Work of the Transport subprogramme (ECE/TRANS/2016/28; ECE/TRANS/2016/30).
25. It has also been used within the context of the Transport, Health and Environment Pan-European Program (THE PEP) which is jointly being implemented together with the World Health Organization (WHO) Europe and UNECE (Environment, and Sustainable Transport Divisions). The first application of ForFITS in the context of THE PEP coincided with the PEP relay and workshop that took place in Kaunas, Lithuania in September 2014 (UNECE Secretariat, 2014).
26. A few external publications refer to ForFITS while conducting a comparison of different transport emissions calculators such as Vilchez, et al (2015), Simenc (2018), and da Silva (2015). Three articles were found which utilized the ForFITS model directly in analysing emissions scenarios and/or evaluating emission mitigation interventions as shown in Table 2 below. These authors have interacted with UNECE in the conduct of their studies, particularly in relation to technical matters concerning the use of the tool. UN regional commissions seem to have played a minor role, mainly to introduce the tool during its development and direct towards UNECE for any additional support.

Table 2. External Publications that Utilized ForFITS

Author	Title	Geographical Scope of Analysis
Menezes, Maia, & Carvalhoc (2017)	Effectiveness of low-carbon development strategies: Evaluation of policy scenarios for the urban transport sector in a Brazilian megacity	Sao Paulo, Brazil
Haddad, Mansour, & Afif (2017)	Future Trends and Mitigation Options for Energy Consumption and Greenhouse Gas Emissions in a Developing Country of the Middle East Region: A Case Study of Lebanon's Road Transport Sector	Lebanon
Zawieska & Pieriegud (2018)	Smart city as a tool for sustainable mobility and transport decarbonisation	Warsaw, Poland
Ravache (2014)	Modélisation globale des émissions de CO ₂ liées aux déplacements dans le Grand Lyon	Grand Lyon, France

27. A feasibility study on the possibility of incorporating a new module on non-road mobile sources into ForFITS was supported by Environment Canada (EC). The study confirms the feasibility of such an addition, but the implementation of such is subject to the availability of funds (ECE/TRANS/2017/24), the sources of which have not been identified to date.
28. During the seventy-ninth (79th) session of the ITC held in Geneva last February 2017, a 2016-2018 ForFITS work programme was presented by the Sustainable Transport Division for scaling up the use of the ForFITS tool, as well as for enhancing the model itself. The activities stated in the work programme were recognized to be subject to fundraising for extrabudgetary projects (ECE/TRANS/2017/7).

2.2. Project Objectives

29. The original development objective of the ForFITS project was to enhance international cooperation and planning towards sustainable transport policies and the specific project outcomes comprising of:
- Increased awareness of the cause – effect relationship between the different transport modes, energy and CO₂ emissions based on internationally comparable information on inland transport CO₂ emissions;
 - Enhanced capacity to assess and monitor and to take actions to reduce transport CO₂ emissions

30. While there are no specific objectives that have been set for the adoption of ForFITS within the period 2014-2018, the UNECE Transport subprogramme strategic frameworks (2016-2017, 2018-2019) mention the following:

2016-2017 (ECE/TRANS/2014/25) p.4

“Capacity-building: Special attention will be given to further strengthening the national capacity of countries, assess the environmental performance of their transport sector using the ForFITS (For Future Inland Transport System) tool, as well as the ways in which the transport and logistics sector contribute to national competitiveness.”

2018-2019 (ECE/TRANS/2016/30) p. 4

“Capacity-building to further strengthen the national capacity of countries, with a particular focus on promoting sustainable transport. In response to the increased demand for evidence-based decision-making on climate change mitigation and adaptation, on reduction of local pollutants and on making mobility safe at the international, national and local levels, the sub programme will use the **ForFITS (For Future Inland Transport System) tool** and its new modules to assess the environmental and safety performance of the transport and logistics sector, and its contribution to national competitiveness and sustainable urban mobility. Particular focus is placed on the development of capacity for high-quality transport statistics.”

31. The Sustainable Transport Division’s ForFITS 2016-2018 Work Programme (ECE/TRANS/2017/7) specifically mentions the following items as priorities for the further development of the ForFITS model, subject to extra-budgetary resource availabilities:

ECE/TRANS/2017/7 p. 3

“A. Further Development of ForFITS model...

1. Development of a new module on local pollutants
2. Development of a new module on non-road mobile machinery
3. Development of a new user interface”

32. The said document also mentions the following items under “use of existing ForFITS model.⁴”, also subject to extra-budgetary resources availabilities:

ECE/TRANS/2017/7 p.4

“B. Use of the existing ForFITS model...

1. Training sessions
2. Specific analyses for specific countries”

REVIEW FINDINGS

3.1. Relevance

33. The review finds that the relevance of the activities conducted under the second phase of ForFITS is satisfactory.
34. The review highlights that ForFITS is in line with the UNECE mandate of facilitating greater economic integration and cooperation and promoting sustainable development and economic prosperity as it can be used for policy dialogue, negotiation of international legal instruments,

⁴ No specific activities, and targets were mentioned in the currently available documents.

development of norms and regulations, and in the exchange of best practices and technical expertise.

35. ForFITS has been relevant to the implementation of the activities under Cluster 8 of the UNECE subprogramme on transport: Transport, Health and Environment Pan-European Programme (THE PEP), particularly in terms of building capacity towards better integration of transport, health and environment policy. The utilization of ForFITS within the context of UNECE is based on the Strategic Framework of the UNECE Transport Sub-programme (ECE/TRANS/2014/25; UNECE, 2015) and has been integrated into the 2016-2017 Programme of Work of the Transport Sub-programme (ECE/TRANS/2016/28, ECE/TRANS/2016/28) wherein ForFITS was mentioned as the tool for conducting assessments on the environmental performance of the transport sector.
36. As shown in Figure 1 below, the survey responses reveal that ForFITS is deemed to be most suited for modelling the impacts of policies relating to biofuels as well as vehicle technologies. Its suitability in modelling the impacts of urban mobility measures is deemed to be lowest (see Section 3.2.2. for further discussions).⁵

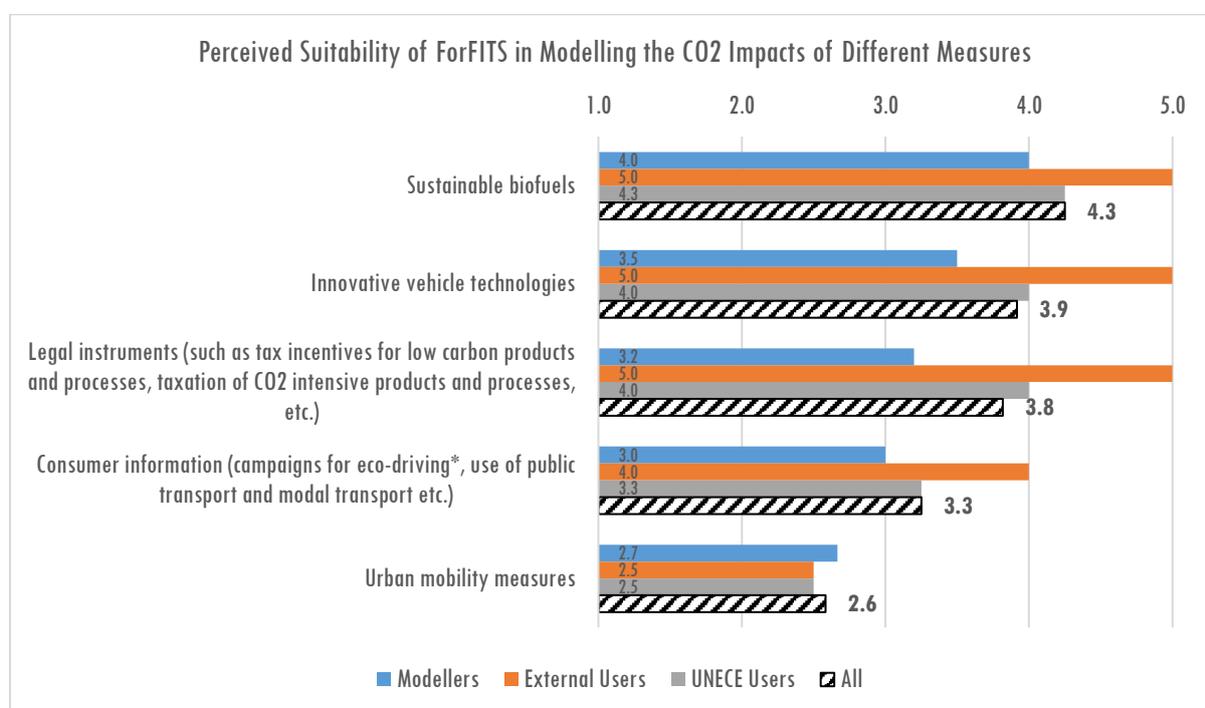


Figure 1. Perceived Suitability of ForFITS for Impact Evaluation

Note: The figure depicts a rating scale where 1 is "Not Suitable" and 5 is "Highly Suitable"; number of respondents: 6 modellers; 2 internal UNECE; 4 external users

37. Majority (7 out of 13) of the respondents also agree/ strongly agree that the scope of the tool is suited for addressing transport emissions modelling-related needs for inland transport in the UNECE contracting parties.

⁵ These are CO₂ abatement and fuel efficiency improvement interventions listed under the "Climate Change and Sustainable Transport" section of the UNECE website (https://www.unece.org/trans/theme_global_warm.html).

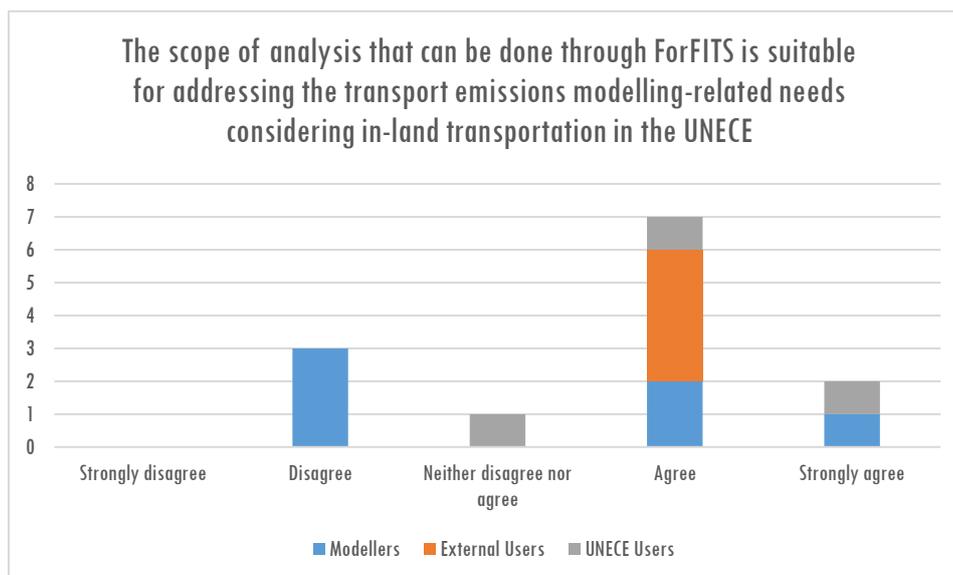


Figure 2. Perceptions on the Suitability of the Scope of ForFITS in the Context of the UNECE/ Users

38. The views of the external users also confirm that the scope of the tool itself meets the requirements of their studies (4 out of 4 respondents) which also implies that the tool's scope enables it to be relevant towards being used to assess locally-defined emissions abatement interventions in the transport sector.
39. Several of the UNECE official documents refer to ForFITS primarily as a means for supporting wider transport goals such as those stipulated in the Sustainable Development Goals (SDGs) (ECE/TRANS/2016/30), and in supporting the strengthening in-country capacity building and assessing the performance of the transport sector (ECE/TRANS/2016/28; ECE/TRANS/2018/23), as well as the development of policy recommendations (UNECE, 2017).
40. The ForFITS model provides an opportunity towards contributing to the following sustainable development goals.⁶
1. SDG 7 (Good health and well-being) Target 7.3 – By 2030, double the global rate of improvement in energy efficiency;
 2. SDG 11 (Make cities and human settlements inclusive, safe, resilient and sustainable) Target 11.2 - By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons;
 3. SDG 12 (Ensure sustainable consumption and production patterns) Target 12.c - Rationalize inefficient fossil fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities;
 4. SDG 13 (Take urgent action to combat climate change and its impacts) Target 13.2 - Integrate climate change measures into national policies, strategies and planning.

⁶ The addition of an air pollution module would make ForFITS also relevant to SDG 3 Ensure healthy lives and promote well-being for all at all ages.

41. The United Nations deem that climate change is the defining issue of our time (United Nations, n.d.^b). A common understanding that there is a need to increase the capacity of countries in dealing with climate change mitigation and adaptation, ForFITS is seen to be relevant within this context. Climate change and sustainable transport has been identified as one of the key areas of work of UNECE. As seen on Figure 3 below, the percentage contribution of UNECE contracting parties to the global CO₂ emissions are significant, particularly in terms of transportation (60%) and road transport (80%) CO₂ emissions. But while the sector is recognized as a key source of CO₂ emissions in the region, there exist significant opportunities for a tool such as ForFITS in supporting the estimation and national transport CO₂ baselines and scenario projections.

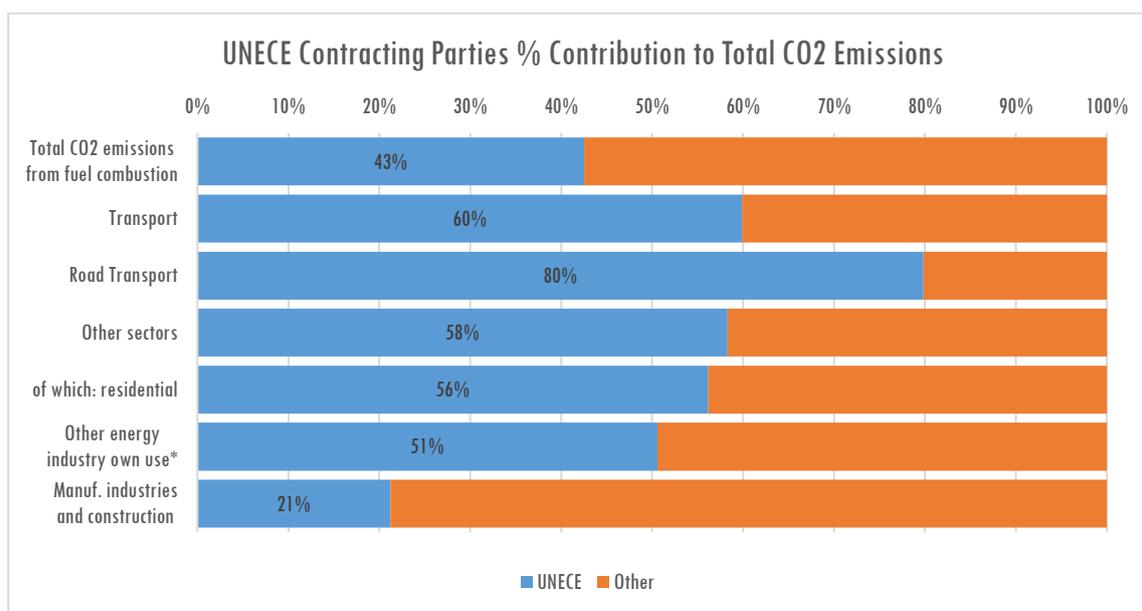


Figure 3. UNECE Contracting Parties Percentage Contribution to CO₂ Emissions

Source: Original data taken from IEA CO₂ Emissions from Fuel Combustion 2018 (IEA, 2018) and country values were transformed into percentage contributions.

42. This review also notes that women commonly face greater levels of risks and burdens from the impacts of climate change, particularly in situations of poverty (U.N., n.d.^c, “Introduction to Gender and Climate Change.”). Gender issues are also engrained in transportation, as it has gendered impacts on human health, accessibility, as well as marginalization (GenderCC, n.d., “Transport, Gender and Climate Change”).
43. ForFITS, being an official UN tool, is in a strategic position to further accelerate climate change mitigation policies and measures, not only in the contracting parties of the UNECE, but also in other parts of the globe. Globally, transportation accounts for 24% of the total CO₂ emissions from fuel combustion (IEA, 2018). Its flexibility in terms of providing country level analysis is also an advantage in the light of the developments in the global climate change policy regime.
44. Some examples of the external applications of ForFITS outside the purview of the UNECE suggests that such a tool is relevant in supporting Nationally Determined Contributions (NDCs). The study done by Haddad et al. (2017), for example, utilizes ForFITS in evaluating the potential impacts of measures that are directly linked to Lebanon’s NDCs (i.e. improving vehicle fuel efficiency, increasing the share of hybrid electric vehicles, and increasing the share of mass transport).
45. The UNECE-led application of ForFITS was highly relevant in the “undertaking of analytical activities” as specified in the 2016-2017 Programme of Work of the Transport Sub-programme. It was also relevant in supporting the THE PEP, and in the conduct of the EPRs The technical reports that have been produced by UNECE during the second phase (e.g. Albania, Belarus, Georgia,

Kaunas, Lithuania, Mannheim and Tajikistan) are deemed to be relevant in relation to the specific needs and priorities of the aforementioned countries and cities as these have provided detailed information regarding trends and projections (e.g. relating to vehicle stock, vehicle activity, energy use, emissions) that would have been useful in policy discussions. The technical reports provide robust supporting evidence for specific priority interventions that deserve deeper investigation.

46. In terms of the need for such a model in the UNECE region, only a handful of countries, for example, have explicitly mentioned specific tools that they have used in estimating transport emissions and assessing policy pathways in their Nationally Determined Contributions (NDC) documents towards supporting the Paris Climate Agreement as seen in Section 6.5. Many of the countries also do not currently have transport-specific actions that have been committed under the NDCs. The actions outlined in these NDCs are often similar to the policies that have been analysed through ForFITS. This suggests that there still exist significant opportunities for the diffusion of the use of tools such as ForFITS.

3.2. Effectiveness

47. The effectiveness of the activities in achieving the expected accomplishments is found to be partially satisfactory.
48. The conduct of the case studies is deemed to have produced the relevant outputs as evidenced by the technical reports conducted by the UNECE.⁷ The existence of the external publications based on the use of ForFITS as a transport CO₂ modelling tool (see Table 2) suggests that the tool is effective in providing robust analytical results as intended.
49. In relation to the plans for further developing ForFITS based on the Sustainable Transport Division's 2016-2018 Work Programme (ECE/TRANS/2017/7), the evaluation points towards the lack of significant progress in moving towards the fruition of the changes that were initially identified, as those were subject to extra budgetary funds.
50. While the documentation of the model is deemed to be sufficient as expressed by the survey respondents, self-study is maybe time consuming and difficult, particularly for inexperienced users. The lack of capacity building activities during the 2014-2018 period, due to shortage of available resources for such activities, may have significantly contributed to the decline in the usage of the tool.
51. For this evaluation, it is deemed worthwhile highlighting the strengths and challenges that have been identified in the survey and interviews as discussed below.

3.2.1. Strengths of ForFITS

52. The following characteristics were identified as the main strengths of ForFITS as a modelling tool:

Model Capabilities

53. One of the interview respondents recalled that as compared to other similar models during the time of development (i.e. the Mobility Model (MoMo) of the International Energy Agency (IEA)), ForFITS was able to better reflect the impacts of "avoid" and "shift" policies while being highly robust in modelling improve policies. As mentioned by one of the respondents, the ForFITS model enabled country-level analysis which was not possible with MoMo during that time. ForFITS also includes a larger scope (e.g. inclusion of pipelines, NMT, water vessels, air, rail) as compared to other similar tools that were available during the relevant period. It also utilizes a mechanism for decomposing

⁷ Includes the following: ForFITS report for Albania, Belarus, Lithuania, Mannheim, Tajikistan, as well as the regional study (Informal document ITC (2016) No. 13).

fuel use into activity, energy intensity, and structural components. It has a very detailed structure for enabling analyses considering different areas, modes, transport service types, vehicle classes, and powertrain technologies.

54. A key strength of ForFITS is highlighted by Menezes, et al. (2017) who mention that one ForFITS integrates the representation of the relevant aspects that define a transport system, as well as the inclusion of technological and socioeconomic impacts in the resulting GHG emissions and enables the exploration of feedback effects of relations of causes and effects between the demand and services of the transport sector.
55. The other strengths of ForFITS, as a model, as deemed by the international modellers include the following: comprehensive modelling architecture; logical manner by which it accounts for policy changes; Baseline data accuracy and precision, conceptual intuitiveness and pragmatism of modelling assumptions and approach; ability for utilizing user inputted country specific data.

Freely Available

56. The use of VENSIM, coupled with Excel interfaces for inputting data requirements was therefore seen to provide a balance between the robustness of the modelling results, and in making the model accessible. VENSIM can also produce results in database format. Three of the external users indicated that the freely available nature of ForFITS was highly important (and one indicated it as “important”) in their choice in utilizing the model for their studies. The responses of the external users, as well as the interviews with the internal users, and modelling experts indicate that the freely available nature of ForFITS was highly important in their choice in utilizing the model for their studies. Three of the four external users rated this attribute of ForFITS with 5 (out of 5) while one external user rated it as 3 in terms of importance in selecting the model for their studies.
57. It must also be noted that extensive technical documentation is also provided through the UNECE website. On the other hand, there is lack of information gathering regarding the downloads of this free tool. It was pointed out by one of the UNECE staff that a mechanism for gathering information about the users of the tool may prove to be beneficial for monitoring the potential applications of the tool and may be integrated with the process of downloading the tool through a simple form.

ForFITS as a United Nations Tool

58. Two of the interviewees also pointed to the advantage of ForFITS being a “UN Tool.” As the tool has been used in numerous applications within the purview of the UN, has utilized consistent processes, and has produced robust modelling results, such characteristics can be valuable in branding and promoting the tool for accelerated adoption.

3.2.2. Main Challenges Relating to the Usage ForFITS

59. Based on the survey results and interviews, there were several main challenges that users faced, as summarized below:

User Interface

60. A common challenge that was identified in all the three interviews relates to the user-friendliness of the interface of ForFITS. The need to have significant improvements in the tool’s user interface was also recognized in UNECE (2015) as well as in ECE/TRANS/2017/7. The complexity of the tool, even if sufficient documentation is available online, “puts off a people” in using it, as one interviewee puts it. Three interviewees also mentioned that there seems to be a “black box” effect due to the inherent complexity of the model. One interviewee also mentions that while the mechanisms embedded in the model are documented, external users would still have difficulties in understanding the model. Sometimes, the model responds in ways that are difficult to control, primarily due to the

high sensitivity of certain inputs, one respondent states. One respondent mentions that the complexity of the interface, combined with the data-intensive nature of the tool have made it difficult to deploy the tool, in general. Another respondent mentions that the user interface is not particularly friendly for new users, and that prior knowledge on the use of VENSIM is needed.

61. ForFITS utilizes a combination of a systems dynamics tool (VENSIM) and Microsoft Excel (for input data). VENSIM is also used in similar models, such as the International Energy Agency's World Energy Model, and was a platform that enabled making ForFITS freely available through the use of the VENSIM Model Reader as explained by one of the interviewees.⁸
62. The use of VENSIM, coupled with Excel interfaces for inputting data requirements was selected during the development phase as this approach was therefore seen to provide a balance between the robustness of the modelling results, and in making the model accessible. However, as one respondent pointed out, while users don't need to purchase VENSIM in running ForFITS, without access to the actual code, errors that occur during the running of the model, coupled with the lack of understanding of what's really happening at the backend of the model, may pose significant impediments to the users, and inhibits user-initiated enhancements.
63. Another respondent states that while VENSIM has a visual interface showing interactions between the variables, it can get complicated quickly for the users (e.g. a respondent explains that ForFITS has 46 views in VENSIM which are quite complex on their own, and that the size of ForFITS has reached VENSIM's computational limit, as pointed out by one of the interviewees). There were also impressions that VENSIM can primarily be used by modellers, and that it is difficult to set-up, handle and understand if you have not prior knowledge. In terms of performance, one respondent mentioned that he deems that ForFITS takes excessive amounts of time for doing what it does as compared to other tools. The use of the Excel input interface may also lead towards complicated issues, particularly if the structure of the Excel file is changed. Five (5) of the 6 modelers deem that VENSIM is not an appropriate modelling environment for ForFITS.

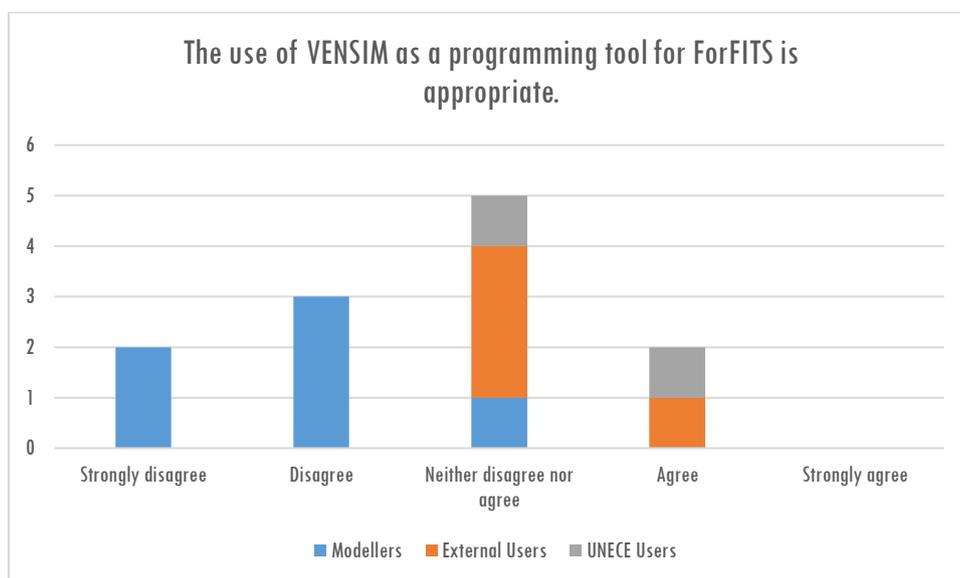


Figure 4. Appropriateness of VENSIM as a programming Tool for ForFITS

64. The use of the Excel input interface may also lead towards complicated issues, particularly if the structure of the Excel file is changed.

⁸ See <https://vensim.com/vensim-model-reader/>

65. All three of the interviews revealed that the complexity of the ForFITS tool may not necessarily be useful in terms of convincing policymakers to act. Policymakers want to know impacts of specific projects, as well as their potential impacts when up-scaled. For these types of applications, one needs very simple tools. The accuracy of the storylines is more important than the precision of the numbers themselves. Suggestions for moving towards solely using Microsoft Excel as a platform for ForFITS were also made by two of the interviewees. A specific example of an excel-based model was provided by one of the interviewees – the Asian Development Bank (ADB) Transport Databank Model has been developed in Microsoft Excel and is also capable of analysing policy options within different system levels (national, urban, non-urban), and accounts for different modes and technologies.⁹ This model was also based on the activity-structure-energy intensity- emissions framework, as with ForFITS.

Model Limitations

66. It was pointed out by two of the interviewees that there were instances when users wanted to implement ForFITS for showing the effect of a certain policy, but the policy was not part of the model. The current version of ForFITS is also said to have reached the limits of VENSIM (32-bit) and this proves to be a challenge in terms of including additional modules such as air pollution. It must also be noted though that the development phase of ForFITS was conducted within limited time, resources, based on the UNDA project as pointed out by one of the interviewees, and that the original objectives of the development phase were fully achieved given these constraints.
67. While ForFITS is stated to be capable of modelling CO₂ impacts of policies at the urban level, it must be noted that ForFITS inputs is based on vehicle registration which limits it in terms of accurately estimating emissions that occurs within an urban area as the percentages of vehicles crossing boundaries may be significant. It is also more difficult to get corroborative evidence for supporting urban-level estimates as compared to national level estimates which can be cross-checked with national fuel consumption figures for transportation. Other factors that are important in assessing transport interventions at the urban level may not necessarily be captured adequately in ForFITS (i.e. impacts of congestion).
68. It is also noted that ForFITS was not set-up as an optimization tool, as such would have been more cumbersome for the users as opposed to it being a scenario analysis tool, as mentioned by one interviewee. Another interviewee mentions that the tool does not consider modelling error, as it is deterministic in nature. Due to the rapidly evolving contemporary issues relating to transportation (e.g. automation, shared mobility, disruptive mobility), ForFITS may not be able to adequately capture the impacts of such, as it still relies on the ownership paradigm to generate vehicle stock and vehicle travel.

Data Requirements and Implementation Arrangements

69. Currently, the model requires detailed data which may not necessarily be readily available in many of the beneficiary countries. In some cases, in the earlier application (e.g. regional study), even the vehicle stock data was not available, as mentioned by one of the interviewees. The level of data availability vis-à-vis the tool requirements are detailed in UNECE (2015). It states, for example, that there were 9 countries which did not have any available fuel consumption averages for any of the vehicle types. Similarly, average travel, load, and power breakdown figures were not available for any of the vehicle types for 5 countries (different sets of countries for each parameter).
70. As considerable data requirements for running the model were needed, in some cases in the internal applications (i.e. the Environmental Performance Reviews), the process of implementing ForFITS take considerable amounts of time, including such required for the hiring of local consultants, consultations regarding the data needed for the model, the actual collection and validation of data, and the analysis itself, as stated by one of the interviewees. One survey

⁹ See <http://transportdata.net/en/page/11>

respondent mentions that in-country modelling processes require technical assistance and not just the provision of guidance, which is not provided in the current ForFITS set-up.

71. While the conducted UNECE activities (e.g. analytical work and report development) have produced the intended accomplishments in terms of assisting in providing environmental assessments of the countries' transport sector, there lacked activities capacity building in terms assessing the environmental performance of their transport sector using ForFITS (as per the UNECE ITC Strategic Frameworks) into full fruition. This, again, can primarily be attributed to the lack of resources for mobilizing tool enhancements, capacity building, and tool dissemination.

3.3. Efficiency

72. The efficiency by which the conducted activities were delivered is rated as satisfactory.
73. In terms of the financial and human resources that were allocated to the deployment of the tool, the interviews (and the estimated staff time allocation dedicated for ForFITS) with the UNECE personnel suggest that the allocated personnel and financial resources would have not fully supported the intended improvements and dissemination of ForFITS as stated in Section 2.2. On the other hand, evidence suggests that even with the limited manpower within UNECE, sufficient and timely support for the external users were provided during the evaluation period.
74. Currently, only two staff members are directly involved in ForFITS (25% of P-3, and 5%-10% of P-2 staff time allocation, respectively), costing an average of 18.5 thousand USD per year.¹⁰ The evaluator was also informed that no non-post budget allocation for the initiative. It was mentioned through the interviews with the UNECE staff that work related to ForFITS in the relevant period has primarily been focusing on providing technical guidance to external users. The work on ForFITS compete with those which have official mandates, and ForFITS-related work has become a "secondary priority" due to the lack of clear mandates, and work has been scattered depending on other work priorities. Ideally, additional dedicated personnel and financial resources for the second phase of the program should have been provided in order to put the intended developments into fruition. It is in the opinion of the evaluator that the allocated time (based on the figures for the two staff) would have not been enough to perform significant maintenance and updates that resemble the planned ones, provided that time was also needed to tend to external queries, as well as to the development of the internally-produced studies.
75. As stated in the 2016-2018 ForFITS work programme the scaling up the use of the ForFITS tool, as well as for enhancing the model itself are subject to fundraising for extrabudgetary projects (ECE/TRANS/2017/7). Despite initiatives by the secretariat for extra budgetary funded projects to further develop ForFITS, no financial resources could be allocated to ForFITS in the second phase, other than the feasibility study for Non-Road Mobile Machinery module.¹¹
76. While there were limited resources for ForFITS in 2014-2018, the email correspondences suggest that the UNECE staff provided sufficient and timely support for those external users who have asked for technical guidance in the use of the tool. All the substantial issues in the inquiries sent through email were resolved through the support of the UNECE staff. Timeliness was also observed, as six out of the ten relevant technical inquiries were addressed within (or less than) two working days. However, it must also be noted that the relevant interviews point towards the fact that current manpower, while being effective in providing the needed technical support, is limited in realizing the intended expansion of the applications, and dissemination of ForFITS.

¹⁰ Approximately 93 thousand USD in total from 2014-2018.

¹¹ The proposals/concept notes shared to the evaluator included the "Flagship project: ForFITS Tool for emission reduction in transport" as well as the "Strengthening the capacity of governments in all UN regions to reduce air pollution and Green-House-Gas (GHG) emissions from inland modes of transport."

3.4. Sustainability

77. The sustainability of the project is rated to be partially satisfactory.
78. The specific research outputs related to ForFITS that came out within the 2014-2018 period include applications in several countries (Albania, Belarus, Georgia, Lithuania, Tajikistan), as well in two cities (Kaunas, Lithuania; Mannheim, Germany) internally. The external studies included applications in more cities such as Sao Paolo, Brazil; Lyon, France; Warsaw, Poland; and in Lebanon.
79. Case-specific data have been utilized in the aforementioned studies were used, commonly historical data on vehicle numbers, consumption, occupancy rates, travel distances, socio-economic data.
80. Table 3 below shows the types of scenarios in the technical studies. The scenarios are translated into changes in the parameters in the ForFITS model such as vehicle kilometres travelled, average vehicle occupancies, vehicle efficiencies, emission factors, as well as changes to the passenger transport system index, transport characteristic index and the environmental culture index. These indexes have been made specifically for ForFITS in order for the tool to consider the effects of wider systemic changes brought about by behavioural change, for example, on vehicle ownership.

Table 3. Scenarios and Assumptions: Applications Involving ForFITS

Author and Area	Policy Scenarios	Factors Modified
Haddad, et al. (2017); Lebanon	increase share of fuel-efficient vehicles (FEV)	This was implemented in the modelling by setting an FEV target of 35% in 2040, combined with a progressive increase in gasoline prices up to 150% of the 2010 base year levels by 2040
	Increase share of FEVs and hybrid vehicles	It is assumed that the annual share of HEV (hybrid electric vehicles) sales out of all newly registered vehicles can increase to a relatively conservative figure of 10% by 2040.
	increase share of mass transport	This is modelled by increasing the share of passenger kilometres travelled from 31% in 2010 [44] to 45% by 2040, determined to be consistent with the derived passenger transport system index of 0.15.
Menezes, et al. (2017); Sao Paolo, Brazil	Promoting teleworking	Reduction in annual distance travelled per vehicle/year; reduction in public transport load
	Stimulating shared transport	Increase in the average number of passengers of light vehicles
	Improving urban transport system management	Passenger transport system index revised
	Improving energy efficiency of motorized vehicles	Increased rate of evolution of energy efficiency
	Incentivizing biofuels	Adjustment in the rates of variation of annual emissions according to a rise in use of biofuels
Ravache (2015); Grand Lyon, France	Doubling of price of oil	The doubling of the price of oil is reflected in ForFITS by identical multiplication of the price of petroleum-based fuels: gasoline, diesel, LPG and kerosene.
	Price oil increase + Shift to public transport	This scenario assumes that the gap between the initial value of the transport characteristic index (TCI) and 0.7 is reduced by 20% in 30 years.
Zawieska and Pieriegud (2018); Warsaw, Poland	Decrease in average fuel consumption of motorcycles, cars, HGV and buses	The OPTI scenario assumes a 30% decrease in average fuel consumption for motorcycles and personal cars, and a 25% decrease for heavy goods vehicles (HGV) and buses.
	"OPTI Scenario"	In this scenario both factors decrease 20% by 2050, based on the assumption of implementing Directives 2009/28/EC and 2009/30/EC, and by another 10% due to additional technological improvements

Author and Area	Policy Scenarios	Factors Modified
	Well to wheel and tank to wheel emission factor reduction	
	“OPTI Scenario” Change in the powertrain shares	Shares of the different fuel types within the ICE (internal combustion engine) category is assumed for 2050 and interpolated for the other years.
	“OPTI Scenario” Improvement in mobility preferences and transport behaviour	The Passenger Transport Index rises by 20%, while the Environmental Culture Index reaches a peak point in 2050.
	“OPTI Scenario” Fuel price and taxes	This scenario assumes a 50% increase in the price of oil compared to the average price in 2008.
	TECH Energy efficiency	The TECH scenario assumes an increase in the energetic efficiency of vehicles of 50% by 2050.
	Well to wheel (WTW) and tank to wheel (TTW) emission factor reduction	the reduction of well-to-wheel (WTW) and tank-to-wheel (TTW) factors is projected to reach 50%.
	Change in the powertrain shares	Shares of the different fuel types within the ICE category is assumed for 2050 and interpolated for the other years.
	Smart city scenario (ITS + emerging vehicle technologies + smart public transport + smart logistics + smart citizens)	The components listed in this scenario have been deemed by the author as not included in ForFITS (e.g. ITS, emerging technologies – automated vehicles, internet of things, smart public transport, logistics, smart citizens) and have used direct reduction factors.
UNECE; Albania	Shift to public transport	the gap between the passenger transport system index value calculated in the base year and the 0.7 target value characterizing regions which trend toward high density and high use of public transport
	Shift to electric vehicles	This scenario assumes that new vehicle registrations of electric passenger cars and electric buses will increase linearly in such a way that the share of electric powertrain in the fleets of passenger cars and of buses will be 8 percent and 20 percent respectively by 2030.
	Shift to freight rail	This scenario simulates a shift from medium- and heavy-duty trucks to railway in such a way that the share of tonnes lifted by rail in the total of tonnes lifted by large-freight modes (medium-duty trucks, heavy-duty trucks, rail and pipelines) will increase linearly from 3 % to 15 %.
	Combined scenario	Combination of the alternative scenarios
UNECE; Belarus	High GDP growth	5% growth in GDP as compared to the 2% growth in the base scenario
	High fertility growth	While the reference scenario projects a 0.5% annual decrease in population, this scenario projects an annual decrease of 0.3% and will be used in this scenario.
	Fuel price increase	The evolution of the average fuel price is assumed linear and the changes in the prices are assumed to influence directly the cost of all fuel blends.
	Nuclear/ increased electrified rail	As nuclear power typically is more efficient than traditional forms of power generation, the nuclear/increased electrified rail scenario will decrease the difference in well to tank (WTT) emissions for electricity between Belarus and France – a country which relies heavily on nuclear power – by half by 2030.
UNECE; Georgia	Shift to public transport	The gap between the passenger transport system index value calculated in the base year and the 0.7 target value characterizing regions which trend toward high density and high use of public transport as GDP increases is assumed to

Author and Area	Policy Scenarios	Factors Modified
		be progressively reduced by 20 per cent between the base year and 2040.
	Shift to freight rail	The shift to freight rail scenario in Georgia consists of increasing the shares of tons lifted by rail by 5 percentage points at the expense of heavy-duty trucks.
	Vehicle fleet renewal	This scenario does not directly specify the policy interventions required to achieve the goal of halving the average personal passenger car life by 2040. ¹²
UNECE; Lithuania and Kaunas	Alternative GDP and population projections	Alternative fertility scenario and GDP assumptions were used compared to the base scenario.
	Shift to public transport	To simulate this change, the ForFITS passenger transport system index was modified
	Culture shift	To simulate this change, the ForFITS environmental culture index was modified.
	Shift to electric vehicles	The scenario based on this action projects that by 2040 (a) almost 50% of two-wheelers will be electric; (b) almost one third of LDVs (light duty vehicles) will be electric-petrol (or diesel) hybrids; (c) almost two thirds of buses will hybrids; (d) rail vehicles will shift to approximately 40% hybrid and 60% electric; and (e) approximately 13% of large road freight vehicles will be hybrids.
	Combined scenario	Combination of the alternative scenarios
UNECE; Mannheim	Environmental Culture Shift (behavioural shift towards more environmentally conscious transport patterns)	For this scenario, the environmental culture index value grows to 1.0 (very high environmental consciousness) by 2045.
	Shift to public transport	In the shift to public transport scenario, the gap between the passenger transport system index value calculated in the base year and the 0.7 target value characterizing regions which trend toward high density and high use of public transport as GDP increases is assumed to be progressively reduced by 20 per cent between the base year and 2040 (from 0.12 to 0.23).
	Combined scenario	Combination of the alternative scenarios
UNECE; Tajikistan	Vehicle fleet renewal scenario	Assumes that the average age of the vehicle fleet is reduced by a third in 2030
	Shift to public transport	Assumes that the gap between Tajikistan's current passenger transport characteristic index and the 0.7 target is reduced by 13 percent between 2013 and 2030
	Increase in LPG share	In this scenario, the increase in the share of LPG vehicles will increase to 38% in 2030 (25% in 2013), and the increase is mirrored by decreasing shares of gasoline vehicles.
	Combined scenario	Includes a combination of the vehicle fleet renewal and shift to public transport scenarios.

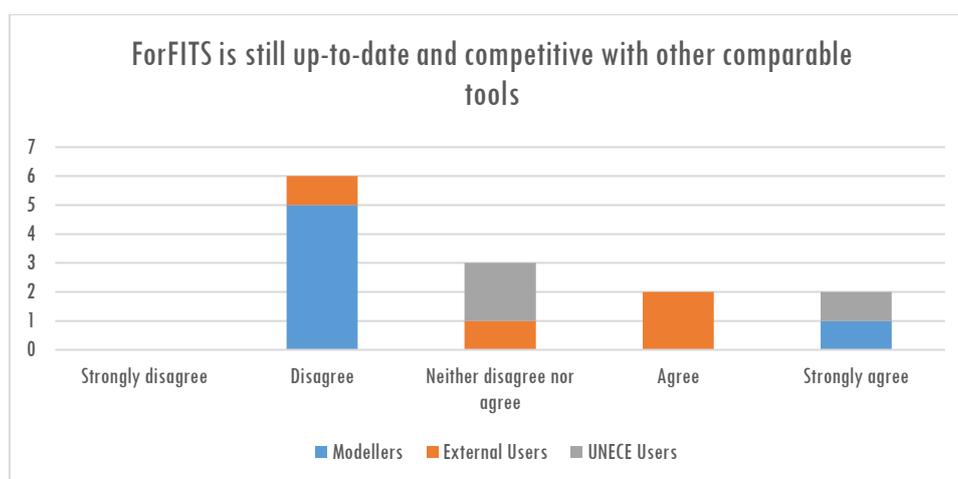
81. These applications show that the main features of ForFITS have been utilized in the evaluation of the potential impacts of policy scenarios. As expected, the extent of utilization of the tools' features differ widely, depending on the need of the studies):

¹² It was mentioned by the relevant UNECE staff that this is a special case which required implementing the changes in the Vensim model itself.

Table 4. Features of ForFITS

Feature	Remarks
Ability to conduct analysis based on transport system type	ForFITS has been utilized to assess scenarios for urban and country-level systems
Ability to include different transport modes (nine modes)	The external applications mostly focused on urban transport modes, while the UNECE technical reports included the other modes (e.g. pipelines)
Ability to include 31 powertrain technologies	UNECE applications in Lithuania and Belarus; Zawieska and Pieriegud (2018)
Ability to include 10 fuel blends	Relevant to biofuels scenarios assessments
Ability to evaluate socio-economic growth scenarios	Examples are UNECE applications in Belarus and Lithuania
Ability to evaluate fuel cost scenarios	Example done in Grand Lyon.
Ability to evaluate fuel taxation policy	Zawieska and Pieriegud (2018); Warsaw, Poland
Ability to evaluate road pricing policies	
Ability to evaluate differentiated vehicle taxation	Example done in Lebanon
Ability to evaluate scenarios related to structural changes in the transport systems	Mode shift scenarios ("passenger transport indexes" are modified)
Ability to evaluate scenarios related to the evolution of cost and performance of vehicle technologies	Similar to the scenarios dealing with the powertrain technologies

82. The scenarios are translated into changes in the parameters in the ForFITS model such as vehicle kilometres travelled, average vehicle occupancies, vehicle efficiencies, emission factors, as well as changes to the passenger transport system index, transport characteristic index and the environmental culture index. These indexes have been made specifically for ForFITS in order for the tool to consider the effects of wider systemic changes brought about by behavioural change, for example, on vehicle ownership.
83. As funding ceased once the UNDA projects ended, the lack activities in relation to the continuous development of ForFITS, as well as activities that continuously develop the capacities of the stakeholders in the beneficiary countries may further contribute towards the declining engagement of such stakeholders.
84. In terms of whether the tool is still up-to-date and competitive with comparable modelling tools, 6 out of the 13 respondents suggest that updating is needed.

**Figure 5. Perceptions on ForFITS Being "Up-to-date" and Competitive**

85. There exist opportunities for the adoption of ForFITS for conducting emissions reduction policy analysis in other parts of the globe but were not put into fruition due to specific circumstances. For example, ForFITS was considered in a study to be done in Vietnam, but the responsible organization opted for another model as it is easier to adapt to the needs of the transportation ministry due to the availability of the model developer to assist in its application. Also, it has been mentioned that there have been instances that country representatives (particularly those from developed countries) stated that they have been using their own tools or tools that have been developed by other organizations for their specific needs.
86. The provision of special attention towards ForFITS in strengthening national capacities of countries in assessing the environmental performance of their transport sector is specifically mentioned in ECE/Trans/2016/28. The lack of UNECE-initiated activities relating to widescale capacity building, tool revision and tool dissemination during the 2014-2018 period, due to the limited resources available once the UNDA funding period expired, may have diminished the relevance of the tool as a primary resource for establishing transport emissions pathways and analysing policy options. Such is evidenced by the diminishing views of the webpages relevant to ForFITS as shown in Figure 6 below (quarterly views from the fourth quarter of 2013 to the third quarter of 2018).

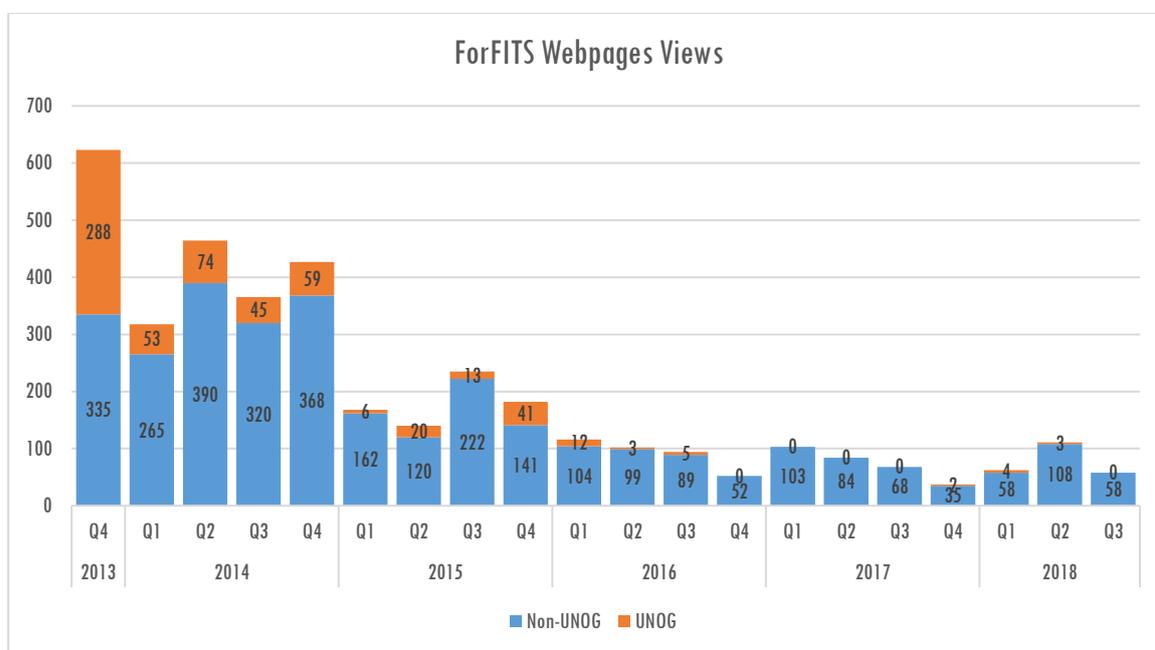


Figure 6. ForFITS Webpages Views

Source: Data provided by UNECE

87. The regional commissions were instrumental in the dissemination of the tool in the first phase of the project. A couple of external users stated via email that they were introduced to ForFITS through activities conducted by the UNECLAC and the UNESCWA. However, there seemed to be a lack of follow-up activities by the regional commissions on ForFITS-related activities. Information on activities utilizing ForFITS conducted in the different UN regional commissions were also sought. A response was received from the relevant representative in UNESCAP, but based on the representative's knowledge, there were no follow-up activities that were done after the regional seminar, and the national workshop that were held in Bangkok during the first phase of the project. There were no other responses that were provided by the other UN regional commissions. An external user who came to know about ForFITS through a training session organized by UNESCWA also wondered whether the ForFITS team stopped working on the development of ForFITS.
88. In terms of the long-term sustainability of ForFITS, the lack of resources after the UNDA-funded project has limited the further expansion of the application of ForFITS, its maintenance and

evolution. While a ForFITS work programme was developed (ECE/TRANS/2017/7), there were no specific plans embedded in the work programme on how funding is to be generated for supporting ForFITS. The long-term sustainability of such a tool is dependent on the continuous improvement and the creation of the demand for its usage.

89. Based on the provided information by the relevant UNECE staff, there were only two staff with specific but limited time allocation for ForFITS. As compared to other similar initiatives, the IEA, for example, has 4-6 staff dedicated to the development and maintenance of its MoMo, while the International Transport Forum (ITF) has 10 staff involved in modelling. It is recommended that the ITC considers increasing the internal budget for ForFITS (i.e. providing for one staff with significant time allocation towards ForFITS).

90. If resources remain constant, then the author would advise to focus on more specific issues, with a narrower scope, where such activities could add value to the wider transport and energy modelling community and benefit ForFITS and other modelling frameworks. Such issues could, for example, include:

- Emission factors database
- Monitoring used vehicle trade and environmental impacts
- Interactive tool for life cycle analysis

91. Figure 7 below shows the ratings for the considerations for the further development of the ForFITS tool based on the survey. The inclusion of co-benefits of implementing CO₂ mitigation measures in the sector was rated the highest, followed by the provision of accessible training materials (online course), and guidance provision on sourcing of localized inputs.

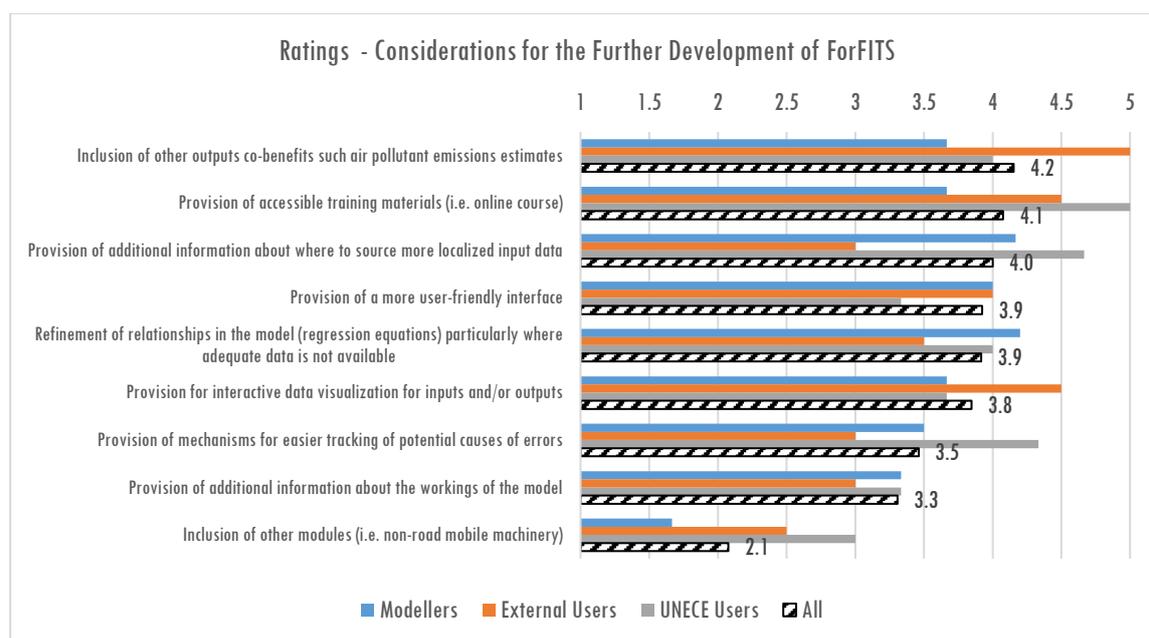


Figure 7. Considerations for Further Development of ForFITS (Average Ratings)

Note: The figure depicts a rating scale where 5 indicates the highest rating in terms of importance; Based on responses from: 6 modellers; 3 UNECE users; 4 external users

3.5. Impact

92. The impact of the project is rated as partially satisfactory.

93. In terms of policy impacts, the internal users of ForFITS mention that policy dialogues have been conducted through the analyses done through ForFITS and have supported the recommendations to government and has driven policy discussions such as in the case of the EPR applications, as one respondent states. A UNECE staff stated in the interview that the presence of the tool has enabled a more critical approach to be taken towards assessing transport policies, as demonstrated by the changes brought by ForFITS within the context of the EPR process. The ForFITS tool was essential in moving towards having a separate transport chapter in the EPRs and in providing much needed analyses for policy discussions. As mentioned earlier, ForFITS is also utilized in the “Transport, Health and Environment” (THE PEP). City conferences were being organized under THE PEP (called Relay Race Workshops) and these were then suggested to be avenues for disseminating ForFITS and resulted in further applications of ForFITS (Kaunas, Lithuania and Mannheim, Germany). The conversations with the UNECE staff imply that there is an internal view that the ForFITS tool is a useful tool for analysing GHG baselines and potential intervention impacts. This is corroborated by the fact that ForFITS is included in the Draft Strategic Frameworks of the UNECE Transport subprogramme (ECE/TRANS/2014/25; ECE/TRANS/2016/30) and has been integrated into the Programs of Work of the Transport subprogramme (ECE/TRANS/2016/28; ECE/TRANS/2016/30).
94. The “Policy Dialogue and Technical Assistance to Countries with Economies in Transition” (ECE/TRANS/2016/5) states that the insights from the implementation of ForFITS has largely contributed towards the development of the SafeFITS tool which is a tool that intends to facilitate knowledge based on transport policy decision making related to road casualty reduction.
95. In terms of the known direct policy developments arising from the external applications of ForFITS, in Lebanon, Dr. Mansour of the Lebanese American University mentions that their work with ForFITS (Haddad et al., 2017) has contributed towards the approval of policies on tax exemption of electric vehicles and tax reduction on hybrid vehicles. Both policies were approved in 2018 (Habre, 2018).¹³ Their study assessed the impacts of promoting electric and hybrid vehicles, as well as public transport modes. Their analysis also showed that simultaneous promotion of the measures can yield more benefits as compared to individual intervention promotion.
96. The application in Grand Lyon, France was also used in the confirmation process for the Territorial Climate Plan (*Plan climat énergie territorial - La Métropole de Lyon*) as revealed by Ms. Elise Raviche. Ex-post emissions impact assessments of these policies are not available as of the time of writing of this report.
97. In terms of the usage of ForFITS by other organizations, the evaluator has only found evidence of external usage as mentioned in Table 2. No direct evidence has been found on GHG emission reduction through policies that have been supported by the use ForFITS.

3.6. A Note on Gender Considerations

98. Based on the available information about the relevant external users of the tool during the period, women represented 31% of those who have been able to utilize ForFITS for publications. As mentioned earlier, while the identification of respondents considered efforts to find additional women respondents, the surveys were treated with gender neutrality as no critical differences arising from differences in gender were identified in terms of the use of the tool. In terms of the ForFITS-specific work plan (ECE/TRANS/2017/7) and recent concept notes,¹⁴ there were no specific statements mentioning how gender responsiveness will be integrated in the planned activities.

¹³ According to Dr. Mansour, electric vehicles used to have 50% tax based on the cost of the vehicle. Hybrid vehicle taxes were reduced to 20% from 50% of the vehicle cost.

¹⁴ “ForFITS tool for emissions reduction in transport” and “Strengthening the capacity of governments in all UN regions to reduce air pollution and Green-House-Gas (GHG) emissions from inland modes of transport”

CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

99. A summary of the main evaluation remarks for each of the main criteria is found in Table 5 below. Based on the evaluation, the objective of “assisting the UNECE Contracting Parties/ beneficiary countries in terms of the analytical work through the use of ForFITS towards supporting environmental assessments of their transport sector” has been achieved as evidenced by the technical outputs (i.e. country reports, EPRs, regional study) during the period, as well as the information gathered from the relevant stakeholders. These achievements have been produced even amidst the constraints in resources that were available during the 2014-2018 period (i.e. limited staff directly engaged in ForFITS, as well as limited extra-budgetary resources).
100. The intended improvements to the tool, as well as the conduct of training sessions were not fully implemented during the relevant period as these would have been done through extra-budgetary resources (as stated in ECE/TRANS/2016/30). However, it must be noted that work has been done in terms of developing proposals that were meant to support the further improvement of the tool, and the conduct capacity building activities in relation to ForFITS.

Table 5. Summary of Assessment

Criterion	Summary of Assessment
Relevance	<p>Rating: Satisfactory</p> <p>ForFITS, as a tool, is in line with UNECE’s overall goal of facilitating greater integration and cooperation and promoting sustainable development.</p> <p>ForFITS has been relevant to the implementation of the activities under cluster 8 of the UNECE Subprogramme on Transport: Transport, Health and Environment Pan-European Programme (THE PEP). It has also been highlighted in the Programme of Work 2016-2017 under “capacity building” functional area of the Transport subprogramme.</p> <p>ForFITS is strategically relevant in supporting the overall UN goal of addressing climate change.</p> <p>While the analytical work that has been conducted by UNECE using ForFITS has been relevant to the UNECE mandate as expressed in the Transport subprogramme Programs of Work, the lack of other activities – due to the lack of available resources - that would promote the use of the tool through capacity building and further development of the tool may have diminished the relevance of the tool.</p>
Effectiveness	<p>Rating: Partially Satisfactory</p> <p>The conduct of the UNECE analytical work has produced quality technical reports that aim at guiding policies for reducing carbon emissions in the beneficiary countries.</p> <p>ForFITS’ modelling capabilities, its free-of-charge nature, as well as it being a “UN tool” have been identified as its key strengths. The use of VENSIM as a modelling platform, while it has enabled UNECE to make the tool freely available to the public and ensures scientific rigour in the modelling process, has its drawbacks as it makes the use of the model complex. The assessment highlights the inability of the current tool to attract more users due to the relative complexity. The data requirements needed for the tool are also quite heavy, and significant time is required for using the tool considering the data collection data requirements.</p>

Criterion	Summary of Assessment
	<p>While the UNECE activities (e.g. analytical work and report development) have produced the intended accomplishments in terms of assisting in providing environmental assessments of the countries' transport sector (e.g. based on ECE/TRANS/2014/25), the activities during the evaluation period have been limited in terms of significantly building the capacities in the UNECE contracting parties in terms assessing the environmental performance of their transport sector using ForFITS (as per the UNECE ITC Strategic Frameworks), as the intended roll-out has not been fully achieved due to the lack of resources.</p>
Efficiency	<p>Rating: Satisfactory</p> <p>Evidence suggests that the UNECE staff provided sufficient and timely support for those external users that have asked for technical guidance in the use of the tool.</p> <p>However, it must also be noted that the relevant interviews point towards the fact that current manpower in supporting ForFITS is limited.</p>
Sustainability	<p>Rating: Partially satisfactory</p> <p>The intended uptake of the tool, as well as the planned revisions to the tool itself have not been achieved, primarily hindered by the lack of resources.</p> <p>In terms of the usage of the results of the tool, that the results of the analytical work have been used in policy discussions, but no detailed documentation of such linkages exist, except for the policies that were developed in Lebanon, and in Grand Lyon, France that utilized the results of the ForFITS application of external users. Aside from these, there have been no evidence of sustained use of the tool within the beneficiary countries.</p> <p>In terms of the usage of the tools' capabilities, the internal and external applications of ForFITS suggest that the different core features of ForFITS have been utilized but at varying levels, as expected.</p> <p>The views of the users and experts suggest that ForFITS is no longer up-to-date and competitive with comparable state-of-the-art modelling frameworks. The intended upgrades and improvements that have been cited in the various relevant documents have not yet been addressed, primarily due to the constraints brought about by the lack of resources. There are also indications that the engagement of stakeholders has not been sustained, again, due to the lack of dedicated resources and appropriate mechanisms for active engagement.</p>
Impact	<p>Rating: Partially Satisfactory</p> <p>In terms of policy impacts, the internal users of ForFITS mention that policy dialogues have been conducted using the analyses done through ForFITS and have supported the recommendations to government in policy dialogues.</p> <p>The ForFITS tool was essential in moving towards having a separate transport chapter in the EPRs and in providing much needed analyses for sector- specific policy discussions.</p> <p>As mentioned, the application of ForFITS by external users have been identified to have directly supported the passage of emissions abatement policies in Lebanon and in Grand Lyon, France. However, there have been</p>

Criterion	Summary of Assessment
	no evidence of other applications aside from the ones mentioned in this report.

4.2. Recommendations

101. The following recommendations are proposed based on the information and insights gathered from the evaluation process.

1. Revisit the desired roles of ForFITS within the purview of UNECE and define its targeted users

102. Strategic decisions in terms of the role of ForFITS within the purview of the UNECE need to be taken, particularly in terms of how it would like to sustainably utilize ForFITS to support environmental assessments (on-demand, or fully integrated) of the transport sector in the UNECE parties and how it may be integrated with other related efforts such in the complementing the efforts towards the development of capacities for generating high-quality transport statistics, as well as in supporting the measurement, reporting, and verification (MRV) of climate change mitigation in the transport sector. It must be noted though, that based on the evaluation, such a tool is deemed to still be relevant, and that there are opportunities for such to make significant impacts in terms of guiding sustainable transport policies in the beneficiary countries.

103. Clarity on the targeted users of ForFITS must also be attained and such is dependent on whether UNECE will aim for widespread dissemination of the tool. Widespread dissemination would probably entail significant modifications the tool itself, as well as increased efforts towards capacity building. Targeting expert organizations as direct users is also be an option, but such must be anchored on initiatives that would ensure that the outputs from the modelling are communicated to the right entities and are utilized in the relevant policy decision making processes. The finding of the evaluation point towards recommending that UNECE pursues widespread adoption so as to enable more stakeholders to engage in such policy assessment processes. Although in such a scenario, the importance of quality assurance and review processes must be highlighted.

2. Develop targeted “ForFITS activities” according to allocated resources for a more sustainable ForFITS programme

104. Moving forward with ForFITS would entail a comprehensive programme that needs to be composed of components aside from updating of the tool. Such a programme can be used towards attracting external funding.

105. For example, a regional project focusing on a specific carbon mitigation measure relevant for the beneficiary countries maybe proposed - in cooperation with accredited UN entities/ implementing agencies – to financing mechanisms such as the Global Environment Facility or the Green Climate Fund. The ForFITS tool can strategically be placed as the tool for initial assessment of the emissions baselines, as well as the potential impacts of the measure. It can also be used for assisting the “MRV” process of the emissions impacts (measurement, reporting, verification) of the intervention. The upgrading of the tool can be included as a component in the project. Current efforts to improve the transport statistics within the UNECE Contracting Parties can be leveraged, and the project may also contribute towards such efforts. Capacity building and stakeholder engagement activities such as the development of an online course, as well as the development of a platform for the community of users are also critical components of such a programme (see recommendations 8, 9, 10).

106. If resource allocation remains constant, then ForFITS should be oriented towards providing targeted niche applications into specific topics not covered by other transport and energy models to benefit the wider community (see para. 88). For example, building globally harmonized datasets

that could benefit a wider range of modelling framework would further improve the visibility and impact of ForFITS.

3. Improve the human and financial resources allocation and provide adequate support

107. As the evaluation reveals, there have been limited human and financial resources that have been provided to the second phase of ForFITS. While ForFITS has been engrained in the official documents of UNECE, the level of support has not been adequate to realize the improvements and dissemination efforts that were envisioned for ForFITS as explained in Section 3.4. Depending on the direction that UNECE would like to take ForFITS to, it must consider the appropriate support needed for moving towards such a direction. Tool maintenance, improvement, capacity building, and dissemination are activities that are critical in the success of such tools, and these need sufficient attention.

108. UNECE may also consider partnering with external parties in realizing the improvements that are envisioned for the tool. UNECE has partnered with several Universities in 2018 for various initiatives, and perhaps should consider exploring having a memorandum of understanding (MoU) with a premier educational institution or research centre in terms of the tool revision. Similar partnerships may be sought later on for the dissemination of the tool.

109. It is recommended that ForFITS still be included as a flagship initiative for resource mobilization in UNECE, and continued efforts to find support for the improvement of the tool and its dissemination be pursued (Informal Document No. 2018/6). More intensive efforts to reach out to new donors can be supported by targeting specific improvements to the tool and highlighting the existing advantages of the tool. For example, the development of an air pollution module, coupled with a cost-benefit module covering human health impact valuation may prove to be enticing, as the issue on air pollution and health is on the rise.

4. Adopt a new programming environment for the ForFITS model

110. If UNECE would like to pursue the accelerated adoption of ForFITS in the contracting parties/beneficiary countries in performing their own environmental assessments for the transport sector, significant modifications to the existing tool, as well as significant attention to supporting activities are required.

111. Based on the results of the evaluation, the current modality of using VENSIM + Excel for ForFITS, while such has initially enabled UNECE to produce a robust, accessible, and free-of-cost tool, may have also played a significant role in hindering the adoption of the beneficiary countries due to its complexity.

112. Open source programming environments such as R or Python may be viable option for ForFITS in the future. Such a program also allows for reproducible research to be conducted, as the codes are openly made available, which also makes tracking of potential errors easier. Reproducibility enhances replicability, and thus may entice further applications, as well as collaborative enhancements to the program itself. For example, system dynamic models have been developed through R (see Duggan, 2016). Such programs also allow for “literate programming” wherein a source file can be woven into a formatted presentation document, which makes report development less cumbersome. Moreover, these programming languages have highly active communities that constantly expands the capabilities of the programming environments. Cloud computing may also be used through such, which addresses the problem regarding limits imposed by computer memory. UNECE may seek to work with specific academic institutions as to how to migrate the formulas from the current ForFITS program into such environments.

113. Another suggestion is to explore the use of Microsoft Excel for ForFITS, as this is a platform that is most likely be understood by a lot of the target stakeholders in the beneficiary countries.

However, this would entail that the modelling capabilities of ForFITS be re-evaluated. The adoption of an Excel-only version of VENSIM assumes that simplification will be done, and details will be lost due to the more limited capabilities of spreadsheet models. Again, this is related to the issue of who would be the target end users of the tool.

5. Offer mode-specific or intervention-specific modules in the ForFITS model

114. In a scenario where UNECE decides to upgrade the ForFITS model, it should also consider offering simpler “mode-specific” or “intervention-specific” modules for evaluating specific policies - in essence, providing options for limiting the scope of analysis. Such may provide more timely analysis on potential impacts of policies that accounts local circumstances as opposed to system-based tools that are more difficult and time-consuming to implement. For example, the “Transport Emissions Evaluation Model for Projects” (TEEMP) tools have been developed to assess the CO₂ (and air pollutant) emissions impact potentials of different types of transportation projects, and these have been recommended to be used by proponents of transportation projects that are being proposed under the Global Environment Facility (GEF).

6. Develop a more user-friendly interface for the ForFITS model

115. Regardless of the programming environment that is to be chosen, an updated user interface that enables an easier input process, as well as the generation of customizable graphs, and perhaps the user-customization of equations should be considered in the future iterations of ForFITS. Powerful visualization (including interactive visualization) packages, as well as packages for developing web-based forms also exist for the Python or R programming languages.

116. In addition, one notable suggestion brought up by an interviewee is consider two versions of ForFITS: the full version, and a simplified or “sketch” model which would cater to non-modellers but who are involved in analytical work for supporting sustainable transport, and one which would cater to more advanced users. The simple version can be a web-based application with simple input forms coupled with interactive data visualization capabilities. As an example, ClimateWorks has produced the 2050pathways calculator that is meant for use by non-modellers who are interested in seeing the potential impacts of certain policies.¹⁵

7. Integrate co-benefits into the ForFITS model

117. Based on the results of the survey, the inclusion of other co-benefits into ForFITS garnered the highest average rating in terms of “priority areas” for the further development of the tool. However, it was noted by one of the UNECE staff members that the existing model currently has reached the limits of VENSIM, and that implementing an air pollution module would need to account for an extra layer that would accommodate the relevant vehicle characteristics (i.e. emission standards) and that the addition may not be able to be handled by the existing model, and thus this relate to the issue of migrating into another programming platform.

118. Aside from air pollutant emissions, perhaps UNECE may also consider the inclusion of short-lived climate pollutant (SLCPs) emissions estimation into the model. The transport sector is estimated to emit 19% of global black carbon emissions which both impact the climate, as well as human health (CCAC, n.d.).

119. It is also suggested that cost multipliers for translating externalities into monetary figures be added (e.g. USD/kg of specific air pollutants, for example) in order to make the communication of results more impactful. The inclusion of such may also open new funding opportunities for ForFITS.

¹⁵ <http://2050pathways.net.au/calculator>

8. Review and update the modelling relationships in the ForFITS model

120. There is also a need to review the relationships used in the model and update such if the existing data allows. UNECE may also want to investigate if there are other factors that might be estimated using commonly available data and improve the inner workings of the model before including additional modules.
121. Future iterations of such a tool should also consider how the emerging concepts such as automated vehicles, shared mobility, intelligent transport systems would impact the modelling process.

9. Develop an online platform for engaging the community of ForFITS users

122. The accelerated uptake of the such a tool is also dependent an active community of users by providing a platform for sharing of data by the users of the tool, as well as for posting inquiries, solutions and model enhancements, and information about other external sources of relevant data. UNECE should also share the assumptions and data used in the existing application of ForFITS. These would highly be useful for potential users who may not have easy access to specific data that are needed for running the tool. These data can also be used for estimating “default values” for certain parameters that maybe estimated using commonly available data.
123. While such a platform is being developed, a form for capturing information can be integrated into the download page in the ForFITS website as it would be a simple but effective way to know more about the current users and whom can later be invited to participate in the online platform.

10. Develop an on-line training course

124. Opportunities exist for enhancing country-level capacities in utilizing tools such as ForFITS through the development of a massive open online course (MooC). Such a course may include learning sessions on the underlying theories behind ForFITS, as well as the actual use of the tool itself. The provision of such online courses would be more cost effective than continuously conducting in-person trainings.
125. UNECE may also want to explore the idea of issuing certificates to the trainees that would be able to successfully finish the on-line course. This should also provide additional incentives for researchers to use the tool, as well as for other interested parties to know more about the tool and accelerate its promotion. Such a course should also take into consideration the development of modules that would go in-depth regarding the input data needed by the model.

11. Ensure that gender balance is considered in the planning, implementation, and monitoring of activities relating to ForFITS

126. Future planning, implementation, and monitoring of ForFITS’ activities should include gender considerations. The collection of users’ data should also include gender-splits, and gender balance should be aimed for future capacity building exercises. Moreover, the inclusion of co-benefits into the model may also inculcate considerations for interventions that would highly benefit transport-vulnerable groups including women.

12. Increase UNECE’s participation to key international fora on transport emissions/energy modelling

127. A key forum that UNECE may consider participating in is the International Transport Energy Modelling or ITEM (See <https://transportenergy.org/>). The group aims to better understand the data and methods applied to large scale models and improve the knowledge of the system through

dialogue. It might be a useful exercise for UNECE to participate in the discussions as to further guide its decision on how to move towards the future iteration of ForFITS. Participation in key relevant conferences and discussion groups (such as its participation in ITEM or the International Transport Energy Modelling events) may also provide additional boost in terms of making the tool relevant in the current period, and in promoting the tool in general (e.g. Better Air Quality Conference in Asia; Transport and Air Pollution Conference in Europe; Transport Research Board Conference in the United States; the International Transport Forum in Leipzig; as well as the Environmentally Sustainable Transport (EST) Forum being organized by the United Nations Centre for Regional Development).

ANNEXES

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2050 Calculator: <http://2050pathways.net.au/calculator>

6.2. Terms of Reference for the Evaluation



ECONOMIC COMMISSION FOR EUROPE

TERMS OF REFERENCE

Evaluation of the UNECE ITC support to governments in climate change mitigation: lessons from the use of ForFITS tool that links policy choices and CO₂ emission scenarios for inland transport

I. Purpose

The purpose of this evaluation is to review the support of UNECE ITC to member States on climate change mitigation, in particular through the For Future Inland Transport Systems (ForFITS) tool. This evaluation will assess the relevance, effectiveness, efficiency, sustainability and impact of the ForFITS tool in supporting member States to mitigate CO₂ emissions from the transport sector. The results of the evaluation are expected to provide a long-term vision for the further development of the tool in order to further strengthen its impact on policy recommendation, adoption and evaluation by the beneficiaries (at the national or metropolitan levels).

II. Scope

Following the first phase of the ForFITS tool development, an evaluation¹ to assess the development and post-implementation of the ForFITS tool was conducted at the end of 2013 and published in March 2014. The present evaluation will focus on the work done during the second phase of the project from 2014-2018, assessing how the ForFITS model has been used by internal and external stakeholders including the gender-split, where available. The contribution of the model results towards GHG emissions mitigation will also be assessed by the evaluator).

The evaluation should be gender responsive. It is expected that the evaluator will look into gender equality while delivering the assignment and provide some finding and recommendation.

III. Background

The transport sector is a major contributor to greenhouse gas (GHG) emissions, and mitigating the impact of GHG emissions continues to be a consideration in the development of government policies on transportation. The transport sector accounts for more than 20% of the CO₂ emissions from fuel combustion, and its share is expected to rise in the coming decades. Inland transport represents more than 75% of the CO₂ emissions of the transport sector (IEA World Energy balances, 2018). Mitigating GHG emissions has been set as a priority to achieve climate goals as defined by the Conferences of Parties (COP) process of the UNFCCC international negotiation framework from its inception in 1995.

Policies and technologies that mitigate GHG emissions from the transport sector can also bring significant benefits such as improvement in air quality, cost reductions and increased competitiveness. Quantifying GHG mitigation potential is key to delivering on climate goals and assessing policy impacts before and after their implementation. ForFITS aimed at providing a modelling framework to quantify the impact of transport policies on GHG emissions, and projecting future GHG emissions at the national or international levels.

The ForFITS tool was developed by the UNECE during 2011-2014 with the financial support of the United Nations Development Account (UNDA). The main aim of the tool is to enhance international cooperation and planning towards sustainable transport policies, with a particular ambition to facilitating climate change mitigation by quantifying CO₂ emissions for the whole transport sector. Seven pilot cases

¹

www.unece.org/fileadmin/DAM/trans/doc/themes/ForFITS/Evaluation_report_on_ForFITS_Project_DA_code_1011E_.pdf

in the UN Regional Commissions were assessed during the model development process, and ForFITS is currently available free of charge on the UNECE website.²

After the UNDA funding expired in 2014, ForFITS has been used in several national and local contexts, providing insights on GHG emissions mitigation potential for different sets of scenarios for the forthcoming decades up to 2030. The use of ForFITS is based on the Strategic Framework of the UNECE transport subprogramme for 2016/2017 (ECE/TRANS/2014/25) and 2018-2019 (ECE/TRANS/2016/30). ForFITS has been used as part of cross-sectoral activities within UNECE's Environmental Performance Reviews performed by the Environment Division with the support of Sustainable Transport Division staff. ForFITS has also been used in the context of Transport, Health and Environment Pan-European Programme (THE PEP), in a joint effort from the World Health Organization (WHO) Europe and UNECE's Environment and Sustainable Transport Divisions. In addition, the UNECE has provided support to external users of ForFITS from various universities and research institutions.

IV. Issues

The evaluation will answer the following questions:

Relevance

1. How relevant were the activities to the specific needs and priorities of the beneficiary countries/cities in the area of the GHG emissions mitigation?
2. To what extent were the activities related to the UNECE mandate as expressed in the programme of work?
3. To what extent were the activities consistent with global and regional priorities and the programme of work of the UN Regional Commissions?
4. To what extent were the activities intervention relevant for meeting the objective of the UNECE Subprogramme 2 "Transport" and beyond?
5. To what extent was the model understood and applied by the beneficiary countries as outlined by the model developed?

Effectiveness

6. To what extent were the expected accomplishments of the activities achieved?
7. What were the challenges/ obstacles to achieving the activities objective and expected accomplishments?

Efficiency

8. Did the activities achieve its objectives within the anticipated budget and allocation of resources?
9. Were the resources (financial and human) appropriate to the deployment of the tool?
10. Were the activities implemented according to the planned timeframe?
11. Was the support from the ForFITS Secretariat in providing modelling expertise sufficient?

Sustainability

12. To what extent have the results of the tool been used in the beneficiary countries?
13. How is the stakeholders' engagement likely to continue in the beneficiary countries?
14. Have all the tool capabilities been used by the beneficiary countries? If not all capabilities have been used, please provide a brief overview of how the tool has been used (what variables have been changed, which case-specific data have been used)?
15. Is the tool still up-to-date and competitive with comparable state-of-the-art modelling frameworks?
16. What would be the priority development areas to further improve the tool's capabilities?

Impact

² www.unece.org/trans/theme_forfits.html

17. Has ForFITS use and/or results led to new policies or policy changes in the beneficiary countries / cities?
18. Has the tool been applied by other international organization to perform their own projections?
19. Is there any evidence that GHG emission have been reduced thanks to the use of ForFITS?

V. Methodology

The evaluation will be conducted on the basis of:

1. A **desk review** of all the relevant documents obtained from ForFITS activities files including:

- Programmes and materials (presentations, background documents) developed for national and regional workshops as well as lists of participants;
- Project documents from the first and second phases, together with relevant evaluations conducted of the first phase
- Reports of workshops;
- Project webpage; and
- Modelling results and reports produced from the tool's output.

2. An electronic **questionnaire** will be developed by the consultant to assess the views of ForFITS users and developers, both internally and externally. Other stakeholders might be also be invited to answer the questionnaire in order to assess the perception of ForFITS from outsiders and expert that have no in-depth knowledge of the ForFITS tool. Potential names to be added to the list of interviewees would be provided by the UNECE project manager.

3. This questionnaire will be followed by **selected interviews** (methodology to be determined by the evaluator in consultation with UNECE). The interviews will take place via phone and Skype, or face-to-face when possible.

The report will summarize the findings, conclusions and recommendations of the evaluation. An executive summary (max. 2 pages) will summarize the methodology of the evaluation, key findings, conclusions and recommendations.

All material needed for the evaluation, will be provided to the consultant: ForFITS activities documents and reports, meeting reports and publications, list of involved experts that can be interviewed by telephone. UNECE will provide support and further explanation to the evaluator as needed.

The evaluation will be conducted in accordance with the UNECE Evaluation Policy.

VI. Evaluation Schedule

1. Launch of the evaluation (15 September 2018)
2. Desk review of all documents provided by UNECE to the evaluator (1 October 2018)
3. Delivery of inception report including design of survey (10 October 2018)
4. Feedback on inception report by the project manager (15 October 2018)
5. Launching the survey (20 October 2018)
6. Conducting in-person and telephone interviews (1 November – 10 November 2018)
7. Analysis of collected information (15 - 25 November 2018)
8. Draft report (30 November 2018)
9. Comments back to the evaluator after review by the project manager and the PMU (10 December 2018)
10. Final report (20 December 2018).

VII. Resources

An independent consultant will be engaged for a period of 30 days to conduct the evaluation, within a budget of USD\$ 10,000. Mr. François Cuenot, the project manager, will manage the evaluation in consultation with the Vehicle Regulation and Transport Innovation Section Chief, Mr. Walter Nissler. The Programme Management Unit (PMU) will provide guidance to the Project Manager and evaluator as needed on the evaluation design, methodology and quality assurance of the final draft report.

VIII. Intended use / Next steps

The evaluation results will be used in the planning and implementation of future evolutions of the ForFITS tool, to maximise its use and benefits towards climate change mitigation. Enlarging the scope of ForFITS beyond climate change might also represent an opportunity for future ForFITS applications. The outcomes of the evaluation will also contribute to the broader lessons learned of the post UNDA-funding and how UNDA projects can be sustained once the funds stop, and how to deploy long-term resources and mandate to similar projects.

IX. Criteria for Evaluators

Evaluators should have:

- an advanced university degree or equivalent background in relevant disciplines, with specialized training in areas such as evaluation, project management, social statistics, advanced statistical research and analysis.
- relevant professional experience in design and management of evaluation processes with multiple stakeholders, survey design and implementation, and project planning, monitoring and management.
- demonstrated methodological knowledge of evaluations, including quantitative and qualitative data collection and analysis for end-of-cycle project evaluations.

Evaluators should declare any conflict of interest to UNECE before embarking on an evaluation project, and at any point where such conflict occurs.

6.3. Evaluation Questions in Relation to the Desk Review and Surveys/Interviews

Questions	Desk Review	Survey and Interviews		
		External Users	UNECE ^a	Modelers
RELEVANCE				
1. How relevant were the activities to the specific needs and priorities of the beneficiary countries/cities in the area of GHG emissions mitigation?	Official documents containing information on GHG mitigation priorities (i.e. NDC); Transport GHG reduction policy databases	✓	✓	✓
2. To what extent were the activities related to the UNECE mandate as expressed in the programme of work?	UNECE Programme of Work (PoW)	✓	✓	
3. To what extent were the activities consistent with global and regional priorities and the programme of work of UN Regional Commissions	Relevant UN global and regional documents; Regional Commissions; PoW	✓	✓	✓
4. To what extent were the activities intervention relevant for meeting the objective of the UNECE Sub programme 2 "Transport" and beyond?	UNECE Transport sub-programme documents	✓	✓	
5. To what extent was the model understood and applied by the beneficiary countries as outlined by the model developed?	ForFITS technical guidance documents/ capacity building documents; email conversations	✓	✓	
EFFECTIVENESS				
6. To what extent were the expected accomplishments of the activities achieved?	Technical reports	✓	✓	
7. What were the challenges/obstacles to achieving the activities objective and expected accomplishments?	Technical documents relating to the applications of ForFITS; email conversations	✓	✓	
EFFICIENCY				
8. Did the activities achieve their objectives within the anticipated budget and allocation of resources?	Based on information given by UNECE	✓	✓	
9. Were the resources (financial and human) appropriate to the deployment of the tool?	Survey and interviews	✓	✓	
10. Were the activities implemented according to the planned timeframe?	Based on the review of email correspondences (e.g. in terms of responding to inquiries)	✓	✓	
11. Was the support from the ForFITS Secretariat in providing modelling expertise sufficient	Email conversations	✓	✓	
SUSTAINABILITY				
12. To what extent have the results of the tool been used in the beneficiary countries?	ForFITS application reports; external reports that focus on the beneficiary countries	✓	✓	
13. How is the stakeholders' engagement likely to continue in the beneficiary countries?	Website visits data	✓	✓	
14. Have all the tool capabilities been used by the beneficiary countries? If not, all capabilities have been used, please provide a brief overview of how the tool has been used (what variables have been changed, which case-specific data have been used)?	Technical guidance documents; reports of the ForFITS applications	✓	✓	
15. Is the tool still up-to-date and competitive with comparable state-of-the-art modelling frameworks?	Studies containing comparative analyses of similar GHG calculation models	✓	✓	✓
16. What would be the priority development areas to further improve the tool's capabilities?	ForFITS users' manual; ForFITS model itself.	✓	✓	✓
IMPACT				
17. Has ForFITS use and/or results led to new policies or policy changes in the beneficiary countries / cities?	Web searches (news, publications)	✓	✓	
18. Has the tool been applied by other international organizations to perform their own projections?	External reports; published studies	✓	✓	✓
19. Is there any evidence that GHG emission have been reduced thanks to the use of ForFITS?	GHG estimation studies relating to the policies, if available.	✓	✓	

6.4. Documents Reviewed for the Inception Report

1. Terms of Reference
2. UNECE Documents
 - UNECE Evaluation Policy
 - Use and further development of the For Future Inland Transport Systems (ForFITS) tool
 - Draft programme of work of the Transport subprogramme for 2018-2019
 - Draft Programme of Work of the Transport subprogramme for 2016-2017
 - Draft Strategic framework for 2018-2019
 - Draft Strategic framework for 2020-2021
 - UNECE Sustainable Transport Division Annual Report 2017
 - 2016 Draft Annual Report Sustainable Transport Division of the United Nations Economic Commission for Europe
 - 2015 Annual Report UNECE Inland Transport Committee
 - 2014 – The year of a new level of UNECE transport policy dialogue for sustainable development
 - Report of the Inland Transport Committee on its seventy-eighth session
 - Draft Annual Report of activities undertaken by the Inland Transport Committee's subsidiary bodies in 2014
 - Biennial evaluation of Transport subprogramme Programme performance assessment for 2014–2015
 - Sustainable Transport in the 2030 Agenda and the Sustainable Development Goals
 - Policy dialogue and technical assistance to countries with economies in transition
 - Environmental performance reviews
 - For Future Inland Transport Systems (ForFITS): A new tool for the implementation of the Paris Declaration
 - UNECE Resource Mobilization Strategy
3. Technical Reports: ForFITS Applications
 - Results of the Future Inland Transport Systems (ForFITS) Tool (Albania)
 - Results of the Future Inland Transport Systems (ForFITS) Tool (Belarus)
 - Projecting Future CO₂ Emissions Using the For Future Inland Transport Systems (ForFITS) Tool: The Case of Lithuania
 - Modélisation globale des émissions de CO₂ liées aux déplacements dans le Grand Lyon
 - Results of the Future Inland Transport Systems (ForFITS) Tool (Mannheim)
4. Phase 1 Evaluation Report (Project 10/11E: Facilitating Climate Change adaptation in transport through addressing the energy-environment linkage)
5. Documentation of Email Conversations
 - Jonathan Gomez Vilchez & Miguel Gangonells (2014)
 - Esther Menezes & Nathan Menton (2014)
 - Marco Trombetti & Nathan Menton (2015)
 - Jakub Zawieska, Miquel Gangonells & Nathan Menton (2015)
 - Esther Menezes & Nathan Menton (2016)
 - Jakub Zawieska & Nathan Menton (2016)
6. Project Webpage
 - ForFITS Guidance Documents
 - User Manual
 1. General description
 2. VENSIM Package Model file
 3. Description of the views (partial)
 4. Excel interface
 5. Using ForFITS
 - ForFITS excel and VENSIM files
 - ForFITS Capacity Building Documents (presentations)
7. Other external documents
 - ForFITS: A New Help in Transport Decision Making for a Sustainable Future

- The Long-Term Forecast of Land Passenger Transport Related CO₂ Emission and Energy Use in Hungary
 - Energy Use and Emissions Impacts from Car Technologies Market Scenarios: A Multi-Country System Dynamics Model
 - Overview and comparative analysis of emission calculators for inland shipping
 - Smart city as a tool for sustainable mobility and transport decarbonisation
 - Effectiveness of low-carbon development strategies: Evaluation of policy scenarios for the urban transport sector in a Brazilian megacity
 - Future Trends and Mitigation Options for Energy Consumption and Greenhouse Gas Emissions in a Developing Country of the Middle East Region: A Case Study of Lebanon's Road Transport Sector
 - Nationally determined contribution submissions to the UNFCCC by the UNECE member states
8. Other UN Documents
- Guidelines for gender-inclusive language
 - Guidance Document Integrating Human Rights and Gender Equality in Evaluations
9. List of Users, Modellers and Former Managers (provided by the UNECE Project Manager)

Pertinent details of the reviewed documents are found in Annex 8.3.

6.5. List of Persons Targeted for the Survey

Name	Company/Country
EXTERNAL USERS	
Maxim Britvin	Researcher Moscow state University of railway engineering
Elise Ravache*	Intern GRAND LYON DGDU - Service Déplacements
Charbel Mansour*	Assistant Professor, Department of Industrial and Mechanical Engineering, LEBANESE AMERICAN UNIVERSITY.
Zlatko Nikoloski	Research Fellow LSE Social Policy
Jonathan Gomez Vilchez	PhD student at KIT (Karlsruhe, Germany)
Esther Menezes	Agencia Metropolitana de Campinas
Marco Trombetti	European Commission Joint Research Center
Jakub Zawieska*	Road and Bridge Research Institute (IBDIM) (Warsaw)
Tamás Andrejszki	Budapest University of Technology and Economics
Mitja Šimenc	Vienna University of Economics and Business
Simon Commander	Altura Partners, IE Business School and IZA
Rachel de Silva	Universidade de São Paulo
Katarzyna Bebkiewicz	Institute of Environmental Protection – National Research Institute in Warsaw
UNECE USERS	
Antoine Nunes	UNECE / Environment division
Georgios Georgiadis*	UNECE / Transport division
Francesco Dionori	UNECE / Transport division
Konstantinos ALEXOPOULOS	UNECE / Transport division
INTERNATIONAL EXPERTS/MODELERS	
Alexander Koerner*	UNEP
Lew Fulton	UC Davis
Andreas Schaffer	UC London
Daniel Bongardt*	GIZ
Urda Eichorst	GIZ
Francois Cuenot*	UNECE
Nathan Menton*	UNECE
Jacob Teter*	IEA
Sudhir Gota*	Independent
FORMER PROJECT MANAGERS	
Pierpaolo Cazzola*	IEA
Miquel Gangonells*	INSEAD

* Indicate those that have responded to the survey and/or were interviewed.

6.6. Survey Questionnaires

6.3.1. External Users

Survey for External Users: ForFITS

This survey is being conducted as part of the evaluation of the second phase of the "For Future Inland Transport Systems" (ForFITS) project of the United Nations Economic Commission for Europe (UNECE).

The evaluation aims to review the support of UNECE Inland Transport Committee (UNECE ITC) to its member States through the ForFITS tool. An assessment of the relevance, effectiveness, efficiency, sustainability and impact of the ForFITS tool in supporting member States in mitigating CO₂ emissions from the transport sector is part of the said evaluation.

This survey aims to gather insights from external users of ForFITS. The results of this survey, combined with insights from the review of documents, and selected interviews will feed into the development of a long-term vision for enhancing the tool towards better supporting UNECE member States.

The survey will take between 15 to 20 minutes to complete. We appreciate your support, and we thank you in advance.

ABOUT YOU

Kindly tell us a bit about yourself. If you wish to be anonymous, kindly leave the optional fields blank (e.g. name, organisation).

Name	<input type="text"/>
Current Organization	<input type="text"/>
Gender <small>* must provide value</small>	<input type="text" value="Custom"/>
Which gender do you identify with?	<input type="text"/>
Is your current organisation the same one you belonged to when you used ForFITS? <small>* must provide value</small>	<input type="radio"/> Yes <input type="radio"/> No <small>reset</small>
Country/ies or City/ies that you applied ForFITS to <small>* must provide value</small>	<input type="text"/>

ABOUT YOUR CHOICE : FORFITS

<https://edcap.sydney.edu.au/surveys/?s=CLY7RA99JX> 1/7

22/01/2019 Survey for External Users: ForFITS

How did you know about ForFITS?
 * must provide value

- Through the capacity building activities conducted by UNECE
- UNECE Website
- Referred by a colleague
- Other channels

reset

Please indicate the importance of the following aspects towards your choice in using ForFITS for your study (please choose one for statement).

	Not important		Important		Highly important
ForFITS is free and accessible * must provide value	<input type="radio"/>				
					reset
ForFITS' scope (i.e. modes covered, scale of analysis) * must provide value	<input type="radio"/>				
					reset
ForFITS' main inputs are available in my country/city * must provide value	<input type="radio"/>				
					reset
Availability of suitable default values in case local data is not available * must provide value	<input type="radio"/>				
					reset
ForFITS' capabilities are adequate for generating suitable outputs for the study * must provide value	<input type="radio"/>				
					reset
User interface of ForFITS * must provide value	<input type="radio"/>				
					reset
Availability of information on how to access help/support * must provide value	<input type="radio"/>				
					reset
I have prior knowledge of ForFITS programming language Vensim * must provide value	<input type="radio"/>				
					reset

Kindly indicate other "highly significant" factors that you considered in choosing ForFITS (if any).

Expand

USING FORFITS

Kindly indicate your level of agreement with the following statements. Choose one per line.

<https://hedcap.sydney.edu.au/surveys/?s=CLY7RA99JX> 2/7

22/01/2019		Survey for External Users: ForFITS				
	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	
The actual resources needed in using ForFITS met my original expectations <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
ForFITS met my initial requirements in terms of the scope of what can be analysed by the tool <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The data inputs needed were in line with my expectations <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The modelling capabilities of the ForFITS allowed me to produce outputs as per my expectations <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The use of VENSIM as a programming tool for ForFITS is appropriate. <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
ForFITS is still up-to-date and competitive with other comparable tools <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The support from the ForFITS team was adequate and appropriate (please leave blank if not applicable)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Did you use country or case-specific data for your study? Kindly list down the variables, if any.	<div style="border: 1px solid black; height: 60px;"></div>					Expand
Please identify up to three (3) aspects of using ForFITS that you like the most.	<div style="border: 1px solid black; height: 60px;"></div>					Expand

22/01/2019 Survey for External Users: ForFITS

Please identify up to three (3) aspects of using ForFITS that you think needs the most improvement.

Expand

Kindly elaborate your answer regarding the use of VENSIM for ForFITS.

Expand

USAGE OF FORFITS' FEATURES

In your experience in using ForFITS, have you been able to utilize the following features of the tool?

	I did not need to use this feature	I have utilised this feature to some extent	I have fully utilised this feature
Ability to conduct analysis based on transport system type (urban, non-urban) <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>			
Ability to include different transport modes (nine modes) <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>			
Ability to include 31 powertrain technologies <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>			
Ability to include 10 fuel blends <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>			
Ability to evaluate socio-economic growth scenarios <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>			
Ability to evaluate fuel cost scenarios <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>			
Ability to evaluate fuel taxation policy <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>			
Ability to evaluate road pricing policies <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>			
Ability to evaluate differentiated vehicle taxation <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>			

<https://hedcap.sydney.edu.au/surveys/?s=CLY7RA99JX> 4/7

22/01/2019Survey for External Users: ForFITS

Ability to evaluate scenarios related to structural changes in the transport systems
* must provide value

reset

Ability to evaluate scenarios related to the evolution of cost and performance of vehicle technologies
* must provide value

reset

This space is provided for insights that you might have regarding the question above. Please provide explanations, when appropriate.

Expand

FORFITS IN SUPPORT OF CLIMATE CHANGE MITIGATION

How would you rate the suitability of ForFITS in supporting transport emissions mitigation policies in terms of the following. In case you are unsure, please leave them blank.

	Not suitable				Highly suitable
Innovative vehicle technologies	<input type="radio"/>				
					reset
Sustainable biofuels	<input type="radio"/>				
					reset
Intelligent transport systems	<input type="radio"/>				
					reset
Consumer information (such as campaigns for eco-driving*, use of public transport and modal transport etc.)	<input type="radio"/>				
					reset
Legal instruments (such as tax incentives for low carbon products and processes, taxation of CO₂ intensive products and processes, etc.)	<input type="radio"/>				
					reset
Urban mobility measures	<input type="radio"/>				
					reset

This space is provided for insights that you might have regarding the question above. Please provide explanations, when appropriate.

Expand

IMPACTS OF FORFITS

<https://redcap.sydney.edu.au/surveys/?s=CLY7RA99JX>
5/7

22/01/2019 Survey for External Users: ForFITS

Have the results of your study been used in policy discussions in the target country/city? Yes
 No

* must provide value [reset](#)

FURTHER DEVELOPMENT OF FORFITS

Further improvements for ForFITS are to be considered in the future, including new features. Kindly indicate the importance of the following aspects:

	Not important		Important		Highly important
Provision of additional information about the workings of the model <small>* must provide value</small>	<input type="radio"/>				
Provision of additional information about where to source more localized input data <small>* must provide value</small>	<input type="radio"/>				
Provision of a more user-friendly interface <small>* must provide value</small>	<input type="radio"/>				
Provision for interactive data visualization for inputs and/or outputs <small>* must provide value</small>	<input type="radio"/>				
Provision of mechanisms for easier tracking of potential causes of errors <small>* must provide value</small>	<input type="radio"/>				
Inclusion of other outputs co-benefits such air pollutant emissions estimates <small>* must provide value</small>	<input type="radio"/>				
Refinement of relationships in the model (regression equations) particularly where adequate data is not available <small>* must provide value</small>	<input type="radio"/>				
Inclusion of other modules (i.e. non-road mobile machinery) <small>* must provide value</small>	<input type="radio"/>				
Provision of accessible training materials (i.e. online course) <small>* must provide value</small>	<input type="radio"/>				

<https://redcap.sydney.edu.au/surveys/?s=CLY7RA99JX> 6/7

22/01/2019 Survey for External Users: ForFITS

Kindly indicate other features that you think would be useful to consider in further developing ForFITS

Expand

Will you be using ForFITS in similar studies in the future?

Yes
 No

reset

Will you be recommending ForFITS to other colleagues?

Yes
 No

reset

WILLINGNESS TO PARTICIPATE : INTERVIEW

In case the need to clarify some of your answers in the survey, are you willing to be interviewed by the evaluator?

Yes
 No

* must provide value

reset

Kindly provide your skype ID and/or your phone number and your preferred date and time (with time zone) for the interview (30 mins maximum).

* must provide value

Expand

Thank you very much.

<https://hedcap.sydney.edu.au/surveys/?s=CLY7RA99JX>

7/7

6.3.2. Modellers

ForFITS : Insights from Transport Emissions Modellers and Experts

This survey is being conducted as part of the evaluation of the second phase of the "For Future Inland Transport Systems" (ForFITS) project of the United Nations Economic Commission for Europe (UNECE).

The evaluation aims to review the support of UNECE Inland Transport Committee (UNECE ITC) to its member States through the ForFITS tool. An assessment of the relevance, effectiveness, efficiency, sustainability and impact of the ForFITS tool in supporting member States in mitigating CO₂ emissions from the transport sector is part of the said evaluation.

This survey specific survey targets modellers or experts who have prior knowledge of ForFITS. The survey aims to elicit insights and impressions regarding ForFITS, and how it may be improved.

The survey will take between 15 to 20 minutes to complete. We appreciate your support, and we thank you in advance.

ABOUT YOU

Kindly tell us a bit about yourself. If you wish to be anonymous, kindly leave the optional fields blank (e.g. name, organisation).

Name	<input type="text"/>
Gender <small>* must provide value</small>	<input type="text" value=""/>
Country of current residence <small>* must provide value</small>	<input type="text"/>
Organization	<input type="text"/>
Position in Organization	<input type="text"/>
How can you best describe your knowledge about ForFITS <small>* must provide value</small>	<input type="radio"/> I have fully utilized it for a study (published) <input type="radio"/> I have fully utilized it for an unpublished study <input type="radio"/> I have reviewed it as part of a published study <input type="radio"/> I have reviewed it informally

[reset](#)

<https://redcap.sydney.edu.au/surveys/?s=BKFNCLMTP8>
1/5

22/01/2019 ForFITS : Insights from Transport Emissions Modellers and Experts

How did you know about ForFITS?
 * must provide value

- Through the capacity building activities conducted by UNECE
- UNECE Website
- Referred by a colleague
- Other channels

reset

IMPRESSIONS ABOUT USING FORFITS

Based on your knowledge about ForFITS, kindly indicate your level of agreement with the following statements. Choose one per line.

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
The resources needed in using ForFITS are reasonable in relation to the outputs that it produces	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
reset					
The scope of analysis that can be done through ForFITS is suitable for addressing the transport emissions modelling-related needs considering in-land transportation in the UNECE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
reset					
The ForFITS tool's default data appropriately accounts for the levels of data availability in the UNECE member states	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
reset					
The modelling capabilities of ForFITS as a tool are appropriate in addressing the transport emissions modeling-related needs within the UNECE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
reset					
The available information regarding the use of ForFITS is sufficient for properly guiding intended users.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
reset					
The use of VENSIM as a programming tool for ForFITS is appropriate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
reset					
ForFITS is still up-to-date and competitive with other comparable tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
reset					

<https://redcap.sydney.edu.au/surveys/?s=BKFNCLMTP8> 2/5

22/01/2019

ForFITS : Insights from Transport Emissions Modellers and Experts

What do you think are the key strengths of ForFITS?

Expand

What do you think are the key challenges in using ForFITS?

Expand

Kindly elaborate your answer regarding the use of VENSIM for ForFITS.

Expand

FORFITS IN SUPPORT OF MITIGATION WITHIN THE UNECE

Based on your knowledge about ForFITS, how would you rate its suitability of ForFITS in supporting transport emissions mitigation policies in terms of the following. In case you are unsure, please leave them blank.

	Not suitable			Highly suitable		
Innovative vehicle technologies	<input type="radio"/>	reset				
Sustainable biofuels	<input type="radio"/>	reset				
Intelligent transport systems	<input type="radio"/>	reset				
Consumer information (campaigns for eco-driving*, use of public transport and modal transport etc.)	<input type="radio"/>	reset				
Legal instruments (such as tax incentives for low carbon products and processes, taxation of CO₂ intensive products and processes, etc.)	<input type="radio"/>	reset				
Urban mobility measures	<input type="radio"/>	reset				

FURTHER DEVELOPMENT OF FORFITS

Further improvements for ForFITS are to be considered in the future, including new features. Kindly indicate the importance of the following aspects:

<https://redcap.sydney.edu.au/surveys/?s=BKFNCLMTP8>

3/5

22/01/2019 ForFITS : Insights from Transport Emissions Modellers and Experts

	Not important		Important		Highly important
Provision of additional information about the workings of the model	<input type="radio"/>				
	reset				
Provision of additional information about where to source more localized input data	<input type="radio"/>				
	reset				
Provision of a more user-friendly interface	<input type="radio"/>				
	reset				
Provision for interactive data visualization for inputs and/or outputs	<input type="radio"/>				
	reset				
Provision of mechanisms for easier tracking of potential causes of errors	<input type="radio"/>				
	reset				
Inclusion of other outputs co-benefits such air pollutant emissions estimates	<input type="radio"/>				
	reset				
Refinement of relationships in the model (regression equations) particularly where adequate data is not available	<input type="radio"/>				
	reset				
Inclusion of other modules (i.e. non-road mobile machinery)	<input type="radio"/>				
	reset				
Provision of accessible training materials (i.e. online course)	<input type="radio"/>				
	reset				
Kindly indicate other features that you need think would be useful to consider in further developing ForFITS					Expand
What do you think are the characteristics of such transport emission models that are becoming more important?					Expand

WILLINGNESS TO PARTICIPATE : INTERVIEW

<https://redcap.sydney.edu.au/surveys/?s=BKFNCLMTP8> 4/5

22/01/2019 ForFITS : Insights from Transport Emissions Modellers and Experts

In case the need to clarify some of your answers in the survey, are you willing to be interviewed by the evaluator? Yes No reset

* must provide value

Kindly provide your skype ID and/or your phone number and your preferred date and time (with time zone) for the interview (30 mins maximum).

Expand

Thank you very much.

<https://redcap.sydney.edu.au/surveys/?s=8KFNCLMTP8> 5/5

6.3.3. UNECE Users/Staff

Survey for Relevant UNECE Staff : ForFITS (2014-2018)

This survey is being conducted as part of the evaluation of the second phase of the "For Future Inland Transport Systems" (ForFITS) project of the United Nations Economic Commission for Europe (UNECE).

The evaluation aims to review the support of UNECE Inland Transport Committee (UNECE ITC) to its member States through the ForFITS tool. An assessment of the relevance, effectiveness, efficiency, sustainability and impact of the ForFITS tool in supporting member States in mitigating CO₂ emissions from the transport sector is part of the said evaluation.

This survey aims to gather insights from current and past UNECE staff (technical, and management) regarding the ForFITS tool, and the associated activities and applications that have been conducted in relation to it, particularly between the period 2014-2018.

The results of this survey, combined with insights from the review of documents, and selected interviews will feed into the development of a long-term vision for enhancing the tool towards better supporting UNECE member States.

The survey will take between 10 to 15 minutes to complete. We appreciate your support, and we thank you in advance.

ABOUT YOU

Kindly tell us a bit about yourself. If you wish to be anonymous, kindly leave the optional fields blank (e.g. name, organisation).

Name	<input type="text"/>
Current Organization	<input type="text"/>
Gender <small>* must provide value</small>	<input type="text" value="v"/>
How would you characterize your involvement in the ForFITS initiative? <small>* must provide value</small>	<input type="radio"/> I have technical knowledge about the tool <input type="radio"/> I was involved in the management <input checked="" type="radio"/> Both 1 and 2
Which of the following did your ForFITS application/s contribute to? (You can choose more than one option) <small>* must provide value</small>	<input type="checkbox"/> UNECE Environmental Performance Reviews <input type="checkbox"/> Transport, Health and Environment Pan-European Programme (THE PEP) <input type="checkbox"/> Policy reviews in UNECE member states <input type="checkbox"/> Other

<https://hedcap.sydney.edu.au/surveys/?s=CDL99Y4YYL>
1/8

22/01/2019 Survey for Relevant UNECE Staff : ForFITS (2014-2018)

USING FORFITS

Kindly indicate your level of agreement with the following statements. Choose one per line.

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	
The resources needed in using ForFITS are reasonable in relation to the outputs that it produces <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The scope of analysis that can be done through ForFITS is suitable for addressing the transport emissions modelling-related needs considering in-land transportation in the UNECE <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The ForFITS tool's default data appropriately accounts for the levels of data availability in the UNECE member states <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The modelling capabilities of ForFITS as a tool are appropriate in addressing the transport emissions modeling-related needs within the UNECE <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The available information regarding the use of ForFITS is sufficient for properly guiding intended users. <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The use of VENSIM as a programming tool for ForFITS is appropriate. <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
ForFITS is still up-to-date and competitive with other comparable tools <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
This space is provided for insights that you might have regarding the question above. Please provide explanations, when appropriate.	<div style="border: 1px solid black; width: 100%; height: 60px;"></div>					Expand

<https://redcap.sydney.edu.au/surveys/?s=CDL99Y4YYL> 2/8

22/01/2019 Survey for Relevant UNECE Staff : ForFITS (2014-2018)

Kindly elaborate your answer regarding the use of VENSIM for ForFITS.

Expand

YOUR THOUGHTS ON FORFITS

Please identify up to three (3) aspects of using ForFITS that you like the most.

Expand

Please identify up to three (3) aspects of using ForFITS that you think needs the most improvement.

Expand

FORFITS APPLICATIONS WITHIN THE CONTEXT OF THE UNECE

Kindly indicate your thoughts regarding the utilization of ForFITS within the UNECE.

(One selection allowed per column)	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
ForFITS has adequately been used in carrying out policy reviews for the member States <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>					
ForFITS has adequately been used in assessing the environmental performance of transport in the Member States and the region in general <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>					
ForFITS has adequately been used in developing policy options for sustainable urban mobility <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<small>reset</small>					

This space is provided for insights that you might have regarding the question above. Please provide explanations, when appropriate.

Expand

<https://hedcap.sydney.edu.au/surveys/?s=CDL99Y4YYL>
3/8

22/01/2019 Survey for Relevant UNECE Staff : ForFITS (2014-2018)

USAGE OF FORFITS' FEATURES

In your experience in using ForFITS, have you been able to utilize the following features of the tool?

	I did not need to use this feature	I have utilised this feature to some extent	I have fully utilised this feature	
Ability to conduct analysis based on transport system type (urban, non-urban) <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to include different transport modes (nine modes) <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to include 31 powertrain technologies <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to include 10 fuel blends <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to evaluate socio-economic growth scenarios <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to evaluate fuel cost scenarios <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to evaluate fuel taxation policy <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to evaluate road pricing policies <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to evaluate differentiated vehicle taxation <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to evaluate scenarios related to structural changes in the transport systems <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Ability to evaluate scenarios related to the evolution of cost and performance of vehicle technologies <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset

<https://hedcap.sydney.edu.au/surveys/?s=CDL99Y4YYL> 4/8

22/01/2019 Survey for Relevant UNECE Staff : ForFITS (2014-2018)

This space is provided for insights that you might have regarding the question above. Please provide explanations, when appropriate.

Expand

FORFITS IN SUPPORT OF MITIGATION WITHIN THE UNECE

How would you rate the suitability of ForFITS in supporting transport emissions mitigation policies in terms of the following. In case you are unsure, please leave them blank.

	Not suitable				Highly suitable
Innovative vehicle technologies	<input type="radio"/>				
					reset
Sustainable biofuels	<input type="radio"/>				
					reset
Intelligent transport systems	<input type="radio"/>				
					reset
Consumer information (campaigns for eco-driving*, use of public transport and modal transport etc.)	<input type="radio"/>				
					reset
Legal instruments (uch as tax incentives for low carbon products and processes, taxation of CO2 intensive products and processes, etc.)	<input type="radio"/>				
					reset
Urban mobility	<input type="radio"/>				
					reset

This space is provided for insights that you might have regarding the question above. Please provide explanations, when appropriate.

Expand

IMPACTS OF FORFITS

Are you aware of policy discussions that have resulted partially due to the results of ForFITS applications?

* must provide value

Yes No reset

UNECE ON FORFITS

Kindly indicate your thoughts regarding the following statements.

<https://redcap.sydney.edu.au/surveys/?s=CDL99Y4YYL> 5/8

22/01/2019 Survey for Relevant UNECE Staff : ForFITS (2014-2018)

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree				
<p>The financial allocated to the deployment of the tool (2014-2018) were appropriate * must provide value</p> <p style="text-align: right;">reset</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
<p>The human resources allocated to the deployment of the tool (2014-2018) were appropriate. * must provide value</p> <p style="text-align: right;">reset</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
<p>The integration of ForFITS in relevant processes within UNECE is appropriate * must provide value</p> <p style="text-align: right;">reset</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
<p>This space is provided for insights that you might have regarding the question above. Please provide explanations, when appropriate.</p> <div style="border: 1px solid gray; height: 60px; width: 100%;"></div> <p style="text-align: right;">Expand</p>									
<p>What were the key management-related challenges that you encountered in relation to the roll-out of ForFITS?</p> <div style="border: 1px solid gray; height: 60px; width: 100%;"></div> <p style="text-align: right;">Expand</p>									
<p>Do you think that the level of integration of ForFITS in the activities of UNECE is adequate, or do you think that there is a lot of potential for further integrating ForFITS?</p> <div style="border: 1px solid gray; height: 60px; width: 100%;"></div> <p style="text-align: right;">Expand</p>									
<p>What suggestions do you have in terms of maximizing the usage and impacts of ForFITS within UNECE?</p> <div style="border: 1px solid gray; height: 60px; width: 100%;"></div> <p style="text-align: right;">Expand</p>									
<p>FURTHER DEVELOPMENT OF FORFITS</p> <p>Further improvements for ForFITS are to be considered in the future, including new features. Kindly indicate the importance of the following aspects:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%; text-align: center;">Not important</td> <td style="width: 33%; text-align: center;">Important</td> <td style="width: 33%; text-align: center;">Highly important</td> </tr> </table>							Not important	Important	Highly important
	Not important	Important	Highly important						

<https://hedcap.sydney.edu.au/surveys/?s=CDL99Y4YYL> 6/8

22/01/2019 Survey for Relevant UNECE Staff : ForFITS (2014-2018)

Provision of additional information about the workings of the model <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<small>reset</small>
Provision of additional information about where to source more localized input data <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<small>reset</small>
Provision of a more user-friendly interface <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<small>reset</small>
Provision for interactive data visualization for inputs and/or outputs <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<small>reset</small>
Provision of mechanisms for easier tracking of potential causes of errors <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<small>reset</small>
Inclusion of other outputs co-benefits such air pollutant emissions estimates <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<small>reset</small>
Refinement of relationships in the model (regression equations) particularly where adequate data is not available <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<small>reset</small>
Inclusion of other modules (i.e. non-road mobile machinery) <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<small>reset</small>
Provision of accessible training materials (i.e. online course) <small>* must provide value</small>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<small>reset</small>
Kindly indicate other features that you need think would be useful to consider in further developing ForFITS	<div style="border: 1px solid #ccc; width: 100%; height: 60px; margin-bottom: 5px;"></div> <small>Expand</small>					
WILLINGNESS TO PARTICIPATE: INTERVIEW						
Are you willing to be interviewed by the evaluator regarding your answers to the following survey? <small>* must provide value</small>	<input checked="" type="radio"/> Yes <input type="radio"/> No					<small>reset</small>
<small>https://hedcap.sydney.edu.au/surveys/?s=CDL99Y4YYL</small>						

22/01/2019 Survey for Relevant UNECE Staff : ForFITS (2014-2018)

Kindly provide your skype ID and/or your phone number.

* must provide value

Kindly access the appropriate link as provided below based on your preferred week (interview is approximately 30 minutes, but slots are allocated up to 60 minutes). Please copy and paste the URL to your browser. Please take note of the instructions in the appointment page introduction.

Nov 5 to 9
<https://tinyurl.com/forfits1>

Nov 19 to 22
<https://tinyurl.com/forfits2>

* must provide value

<https://hedcap.sydney.edu.au/surveys/?s=CDL99Y4YYL> 8/8

6.7. Survey Responses

6.4.1. External Users

ABOUT YOUR CHOICE : FORFITS

How did you know about ForFITS?	Kindly specify the source of information about ForFITS
Other channels	ECLAC's Staff
Through the capacity building activities conducted by UNECE	
UNECE Website	
Referred by a colleague	

Please indicate the importance of the following aspects towards your choice in using ForFITS for your study
**Scale indicates 5 as highly important, 1 as not important*

ForFITS' scope (i.e. modes covered, scale of analysis)	ForFITS' main inputs are available in my country/city	Availability of suitable default values in case local data is not available	ForFITS' capabilities are adequate for generating suitable outputs for the study	User interface of ForFITS	Availability of information on how to access help/support	I have prior knowledge of ForFITS programming language Vensim
3	3	5	3	3	4	5
5	2	2	4	3	3	1
3	2	5	4	2	5	3
3	5	5	4	2	4	3

Please indicate the importance of the following aspects towards your choice in using ForFITS for your study (please choose one for statement).

Statement	Average Rating
I have prior knowledge of ForFITS programming language Vensim	3.0
Availability of information on how to access help/support	4.0
User interface of ForFITS	2.5
ForFITS' capabilities are adequate for generating suitable...	3.8
Availability of suitable default values in case local data is not...	4.3
ForFITS' main inputs are available in my country/city	3.0
ForFITS' scope (i.e. modes covered, scale of analysis)	3.5
ForFITS is free and accessible	4.5

USING FORFITS

Kindly indicate your level of agreement with the following statements. Choose one per line.

The actual resources needed in using ForFITS met my original expectations	ForFITS met my initial requirements in terms of the scope of what can be analysed by the tool	The data inputs needed were in line with my expectations	The modelling capabilities of the ForFITS allowed me to produce outputs as per my expectations	The use of VENSIM as a programming tool for ForFITS is appropriate.	ForFITS is still up-to-date and competitive with other comparable tools	The support from the ForFITS team was adequate and appropriate (please leave blank if not applicable)
Agree	Agree	Agree	Agree	Agree	Disagree	Strongly agree
Agree	Agree	Agree	Agree	Neither disagree nor agree	Agree	Neither disagree nor agree
Neither disagree nor agree	Agree	Disagree	Neither disagree nor agree	Neither disagree nor agree	Agree	
Neither disagree nor agree	Agree	Disagree	Agree	Agree	Neither disagree nor agree	Agree

Kindly indicate your level of agreement with the following statements. Choose one per line.

Statement	Strongly agree	Agree	Neither disagree nor agree	Disagree	Strongly disagree
The support from the ForFITS team was adequate and...	0	1	0	0	0
ForFITS is still up-to-date and competitive with other comparable...	0	1	0	0	0
The use of VENSIM as a programming tool for ForFITS is...	0	1	1	0	0
The modelling capabilities of the ForFITS allowed me to produce...	0	1	1	0	0
The data inputs needed were in line with my expectations	0	1	1	0	0
ForFITS met my initial requirements in terms of the scope of what...	0	1	1	0	0
The actual resources needed in using ForFITS met my original...	0	1	1	0	0

Did you use country or case-specific data for your study? Kindly list down the variables, if any.

For variables related to fleet, demand and supply, I used case-specific data for São Paulo City; for others (economy, technology), country-level data

Case-specific data for Warsaw

study perimeter : Grand Lyon - data from national databases (population, PIB (only know for the region...)) - data from regional databases : PIB, fleet in circulation - data from municipal database : transport Survey, freight

Please identify up to three (3) aspects of using ForFITS that you like the most.

Can be used for comparative studies - Easy to create graphs to show the results
 Freely available, reliable source

Please identify up to three (3) aspects of using ForFITS that you think needs the most improvement.

ForFITS should offer more alternative default values for fuels from all around the world. The estimates I had for Brazilian sugarcane ethanol did not match
 Needs a lot of data that is often not available, not working well on all computers, very few possibilities to learn / train how to use ForFITS i.e. workshops
 Many input data -> many assumptions - inconsistencies when reaching boundary conditions (vehicle renewal rate close to 0%, trains 100% electrical) - negative fuel consumption for petrol powered cars - change of behaviour resulting from change in tran

Kindly elaborate your answer regarding the use of VENSIM for ForFITS.

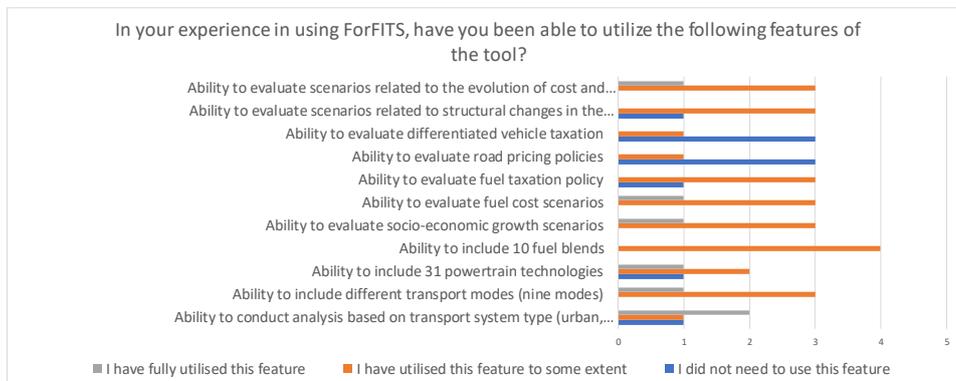
I had already used Vensim before ForFITS, so it was easy to learn how to use ForFITS.
 I don't remember much except that it took me some time to take in hand

USAGE OF FORFITS' FEATURES

In your experience in using ForFITS, have you been able to utilize the following features of the tool?

Ability to conduct analysis based on transport system type (urban, non-urban)	Ability to include different transport modes (nine modes)	Ability to include 31 powertrain technologies	Ability to include 10 fuel blends	Ability to evaluate socio-economic growth scenarios	Ability to evaluate fuel cost scenarios
I did not need to use this feature	I have utilised this feature to some extent	I did not need to use this feature	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent
I have fully utilised this feature	I have fully utilised this feature	I have fully utilised this feature	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent
I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent
I have fully utilised this feature	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have fully utilised this feature	I have fully utilised this feature

Ability to evaluate fuel taxation policy	Ability to evaluate road pricing policies	Ability to evaluate differentiated vehicle taxation	Ability to evaluate scenarios related to structural changes in the transport systems	Ability to evaluate scenarios related to the evolution of cost and performance of vehicle technologies
I have utilised this feature to some extent	I did not need to use this feature	I did not need to use this feature	I did not need to use this feature	I have utilised this feature to some extent
I have utilised this feature to some extent	I did not need to use this feature	I did not need to use this feature	I have utilised this feature to some extent	I have fully utilised this feature
I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent
I did not need to use this feature	I did not need to use this feature	I did not need to use this feature	I have utilised this feature to some extent	I have utilised this feature to some extent



This space is provided for insights that you might have regarding the question above. Please provide explanations, when appropriate.

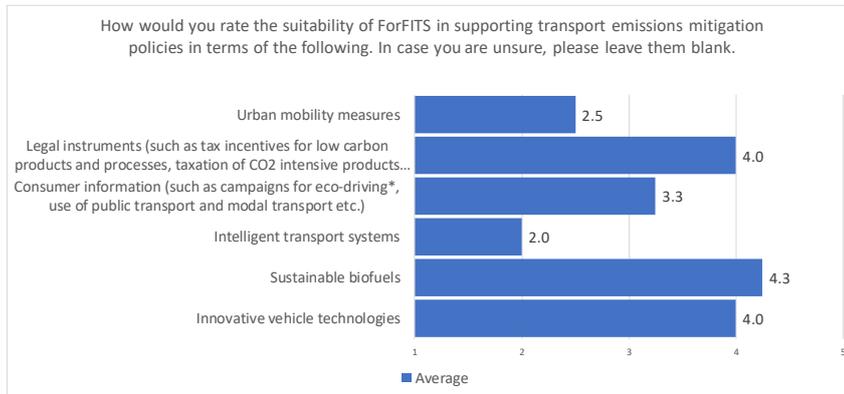
Many policies that can be evaluated by ForFITS can only be implemented nationally. In France, cities are not allowed to tax fuel or vehicles. they have no control on fuel cost. However they can change transport systems, develop public transport services and 'soft'

FORFITS IN SUPPORT OF CLIMATE CHANGE MITIGATION

How would you rate the suitability of ForFITS in supporting transport emissions mitigation policies in terms of the following.

**Scale indicates 5 as highly suitable 1 as not not suitable*

Innovative vehicle technologies	Sustainable biofuels	Intelligent transport systems	Consumer information (such as campaigns for eco-driving*, use of public transport and modal transport etc.)	Legal instruments (such as tax incentives for low carbon products and processes, taxation of CO ₂ intensive products and processes, etc.)	Urban mobility measures
4	5	1	5	4	1
4	4	1	4	4	4
3	3	3	3	3	3
5	5	3	1	5	2



This space is provided for insights that you might have regarding the question above. Please provide explanations, when appropriate.

Regarding intelligent transport systems and urban mobility measures, it would require spatial data analysis, and there are other tools that seem more suitable to this aspect, which are based on GIS, maps, cellular automata. Maybe ForFITS could be integrated to these type of tools to improve the simulations. Regarding urban mobility measures, maybe it would be useful to add a module

IMPACTS OF FORFITS

Have the results of your study been used in policy discussions in the target country/city?

No
Yes
No
Yes

Kindly provide details about such policy discussions, and indicate the name of the policy being discussed and its status.

Both policies were approved: 1. Tax exemption of electric vehicles 2. Tax reduction on hybrid vehicles Policies discussed: Impact of promoting electrified vehicles and public transport simultaneously was proven to provide more benefits than promoting it was used to confirm the Territorial Climate Plan (approved)

FURTHER DEVELOPMENT OF FORFITS

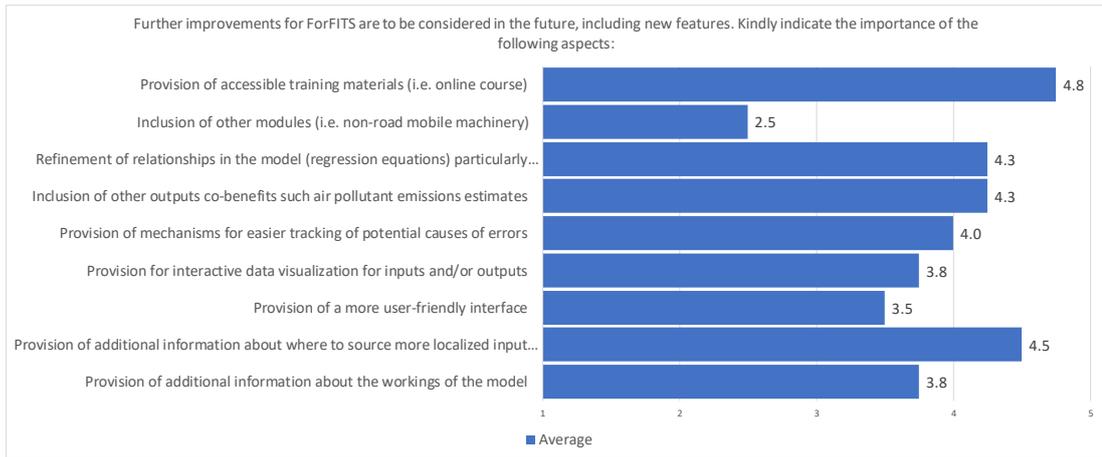
Further improvements for ForFITS are to be considered in the future, including new features.

Kindly indicate the importance of the following aspects:

**Scale indicates 5 as highly important, 1 as not important*

Provision of additional information about the workings of the model	Provision of additional information about where to source more localized input data	Provision of a more user-friendly interface	Provision for interactive data visualization for inputs and/or outputs	Provision of mechanisms for easier tracking of potential causes of errors
5	4	4	4	3
3	5	5	5	5
4	4	2	3	3
3	5	3	3	5

Inclusion of other outputs co-benefits such air pollutant emissions estimates	Refinement of relationships in the model (regression equations) particularly where adequate data is not available	Inclusion of other modules (i.e. non-road mobile machinery)	Provision of accessible training materials (i.e. online course)
5	5	1	4
5	4	1	5
3	3	3	5
4	5	5	5



Kindly indicate other features that you think would be useful to consider in further developing ForFITS

I think it is important to improve the regression equations, especially updating the demand's coefficients. Another possibility would be to incorporate a dynamic model of the demand instead of using regression equations. Another suggestion would be to include a module on urban mobility, based on the characteristics of the urban grid, which influence the job accessibility (provided you find

PERSONAL USE

Will you be using ForFITS in similar studies in the future?	Will you be recommending ForFITS to other colleagues?
No	Yes
Yes	Yes
Yes	Yes
No	Yes

6.4.2 Modellers

KNOWLEDGE ON FORFITS

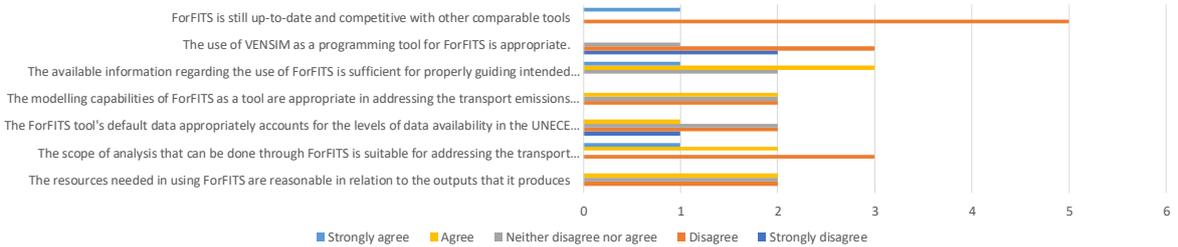
How can you best describe your knowledge about ForFITS	How did you know about ForFITS?	Kindly specify the source of information about ForFITS
I have reviewed it informally	Other channels	Google Search
I have fully utilized it for a study (published)	Through the capacity building activities conducted by UNECE	
I have fully utilized it for an unpublished study	UNECE Website	
I have reviewed it informally	Referred by a colleague	
I have reviewed it as part of a pub	Referred by a colleague	
I have reviewed it informally	Referred by a colleague	

USING FORFITS

Based on your knowledge about ForFITS, kindly indicate your level of agreement with the following statements. Choose one per line.

The resources needed in using ForFITS are reasonable in relation to the outputs that it produces	The scope of analysis that can be done through ForFITS is suitable for addressing the transport emissions modelling-related needs considering inland transportation in the UNECE	The ForFITS tool's default data appropriately accounts for the levels of data availability in the UNECE member states	The modelling capabilities of ForFITS as a tool are appropriate in addressing the transport emissions modeling-related needs within the UNECE	The available information regarding the use of ForFITS is sufficient for properly guiding intended users.	The use of VENSIM as a programming tool for ForFITS is appropriate.	ForFITS is still up-to-date and competitive with other comparable tools
Disagree	Strongly agree	Strongly disagree	Neither disagree nor agree	Strongly agree	Disagree	Strongly agree
Agree	Agree	Disagree	Agree	Neither disagree nor agree	Disagree	Disagree
Neither disagree nor agree	Disagree	Disagree	Disagree	Agree	Disagree	Disagree
Neither disagree nor agree	Disagree	Agree	Disagree	Agree	Neither disagree nor agree	Disagree
Disagree	Agree	Neither disagree nor agree	Neither disagree nor agree	Agree	Strongly disagree	Disagree
Agree	Disagree	Neither disagree nor agree	Agree	Neither disagree nor agree	Strongly disagree	Disagree

Based on your knowledge about ForFITS, kindly indicate your level of agreement with the following statements. Choose one per line.



What do you think are the key strengths of ForFITS?

Very Comprehensive modelling architecture and methodology provides the scope of determining very accurate results
 Useful tool for projecting transport emissions. Accounts for policy changes in a logical manner.
 publically available extensive documentation Vensim visual interface
 Baseline data accuracy and precision, conceptual intuitiveness and pragmatism of modelling assumptions and approach
 From what I remember, apart from the usual ASIF structure, the model is trying to internalize a number of effects, such as urbanization and shape of the city, to better quantify the prospects of shifting travel demand from personal to public transport. This distinguishes the model from other transport projection tools.
 Provides bottom-up approach, let user provide country specific data.

What do you think are the key challenges in using ForFITS?

Very complicated and lack of default regional specific data. The FORFITS modelling problem could be articulated as the 'means' become more important than the 'ends'. I
 User interface is not friendly for new users. Policy needs change over time and the tool can become outdated quickly. Tool is deterministic and does not account for modeling error. Relationships between economic and demographic parameters and transport outcomes are simple and could be investigated further.
 modelling approach is getting outdated Input file very big and could be repulsive Significant time needed to get an hold and use the model
 Lack of capacity to plausibly capture potential impacts of 'disruptive mobility' business models and technologies. Reliance on Vensim software.
 The below impressions are based on what I remember when I reviewed the draft methodology of the model (2012) and later on, when I saw the final product. At the time of the methodology review I agreed with the idea to develop a rather complex tool. Working as a consultant on the ground to develop transport policies in low and middle income countries made me changing my mind-set. Today I'm convinced that models need to be as simple as possible to find significant use outside research organization and academia. Story lines need to be easy to tell and effects need to be investigated in isolation. I did have a last look at the model about three to four years ago. Please take this into account. 1.) To my understanding, the model is too complex, which prevents use by interested users who are not 'modellers'. 2.) Due to the complexity, the Methodology and modelling approach is not transparent enough. Modelling requires technical assistance - not just guidance - and ForFITS does not provide this.

Kindly elaborate your answer regarding the use of VENSIM for ForFITS.

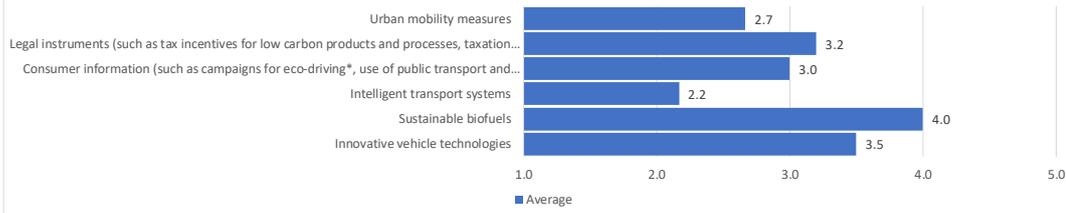
I am not sure if the use of VENSIM makes the modelling 'transparent'. A simple excel tool with macros should have been easier for researchers as they have better control
 This is a not an intuitive interface to use and appears outdated in comparison with interfaces on many other websites. Also running ForFITS takes an excessively long time in my opinion. 10 years ago, I often used Monte Carlo simulation software which seemed to take on much more complicated tasks and complete them in a fraction of the time.
 Vensim has an intuitive visual interface showing interaction between variables. but it can get complicated quickly, and ForFITS have presently 46 views in Vensim that are each quite complex. the size of ForFITS has reached Vensim's limits and a migration to the 64-bit version of Vensim might be appropriate
 Though I haven't used Vensim, my impression (from conversations with modelers who have used it) is that the software is both quite constrained in its approach and rather memory-limited.
 VENSIM is proprietary software which limits the usability of the model when using the free VENSIM running environment. VENSIM can only be used by 'modellers'. VENSIM has a number of modelling restrictions.
 Difficult to set-up and handle on computers that are maintained by company IT departments. Difficult to handle and understand if you are not used to it.

How would you rate the suitability of ForFITS in supporting transport emissions mitigation policies in terms of the following.

*Scale indicates 5 as highly suitable 1 as not not suitable

Innovative vehicle technologies	Sustainable biofuels	Intelligent transport systems	Consumer information (such as campaigns for eco-driving*, use of public transport and modal transport etc.)	Legal instruments (such as tax incentives for low carbon products and processes, taxation of CO ₂ intensive products and processes, etc.)	Urban mobility measures
5	5	3	4	3	3
2	4	1	3	4	4
2	4	2	3	4	1
5	5	1	2	2	2
4	3	3	3	3	3
3	3	3	3	3	3

How would you rate the suitability of ForFITS in supporting transport emissions mitigation policies in terms of the following. In case you are unsure, please leave them blank.



FURTHER DEVELOPMENT OF FORFITS

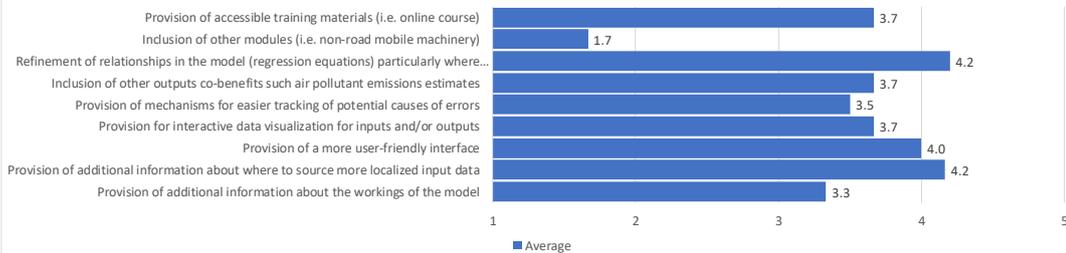
Further improvements for ForFITS are to be considered in the future, including new features. Kindly indicate the importance of the following aspects:

*Scale indicates 5 as highly important, 1 as not important

Provision of additional information about the workings of the model	Provision of additional information about where to source more localized input data	Provision of a more user-friendly interface	Provision for interactive data visualization for inputs and/or outputs	Provision of mechanisms for easier tracking of potential causes of errors
5	5	5	4	5
5	4	4	4	3
2	4	4	5	3
2	2	2	2	2
3	5	5	4	5
3	5	4	3	3

Inclusion of other outputs co-benefits such air pollutant emissions estimates	Refinement of relationships in the model (regression equations) particularly where adequate data is not available	Inclusion of other modules (i.e. non-road mobile machinery)	Provision of accessible training materials (i.e. online course)
5	4	1	4
1	5	1	3
4	4	3	3
5	4	3	3
5	4	1	5
2		1	4

Further improvements for ForFITS are to be considered in the future, including new features. Kindly indicate the importance of the following aspects:



Kindly indicate other features that you need think would be useful to consider in further developing ForFITS

Developing KPI's linking inputs and outputs. Providing country examples for benchmarking and review moving towards 'ForFITS activities' instead of 'ForFITS tool', with more insights into data; e.g. providing national-urban specific emission factors database, where an

The costs and benefits of further developing FORFITS need to be thoroughly evaluated. If it is to be used outside UNECE for cases studies etc. I suggest looking into Country specific emission factors :-)

What do you think are the characteristics of such transport emission models that are becoming more important?

Adaptability of inputs to new and innovative policies will be very important to assess their benefits vs costs. air quality in cities is a major issue nowadays that ForFITS can not address properly. Full life cycle emission is also emerging and a ForFITS update would be needed to be able to provide insights.

Models need to be: - simple (e.g. looking at only one transport mode at the time) - transparent - easy to use - with easily presentable results and story lines - intuitive -

Usually they are maintained and localised by consultants. I think this ownership of technical people and continuous application in the real world is key to successful modelling. Just a model is not appropriate, it requires people to work with it.

6.4.3. UNECE Users/Staff

USING FORFITS

Based on your knowledge about ForFITS, kindly indicate your level of agreement with the following statements. Choose one per line.

The resources needed in using ForFITS are reasonable in relation to the outputs that it produces	The scope of analysis that can be done through ForFITS is suitable for addressing the transport emissions modelling-related needs considering inland transportation in the UNECE	The ForFITS tool's default data appropriately accounts for the levels of data availability in the UNECE member states	The modelling capabilities of ForFITS as a tool are appropriate in addressing the transport emissions modeling-related needs within the UNECE	The available information regarding the use of ForFITS is sufficient for properly guiding intended users.	The use of VENSIM as a programming tool for ForFITS is appropriate.	ForFITS is still up-to-date and competitive with other comparable tools
Agree	Strongly agree	Agree	Strongly agree	Strongly agree	Agree	Strongly agree
Agree	Agree	Agree	Agree	Agree	Neither disagree nor agree	Neither disagree nor agree

Comments

While it is still relevant and up-to-date, ForFITS could benefit from an upgrade to allow it to better model sub national examples, in particular

Kindly elaborate your answer regarding the use of VENSIM for ForFITS.

Please identify up to three (3) aspects of using ForFITS that you like the most.

Provides good results that can be used in policy decisions.

Please identify up to three (3) aspects of using ForFITS that you think needs the most improvement.

See above, sub national outputs is fundamental. Also, the ability to assess other pollutants would also be a benefit as we move away from

FORFITS APPLICATIONS WITHIN THE CONTEXT OF THE UNECE

Kindly indicate your thoughts regarding the utilization of ForFITS within the UNECE.

ForFITS has adequately been used in carrying out policy reviews for the member States	ForFITS has adequately been used in assessing the environmental performance of transport in the Member States and the region in general	ForFITS has adequately been used in developing policy options for sustainable urban mobility
Agree	Strongly Agree	Agree
Neither Agree nor Disagree	Agree	Neither Agree nor Disagree
Neither Agree nor Disagree	Neither Agree nor Disagree	Neither Agree nor Disagree

This space is provided for insights that you might have regarding the question above.

Much more can be done for urban mobility. It can also be used more within member States, but we need to be able to monitor this better. Its interface has been a major obstacle - it is not user friendly. It is also very data-intensive. The combination of the two makes it difficult to deploy it 'in general' and thus reach its full potential. Another issue I faced when promoting the tool is that many governments have their own tools performing similar but not identical functions.

USAGE OF FORFITS' FEATURES

In your experience in using ForFITS, have you been able to utilize the following features of the tool?

Ability to conduct analysis based on transport system type (urban, non-urban)	Ability to include different transport modes (nine modes)	Ability to include 31 powertrain technologies	Ability to include 10 fuel blends	Ability to evaluate socio-economic growth scenarios	Ability to evaluate fuel cost scenarios	Ability to evaluate fuel taxation policy
I have fully utilised this feature	I have fully utilised this feature	I have fully utilised this feature	I have fully utilised this feature	I have fully utilised this feature	I have fully utilised this feature	I have fully utilised this feature
I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent	I have utilised this feature to some extent

Ability to evaluate road pricing policies	Ability to evaluate differentiated vehicle taxation	Ability to evaluate scenarios related to structural changes in the transport systems	Ability to evaluate scenarios related to the evolution of cost and performance of vehicle technologies
I have utilised this feature to some extent	I have utilised this feature to some extent	I have fully utilised this feature	I have utilised this feature to some extent
I did not need to use this feature	I have utilised this feature to some extent	I did not need to use this feature	I did not need to use this feature

This space is provided for insights that you might have regarding the question above.

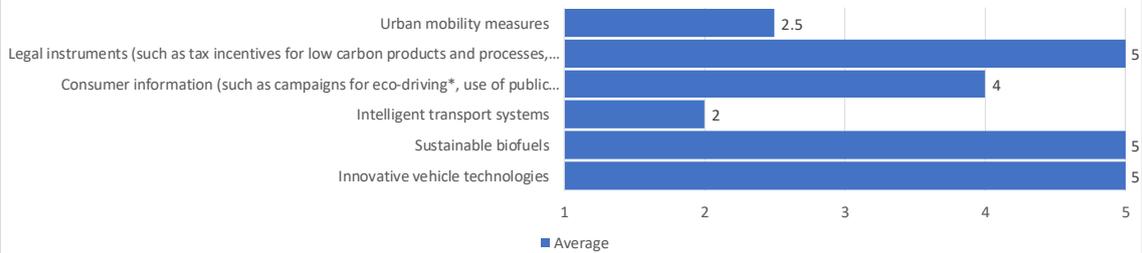
FORFITS IN SUPPORT OF CLIMATE CHANGE MITIGATION

How would you rate the suitability of ForFITS in supporting transport emissions mitigation policies in terms of the following.

*Scale indicates 5 as highly suitable 1 as not not suitable

Innovative vehicle technologies	Sustainable biofuels	Intelligent transport systems	Consumer information (such as campaigns for eco-driving*, use of public transport and modal transport etc.)	Legal instruments (such as tax incentives for low carbon products and processes, taxation of CO ₂ intensive products and processes, etc.)	Urban mobility measures
5	5	2	4	5	1
5	5	2	4	5	4

How would you rate the suitability of ForFITS in supporting transport emissions mitigation policies in terms of the following. In case you are unsure, please leave them blank.



This space is provided for insights that you might have regarding the question above.

IMPACTS OF FORFITS

Are you aware of policy discussions that have resulted partially due to the results of ForFITS applications?

Yes
No
Yes

Kindly provide details about such policy discussions, and indicate the name of the policy being discussed and its status.

EPRs, workshops, etc.
See my earlier point, there is no feedback loop, this should be a fundamental requirement going forward.
In the cases of the countries/cities where its has been applied. Especially through its application in the context of the EPRs, it has supported

UNECE ON FORFITS

Kindly indicate your thoughts regarding the following statements.

The financial allocated to the deployment of the tool (2014-2018) were appropriate	The human resources allocated to the deployment of the tool (2014-2018) were appropriate.	The integration of ForFITS in relevant processes within UNECE is appropriate
Neither disagree nor agree	Neither disagree nor agree	Neither disagree nor agree
Disagree	Agree	Neither disagree nor agree
Neither disagree nor agree	Disagree	Disagree

This space is provided for insights that you might have regarding the question above.

Much more needs to be done here. Staff resources are acceptable but the project needs more funds to be able to do the upgrades set out above and allow it to be better integrated in policies.

What were the key management-related challenges that you encountered in relation to the roll-out of ForFITS?

See above (Much more needs to be done here. Staff resources are acceptable but the project needs more funds to be able to do the upgrades set out above and allow it to be better integrated in policies.)

Do you think that the level of integration of ForFITS in the activities of UNECE is adequate, or do you think that there is a lot of potential for further integration?

See above (Much more needs to be done here. Staff resources are acceptable but the project needs more funds to be able to do the upgrade. There is a lot more potential, especially if it becomes more user-friendly, with an 'expert' and 'beginner' version.

What suggestions do you have in terms of maximizing the usage and impacts of ForFITS within UNECE?

Upgrade it to better reflect city requirements.

Create user friendly interface. Expand its functions to include air pollutants, not just CO₂.

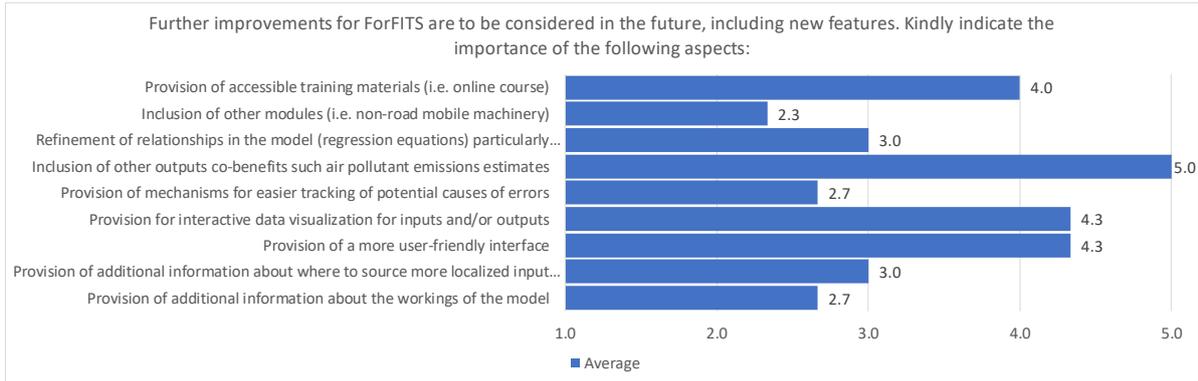
FURTHER DEVELOPMENT OF FORFITS

Further improvements for ForFITS are to be considered in the future, including new features. Kindly indicate the importance of the following aspects:

*Scale indicates 5 as highly important, 1 as not important

Provision of additional information about the workings of the model	Provision of additional information about where to source more localized input data	Provision of a more user-friendly interface	Provision for interactive data visualization for inputs and/or outputs	Provision of mechanisms for easier tracking of potential causes of errors
2	3	5	4	2
3	3	3	4	2
3	3	5	5	4

Inclusion of other outputs such as air pollutant emissions estimates	Refinement of relationships in the model (regression equations) particularly where adequate data is not available	Inclusion of other modules (i.e. non-road mobile machinery)	Provision of accessible training materials (i.e. online course)
5	2	2	3
5	3	2	4
5	4	3	5



6.8. Information about the Reviewed Documents

Author/s	Tamás Andrejszki Budapest University of Technology and Economics tamas.andrejszki@mail.bme.hu Miquel Gangonells Eva Molnar Ádám Török
Date	2014-08-06
Title	ForFITS: A New Help in Transport Decision Making for a Sustainable Future
	International Journal for Traffic and Transport Engineering, 2014, 4(4): 386 - 396
Link	https://pp.bme.hu/tr/article/view/7442
Description/Abstract	The aim of this study is to present a new software tool which was developed to project activity, energy use and CO ₂ emissions in the transport sector. The ForFITS (For Future Inland Transport Systems) program was designed to help policy makers to create long-term transport strategies based on forecasted sustainable emission parameters. This article contains information about the basic methodology of the software and shows how useful the simulations are. With using ForFITS – after collecting the required data – scenarios of future vehicle stocks, costs, energies used, and emissions can be calculated, analysed and compared. The product of the UNDA project is available for any authority freely so it seems like ForFITS cannot have a competitor in the market.
Author/s	Tamas Andrejszki ¹ , Adam Torok ² , Eva Molnar ³ tamas.andrejszki@mail.bme.hu 1, 2 Budapest University of Technology and Economics, Department of Transport Technology and Economics, Hungary 3 Division of Transport, United Nations Economic Commission for Europe, Switzerland
Date	2014-08-06
Title	THE LONG-TERM FORECAST OF LAND PASSENGER TRANSPORT RELATED CO ₂ EMISSION AND ENERGY USE IN HUNGARY
Link	https://www.researchgate.net/profile/Adam_Torok2/publication/286792144_The_long-term_forecast_of_land_passenger_transport_related_CO2_emission_and_energy_use_in_Hungary/links/5810c3da08aef2ef97b2cc40/The-long-term-forecast-of-land-passenger-transport-related-CO2-emission-and-energy-use-in-Hungary.pdf
Description/Abstract	Abstract: Hungary as the part of the European Union must deal with the reduction of CO ₂ level. Reaching the 2050 target requires to examine and develop every sector of the emission. Transport has a dynamic and significant part in CO ₂ emission but generally policymakers do not have the courage to change significantly the modal shift by political decisions because of their popularity. Transport investments are generally long-term investments that show a return in around 30 years. ForFITS is a software tool for policymakers to simulate the effects of different transport scenarios and gives outputs about the transport activity, energy consumption and emission of the next 30 years. Hungary take its' part of the UNDA project as being one of the pilot countries of using ForFITS. After the collection of data different scenarios were made. The aim of this study is to present the most realistic scenario for Hungary especially in the case of passenger transport.
Author/s	Jonathan Gomez Vilchez, Patrick Jochem, Wolf Fichtner jonathan.gomez@partner.kit.edu Institute for Industrial Production and Graduate School of Energy Scenarios Karlsruhe-Stuttgart, Karlsruhe Institute of Technology (KIT)
Date	2015
Title	Energy Use and Emissions Impacts from Car Technologies Market Scenarios: A Multi-Country System Dynamics Model
	33rd International Conference of the System Dynamics Society Cambridge, Massachusetts, USA, 2015
Link	https://www.systemdynamics.org/assets/conferences/2015/proceed/papers/P1252.pdf
Abstract/Relevant quotes	"Strictly speaking, none of these models can qualify as an SD model if feedback processes ⁵ are not explicitly incorporated, which seems to be the case at present time. In our view, ForFITS has the potential to become a truly SD model in a future version, as it has already been implemented in the Vensim® platform."
Author/s	Mitja Šimenc Vienna University of Economics and Business h1250889@wu.ac.at
Date	2015 Aug 18
Title	Overview and comparative analysis of emission calculators for inland shipping
	International Journal of Sustainable Transportation, 10:7, 627-637
Link	https://www.tandfonline.com/doi/pdf/10.1080/15568318.2015.1079753?needAccess=true

Abstract/ Relevant quotes	“The first subgroup is composed of tools based on inventory emission models that deal with aggregated emissions for a vehicle group within the boundaries of a defined system or a certain period. Typical representatives are regionally based [MEERI (LIPASTO, 2011)], lifecycle based [SULCA (VTT, 2013)], and fleet based [mobile combustion GHG emissions calculation tools (GHG protocol, 2013)]. The second group contains high-level calculators and simulation tools used for policy development and macro transportation planning; typical representatives include Sultan (EU Transport GHG: Routes to 2050, 2012) and ForFITS (UNECE, 2013). Finally, the third subgroup is one that corresponds with the scope of this research: trip-specific single-transport operation tools”
Author/s	Jakub Zawieska ¹ , Jana Pieriegud 1 Road and Bridge Research Institute, ul. Instytutowa 1, 03-302 Warsaw, Poland Department of Transport, Warsaw School of Economics, Al. Niepodleglosci 162, 02-513 Warsaw, Poland jzawieska@ibdim.edu.pl 2 Department of Transport, Warsaw School of Economics, Al. Niepodleglosci 162, 02-513 Warsaw, Poland jpriere@sg.h.waw.pl
Date	2018 April
Title	Smart city as a tool for sustainable mobility and transport decarbonisation
Link	https://www.sciencedirect.com/science/article/pii/S0967070X17304092
Abstract/ Relevant quotes	The sustainable governance of transport systems remains a significant challenge for policy makers worldwide, particularly in cities. Urban areas are developing rapidly from a technological viewpoint, and innovative technologies create new possibilities for smart mobility management. Therefore, this study investigates the relationship between the implementation of the smart city concept and the idea of sustainable transport, particularly with regard to the reduction of transport generated CO ₂ emissions. The study estimates CO ₂ emissions for different potential scenarios of development for the Warsaw transport system until 2050 using the United Nations' ForFITS (For Future Inland Transport Systems) model. The study also analyses the additional impact on CO ₂ emissions of smart city elements as determinants of mobility. The results show that meeting the reduction targets set by the European Union 2011 White Paper on Transport will be challenging, requiring an in-depth transformation of the transport and energy sectors. This study also confirms that smart city solutions can play a crucial role in mitigating transport emissions and meeting reduction goals. The conclusions provide important insights for the design of smart mobility governance and enhance the relationship between transport policy and research.
Author/s	Esther Menezes, Alexandre Gori Maia, Cristiane Silva de Carvalhoc 1 Agencia Metropolitana de Campinas, Rua Eng. Candido Gomide, 778, Campinas, SP CEP F6-280, Brazil emenezes@sp.gov.br 2 Universidade Estadual de Campinas-Instituto de Economia, Rua Pitágoras, 353, Campinas, SP CEP 13083-857, Brazil gori@eco.unicamp.br 3 Universidade Estadual Paulista-Faculdade de Engenharia, Departamento de Produção, Avenida Doutor Ariberto Pereira da Cunha, Guaratinguetá, SP CEP 12516-410, Brazil
Date	January 2017
Title	Effectiveness of low-carbon development strategies: Evaluation of policy scenarios for the urban transport sector in a Brazilian megacity
	Technological Forecasting and Social Change Volume 114, January 2017, Pages 226-241
Link	https://www.sciencedirect.com/science/article/pii/S0040162516302219
Abstract/ Relevant quotes	This paper evaluates low-carbon urban development strategies for the transport sector in São Paulo, one of the largest cities in the world. For each mobility policy selected, we build scenarios to evaluate the potential of mitigating GHG emissions, shedding light on institutional aspects, benefits and risks of implementing each measure. Selected policies analysed in this paper focus on: (i) reduction of frequency and distance of motorized trips; (ii) improvement of public transport; and (ii) technological issues, from improvement of fuel efficiency of all transport modes to replacement of fossil fuels by biofuels.
Author/s	Simon Commander, ¹ Zlatko Nikoloski, ² Maria Vagliasindi ³ 1 Altura Partners, IE Business School and IZA 2 London School of Economics 3 World Bank
Date	February 2015
Title	Estimating the Size of External Effects of Energy Subsidies
	IZA DP No. 8865 Discussion Paper
Link	http://ftp.iza.org/dp8865.pdf

Abstract/ Relevant quotes	<p>“This paper explores how large these costs can be by focussing on the size of the external effects that energy subsidies in particular generate in two important sectors – transport and agriculture – in two MENA countries, Egypt (transport) and Yemen (agriculture). Our focus is mainly on the costs associated with congestion and pollution as well the impact of under-priced energy for depletion of scarce water resources including through crop selection.”</p> <p>“By building on earlier research, as well as employing the UN ForFITS model we are able to provide indicative estimates of the external costs of energy subsidies, as manifested in congestion and pollution.”</p>
Author/s	Marc Georges Haddad, Charbel Joseph Mansour, Charbel Afif mhaddad@lau.edu.lb
Date	11 September 2017
Title	Future Trends and Mitigation Options for Energy Consumption and Greenhouse Gas Emissions in a Developing Country of the Middle East Region: A Case Study of Lebanon's Road Transport Sector
Journal	Environmental Modeling & Assessment June 2018, Volume 23, Issue 3 , pp 263–276
Link	https://link.springer.com/article/10.1007/s10666-017-9579-x
Abstract/ Relevant quotes	<p>The study is based on the system dynamics modeling approach and uses the For Future Inland Transport Systems (ForFITS) model, a software tool developed in the context of a project of the United Nations Development Account (UNDA). The study can inform other developing countries in the region about the potential benefits of different mitigation strategies, since these countries share similar infrastructure and resource challenges.</p> <p>This study is novel in several respects: it is the first mitigation publication on a road transport system in Lebanon and the Middle East region; it defines mitigation options that are applicable and feasible in similar developing countries; and, it is the first case study using the ForFITS modeling tool.</p>
Author/s	Rachel da Silva
	Universidade de São Paulo
Date	2015
Title	Methodology for evaluating carbon dioxide emissions in intermodal transport: a case study of Brazilian export soybean.
Link	http://www.teses.usp.br/teses/disponiveis/3/3148/tde-19072016-111514/en.php
Abstract/ Relevant quotes	This dissertation contains information on the comparative characteristics of the different relevant models, including ForFITS
Author/s	Bebkiewicz, K., ¹ Chłopek, Z., ¹ Szczepański, K., ¹ Zimakowska-Laskowska, M. ¹
	Institute of Environmental Protection – National Research Institute in Warsaw Katarzyna.Bebkiewicz@kobize.pl
Date	2017
Title	Assessment of results of pollutant emission inventory of the road transport sector in Poland in 2000–2015
	Archiwum Motoryzacji 2017 Vol. 78, nr 4 5–25
Link	http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.baztech-ea98b9df-f81e-4995-9ced-33dc7d095416
Abstract/ Relevant quotes	<p>The article presents results of inventorying pollutant emission from road transport in Poland in the years 2000–2015, prepared at the National Centre for Emissions Management (KOBiZE) of the Institute of Environmental Protection – National Research Institute. The pollutant emission was determined by modelling, which was carried out with using the EU-recommended COPERT 4 program.</p> <p>ForFITS was also used in the process.</p>
Author/s	UNECE
Date	2015
Title	For Future Inland Transport Systems (ForFITS) Implementation for UNECE Member States Documentation
Filename	Documentation for UNECE Member States application - Dec2015.doc
Link	
Abstract/ Relevant quotes	<p>“2. While significant improvements in the interface of the ForFITS tool as well as in the development of a functional database for ForFITS are also necessary to further enhance the utility of the tool, these tasks were considered outside of the scope of the project.” (p.2)</p> <p>“21. The primary challenge for this project was the lack of resources. One staff member worked on this project on a part-time basis as other tasks occasionally took precedence over this task (including other ForFITS related tasks). As a result, work on this project continued over the course of almost two years to analyse the maximum possible number of countries.</p>

	<p>22. Lack of support in terms of technical review for country projections also increased the likelihood of undetected errors. A full review of all country estimations is needed to provide insurance that analysis is based on sound inputs.</p> <p>23. The status of this project as an extension of the original United Nations Development Account (UNDA) also left some uncertainty on its viability as a long-term activity. Support from member States would be needed to solidify the mandate for continuing the project." (p.7)</p> <p>"27. Another significant shortcoming was the lack of data availability on average fuel consumption for vehicles other than passenger cars.</p> <p>28. While more available than average fuel consumption, data on average annual distance travelled were also generally lacking for vehicles other than passenger cars.</p> <p>29. Collecting data on average vehicle load was another challenge.</p> <p>30. The search for data on the breakdown of vehicles by powertrain also proved difficult.</p> <p>31. Lastly, based on data gaps, the results provided do not include inland water, maritime and air transport." (p.8)</p>
Remarks	<p>The report details the implementation of the ForFITS UNECE-wide implementation project which aimed at providing useful region-wide (national level analysis) insights of vehicle activity, energy use and CO₂ emissions.</p> <p>Forty-one (41) countries were analysed, which represented 78% of the population of all the member states.</p> <ul style="list-style-type: none"> - Available data were used for projecting inputs - Analogies with similar countries were done to estimate data, as well as sourcing non-official data, and the use of statistical inference techniques <p>The main challenges in implementing ForFITS are also highlighted in the report (see previous box). While substantial challenges were encountered, reasonable estimates were produced by the model application, which would be useful in policy discussions.</p>

Author/s	UNECE
Date	2014
Title	Results of the For Future Inland Transport Systems (ForFITS) tool in Georgia
Filename	Draft-BUR Nov 2014 - Informal doc No 5_ForFITS Georgia.doc
Link	
Abstract/ Relevant quotes	
Remarks	The document contains the results of the ForFITS application in Georgia. The results were presented at the third meeting of the Bureau of the Inland Transport Committee in Geneva (Nov 2014). Similar to the other country applications, the study consisted of analyses for five scenarios.

Author/s	Francois Cuenot
Date	2018
Title	ForFITS Users4
Filename	ForFITS Users4.xls
Link	
Abstract/ Relevant quotes	
Remarks	This contains known information about the documented users of ForFITS, as provided by UNECE.

Author/s	UNECE Inland Transport Committee
Date	2018
Title	Draft programme of work of the Transport subprogramme for 2018-2019
Filename	
Link	https://www.unece.org/fileadmin/DAM/trans/doc/2018/itc/ECE-TRANS-2018-21e.pdf
Abstract/ Relevant quotes	<p>"7. The Sustainable Transport Division is responsible for implementing the subprogramme. The subprogramme will contribute to the implementation of the 2030 Agenda for Sustainable Development and the achievement of the transport – related Sustainable Development Goals, especially Goals 3, 8, 9, 11 and 13. Its objective will be achieved through...</p> <p>...(d) The subprogramme will use its in-house developed analytical tools such as the For Future Inland Transport System (ForFITS) and the CO₂ scenario-building tool and related new modules (including a</p>

	<p>module on road safety) in carrying out policy reviews, assessing the environmental and safety performance of the transport and logistics sector, assessing the sector's contribution to national competitiveness and developing policy options for sustainable urban mobility. Particular attention will be paid to the development of capacity for high-quality transport statistics." (p.2)</p> <p>"8. To achieve goals in the above four functional areas, the subprogramme will...</p> <p>...Promote the achievement of the transport-related Sustainable Development Goals and targets for road safety, resilient infrastructure, energy efficiency and sustainable urban mobility in and between cities"</p>
Remarks	

Author/s	UNECE Inland Transport Committee
Date	2016
Title	Draft Programme of Work of the Transport subprogramme for 2016-2017
Filename	
Link	https://www.unece.org/fileadmin/DAM/trans/doc/2016/itc/ECE-TRANS-2016-28e.pdf
Abstract/ Relevant quotes	<p>"7. The responsibility for the subprogramme is vested in the Sustainable Transport Division ("Division"). The Division is responsible for implementing the subprogramme.</p> <p>The subprogramme focuses on four broad functional areas: ...</p> <p>...(d) Capacity-building: special attention will be given to further strengthening the national capacity of countries, assessing the environmental performance of their transport sector with the ForFITS (For Future Inland Transport System) tool, as well as the ways in which the transport and logistics sector contribute to national competitiveness." (p.2)</p> <p>"B. Other substantive activities</p> <p>(ii) Non-recurrent publications</p> <p>Euro Asian Transport Links (EATL) Phase 3 report (1); study on Border Crossing and Customs questions affecting transport (1); "Blue Book", third Revised Edition ECE/TRANS/SC.3/144/Rev.3) (1); White Paper on Inland Navigation (1); Rail Review Intermodal Transport Logistics (1); Climate Change impacts and adaptation for transport networks (1); ForFITS (For Future Inland Transport Systems) (1); Road Safety: Midterm assessment of the implementation of the United Nations Decade of Action on Road Safety (1)." (p. 8)</p>
Remarks	

Author/s	UNECE Inland Transport Committee
Date	
Title	Draft strategic framework for 2020-2021
Filename	
Link	https://www.unece.org/fileadmin/DAM/trans/doc/2018/itc/ECE-TRANS-2018-23e.pdf
Abstract/ Relevant quotes	<p>"(d) The subprogramme will use its in-house developed analytical tools such as the For Future Inland Transport System (ForFITS) CO₂ scenario-building tool, and the Safe Future Inland Transport Systems (SafeFITS) road safety scenario-building tool, in carrying out policy reviews, assessing the environmental and safety performance of the transport and logistics sector, assessing the sector's contribution to national competitiveness and developing policy options for sustainable urban mobility. Particular attention will be paid to the development of capacity for high-quality transport statistics" (pp 3-4)</p>
Remarks	

Author/s	UNECE Sustainable Transport Division
Date	2017
Title	UNECE Sustainable Transport Division Annual Report 2017
Filename	
Link	http://www.unece.org/fileadmin/DAM/trans/doc/2018/itc/Informal_document_No_12_Annual_report.pdf
Abstract/ Relevant quotes	<p>The document mentions ForFITS in the "upcoming activities"</p> <p>"...Development of policy recommendations on the basis of the tool that assesses the impacts of transport policy options on CO₂ emissions (ForFITS)" (p.30)</p>
Remarks	

Author/s	
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Date	2015
Title	2015 Annual Report UNECE Inland Transport Committee ECOSOC Sub-Committee of Experts on Transport of Dangerous Goods and on the Globally Harmonised System of Classification and Labelling of Chemicals UNECE Sustainable Transport Division
Filename	
Link	http://www.unece.org/fileadmin/DAM/trans/doc/2016/itc/2015_UNECE_Sustainable_Transport_Division_Annual_Report_FINAL.pdf
Abstract/ Relevant quotes	For Future Inland Transport Systems (ForFITS) Project <ul style="list-style-type: none"> - Continued growth and relevance of the project in 2015 - Use as a policy tool, as well as for the development of additional ForFITS applications by several countries; - Environment Canada funded a project to study the feasibility of expanding the use of ForFITS to non-road mobile machinery such as agricultural tractors. (p. 24)
Remarks	

Author/s	UNECE Transport Division
Date	2014
Title	2014 – The year of a new level of UNECE transport policy dialogue for sustainable development
Filename	
Link	http://www.unece.org/fileadmin/DAM/trans/doc/2015/itc/77th_ITC-id-19-_Annual_Report.pdf
Abstract/ Relevant quotes	
Remarks	It regards the completion of the UNDA funded ForFITS project as the highlight of the year (p.3 & 6).

Author/s	UNECE Inland Transport Committee
Date	2016
Title	Report of the Inland Transport Committee on its seventy-eighth session
Filename	
Link	http://www.unece.org/fileadmin/DAM/trans/doc/2016/itc/ECE-TRANS-254e.pdf
Abstract/ Relevant quotes	“30. The Committee welcomed information about the application of the For Future Inland Transport Systems (ForFITS) tool ¹ in UNECE countries as well as the regional ForFITS study (ECE/TRANS/2016/7 and Informal Document No. 13). ForFITS is a monitoring and assessment tool for CO ₂ emissions in inland transport, including a transport policy converter to facilitate climate change mitigation. 31. The Committee welcomed progress and expressed its support for the application of the For Future Inland Transport Systems (ForFITS) tool as part of the activities to support governments in mitigating the negative impacts of transport on the climate, as well as the development of the Non-Road Mobile Machinery Module. The Committee considered it important to mainstream the use of the ForFITS tool. To this end the Committee identified the following areas for action: (i) regularly update the UNECE regional review of CO ₂ emissions from inland transport and country reviews on demand; (ii) methodological and capacity-building activities to improve data availability and quality; (iii) improved web-user interface; (iv) development of a corresponding module on local pollutants; and (v) training on the use of the tool. As most of these activities will be subject to extrabudgetary funding, the Committee called for donor support.” (p.8)
Remarks	

Author/s	UNECE Inland Transport Committee
Date	2015
Title	Draft Annual Report of activities undertaken by the Inland Transport Committee's subsidiary bodies in 2014
Filename	
Link	http://www.unece.org/fileadmin/DAM/trans/doc/2015/itc/ECE-TRANS-2015-18e.pdf
Abstract/ Relevant quotes	10. Building upon the successful conclusion of the UNDA phase, the project continued to grow in 2014. Activities focused on future development paths for ForFITS and on its use as a policy tool in certain countries. A project funded by Environment Canada was launched to investigate the possibility of including non-road motorized machinery such as tractors in ForFITS projections. A separate project funded by the International Road Transport Union (IRU) was also approved and will create a separate module to address road

	safety. In addition to projects aiming at expanding the scope of ForFITS, the tool was also used in practice in Kaunas, Lithuania and in Georgia to assess the effects of policy changes on emissions from the transport sector. (p.3)
Remarks	

Author/s	UNECE Inland Transport Committee
Date	2016
Title	Biennial evaluation of Transport subprogramme Programme performance assessment for 2014–2015
Filename	
Link	http://www.unece.org/fileadmin/DAM/trans/doc/2016/itc/ECE-TRANS-2016-27e.pdf
Abstract/ Relevant quotes	6. As part of the cooperation between the ECE Environment and Sustainable Transport Divisions in Environmental Performance Reviews (EPRs), Division staff have been actively involved in the preparation, fact-finding mission and authoring of the transport chapter in the third EPR Reviews of Georgia, Belarus and Tajikistan (ongoing). All reviews integrated analysis generated by the For Future Inland Transport Systems (ForFITS) tool to assess the country's CO ₂ emissions by transport. (p.4)
Remarks	

Author/s	UNECE Inland Transport Committee
Date	2016
Title	Sustainable Transport in the 2030 Agenda and the Sustainable Development Goals
Filename	
Link	http://www.unece.org/fileadmin/DAM/trans/doc/2016/itc/ECE-TRANS-2016-6e.pdf
Abstract/ Relevant quotes	
Remarks	ForFITS was mentioned under Goal 13. Take urgent action to combat climate change and its impacts

Author/s	UNECE Inland Transport Committee
Date	2016
Title	Policy dialogue and technical assistance to countries with economies in transition
Filename	
Link	http://www.unece.org/fileadmin/DAM/trans/doc/2016/itc/ECE-TRANS-2016-5e.pdf
Abstract/ Relevant quotes	<p>“4. It has become evident that there is a gap in the theoretical assessment of measures and trends in support of road safety policy options. Thus, building on the knowledge base in UNECE and largely due to the ForFITS and other technical assistance activities, the secretariat developed the project concept for SafeFITS and attracted extrabudgetary funding for its execution. The International Road Transport Union (IRU) has agreed to finance the development of the SafeFITS tool.</p> <p>5. Using the ForFITS principles, the road safety module ‘Safe Future Inland Transport Systems (SafeFITS)’ aims to facilitate knowledge-based transport policy decision making related to road casualty reduction. The SafeFITS was planned with the primary objective to assist governments and decision makers, both in developed and developing countries, to decide on the most appropriate road safety policies and measures in order to achieve tangible results in improving road safety.” (p.13)</p>
Remarks	

Author/s	UNECE Inland Transport Committee
Date	2016
Title	2016 Draft Annual Report Sustainable Transport Division of the United Nations Economic Commission for Europe
Filename	
Link	
Abstract/ Relevant quotes	“8. Finally, UNECE prepared a work plan for the next two years on possible activities to scale up the use of ForFITS and to further enhance the current version of the model (e.g. new module on local pollutants, new user interface, training sessions). All these activities are subject to fundraising for extra budgetary projects.” (p.3)
Remarks	

Author/s	UNECE Inland Transport Committee
Date	2017
Title	Use and further development of the For Future Inland

	Transport Systems (ForFITS) tool
Filename	
Link	https://www.unece.org/fileadmin/DAM/trans/doc/2017/itc/ECE-TRANS-2017-7e.pdf
Abstract/ Relevant quotes	II. ForFITS 2016-2018 work programme A. Further development of the ForFITS model 1. Development of a new module on local pollutants 2. Development of a new module on Non-Road Mobile Machinery 3. Development of a new user interface B. Use of the existing ForFITS model 1. Training sessions 2. Specific analyses for specific countries
Remarks	

6.9. Information about the NDCs of the UNECE Contracting Parties

Country	Transport	Specific Transport Target	Specific Model - Transport
Albania	Development of the strategic directions for energy and transport sectors will take into consideration the INDC	No	No
Austria	EC Submission		
Azerbaijan	Transport sector Use of environmentally friendly forms of transport, enhancement of the use of electric vehicles at public transportation, electrification of railway lines and the transition to alternative current system in traction, improvement and expansion of the scope of intellectual transport management system, development of metro transport and increase of a number of metro stations, elimination of traffic jams due to the construction of road junctions and underground and surface pedestrian crossings.		LEAP and BALANCE
Belarus			
Belgium	EC Submission		
Bosnia and Herzegovina			
Bulgaria	EC Submission		
Canada	To increase the use of low-carbon fuels, the federal government, working with provincial and territorial governments, industry and other stakeholders, will develop a clean fuel standard to reduce emissions from fuels used in transportation, buildings, and industry. Actions in the transportation sector include continuing to set increasingly stringent standards for light- and heavy-duty vehicles, as well as taking action to improve efficiency and support fuel switching in the rail, aviation, marine, and off-road sectors; developing a zero-emissions vehicle strategy by 2018 and investing in infrastructure to support zero-emissions vehicles; and investing in public transit and other infrastructure to support shifts from higher- to lower-emitting modes of transportation.		Link Link 2
Croatia	EC Submission		
Cyprus	EC Submission		
Czech Republic	EC Submission		
Denmark	EC Submission		
Estonia	EC Submission		
Finland	EC Submission		
France	EC Submission		
Georgia	Three Nationally Appropriate Mitigation Actions (NAMA) are under preparation and, in case of international support, are expected to be implemented prior to 2020. They are expected to be a basis for subsequent larger-scale mitigation actions for the post-2020 period. These NAMA activities include: <ul style="list-style-type: none"> • Gender-sensitive NAMA for sustainable energy in rural areas; • NAMA for Low Carbon Buildings in Georgia; • Vertically Integrated NAMA (V-NAMA) for the Urban Transport Sector. 		
Germany	EC Submission		
Greece	EC Submission		
Hungary	EC Submission		

Country	Transport	Specific Transport Target	Specific Model - Transport
Iceland	Iceland 's electricity production and heating comes almost 100% from renewable energy, with minimal emissions. This was mostly achieved before 1990. This means that Iceland must look to other sectors for mitigation options, including transport, agriculture, fisheries, industrial processes, waste and LULUCF. Iceland considers the utilization of its renewable energy sources to have global benefits from a climate change mitigation perspective.		
Ireland	EC Submission		
Israel	Based on the comprehensive work and findings of the committee, a national emissions reduction target for Israel was formulated and is expected to yield significant benefits to the economy. Submitted jointly to the government by the Ministers of Environmental Protection, Finance and National Infrastructures, Energy and Water Resources the target was approved and includes sector specific targets: <ul style="list-style-type: none"> • Energy efficiency - 17% reduction in electricity consumption relative to BAU scenario in 2030 • Renewable energy – 17% of the electricity generated in 2030 will be from renewable sources • Public transport – 20% shift from private to public transportation. 		
Italy	EC Submission		
Kazakhstan	In order to emphasize its commitment to low carbon growth, Kazakhstan has adopted a Concept on transition to a «Green» Economy. For the implementation of the Concept, an action is developed, under which government programs on waste management, modernisation of housing and communal services, development of sustainable transport, conservation of ecosystems and enhancement of forest cover were adopted. The laws on extended responsibility of entrepreneurs and greening of vehicles are being formulated.		
Latvia	EC Submission		
Liechtenstein	The focus will be on the coordination of climate relevant measures within Liechtenstein's energy policy, transport policy, environmental policy, agricultural and forestry policy.		
Lithuania	EC Submission		
Luxembourg	EC Submission		
Malta	EC Submission		
Moldova	Along with the overall national target, the policy document sets up GHG emissions reduction targets for seven economic sectors: <ul style="list-style-type: none"> • power production sector – 25 per cent GHG emissions reduction compared to BAU scenario has to be achieved by 2020; • buildings, industry and agriculture sectors – 20 per cent GHG emissions reduction compared to BAU scenario has to be reached by 2020; • transport and waste sectors – 15 per cent GHG emissions reduction compared to BAU scenario has to be achieved by 2020; and • LULUCF sector – an increase by 25 per cent of the net removals has to be reached by 2020. 		
Monaco	With regard to road transport, for more than 20 years the Principality of Monaco's transport policy has been based on the following principles: <ul style="list-style-type: none"> • Development of clean public transport • Development of "soft" transport options (pedestrian footpaths, cycling) • Development of electric vehicles <p>The Principality intends to strengthen its emissions reduction policy through balanced measures in each of these three areas. The pedestrian modal share for intra-urban journeys is already above 50%. The policy of developing mechanised walkways, escalators and lifts should reinforce people's instincts to travel on foot. The introduction of a dedicated public transport lane serving the length</p>		

Country	Transport	Specific Transport Target	Specific Model - Transport
	<p>of the Principality is being studied. This should encourage journeys combining public transport and walking.</p> <p>Electric and hybrid vehicles currently account for 2.57% of all cars in the Principality of Monaco. Very rapid growth in sales of hybrid and electric vehicles was recorded at the beginning of 2015. This is due to the availability of more attractive new models and the Prince's Government's incentive policy</p> <p>These efforts should allow the Principality to achieve its emissions targets which are in line with the IPCC emissions scenario5 enabling the temperature rise to be kept below two degrees Celsius, with reductions of between 40% and 70% by 2050, compared with 2010.</p> <p>By adopting a target which goes beyond the reduction requirements stated by the IPCC at the global level and by supporting the development of the latest technologies, the Principality of Monaco wishes to demonstrate its full commitment to this collective process. Even though it represents only a small proportion of global emissions, Monaco has the capacity to become a forerunner in the deployment of innovative, non-emitting modes of transport and energy consumption, and to support innovative waste processing techniques and the development of the circular economy.</p>		
Montenegro			
Netherlands	EC Submission		
Norway	<p>Norway will continue to implement ambitious national climate policies. These policies will be under continuous development. With reference to the White Paper, the priority areas for enhanced national climate policy efforts are:</p> <ul style="list-style-type: none"> • Reduced emissions in the transport sector • Low emissions technology in industry • CO₂ capture and storage • Renewable energy • Environmentally friendly shipping 		
Poland	EC Submission		
Portugal	EC Submission		
Romania	EC Submission		
Republic of San Marino			
Republic of Serbia			
Slovakia	EC Submission		
Slovenia	EC Submission		
Spain	EC Submission		
Sweden	EC Submission		
Switzerland	In Switzerland, abatement costs are high due to the limited availability of short term cost-efficient mitigation potential: Switzerland's energy production is nearly carbon free and there is little heavy industry. Emission reduction potential mostly remains in the housing and transport sectors. This remaining potential has long transformation periods.		

Country	Transport	Specific Transport Target	Specific Model - Transport
Tajikistan	The potential for reducing greenhouse gas emissions in the Republic of Tajikistan to achieve a target of 65- 75% of the 1990 level by 2030 , which amounts to 1.2-1.7 tons in CO₂ equivalent per capita. It will be possible in case of implementation of investment projects and national programmes in the sphere of power industry, transport, agriculture and forestry and water resources management, risk reduction of natural disasters, promotion and diversification of renewable energy sources and reduction of energy losses; modernization, introduction of new technologies and development of the sectors of the economy.		
Republic of Macedonia	To reduce the CO ₂ emissions from fossil fuels combustion for 30%, that is, for 36% at a higher level of ambition, by 2030 compared to the business as usual (BAU) scenario. The CO ₂ emissions from fossil fuels combustion cover almost 80% of the total GHG emissions in the country with a dominant share of the following sectors: energy supply, buildings and transport. Transport 15. Increased use of railway 16. Renewal of the vehicle fleet 17. Increased use of bicycles, walking and introduction of a parking policy Transport 8. Extension of the railway to Bulgaria 9. Electrification of transport		MARKAL
Turkmenistan			
United Kingdom	EC Submission		
Ukraine			
United States	The U.S. target covers all IPCC sectors. Under the Clean Air Act, the United States Department of Transportation and the United States Environmental Protection Agency are moving to promulgate post-2018 fuel economy standards for heavy-duty vehicles.		Link
Uzbekistan	Extension of transport and logistics communication systems, ensuring efficient energy resources use (including optimization of transportation routes, improvement of motor roads quality, etc.).		