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A transport policy tool for reduction of CO_2 emissions in Finland – Visions, scenarios and pathways using pluralistic backcasting method

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Abstract

The reduction of greenhouse gas emission was the basis of a Delphi study where expert opinions about future development were asked and used to form visions of the future, and further elaborated to scenarios using a pluralistic backcasting method. A new innovative approach on how to use and combine methods and data from various disciplines in scenario modelling, on transport policy packaging and determining pathways to reach the desired futures, is presented for two of the visions analysed in detail. This paper focuses on the diverse methods and data used while the scientific background of the backcasting method has already been published in Tuominen et al. (2014).

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Keywords: transport; emission reduction; impact assessment; scenarios; policy packages; backasting

1. Introduction

Global warming, urbanisation, security issues, aging population as well as digitalisation of our technical and service environments are grand challenges for the transport sector. In addition, long-term investments and the strong role of regulation are typical features of the transport system, posing challenges for strategic long-term planning. They call for systemic innovations or transitions in transport systems, i.e. a shift from the current socio-technical

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system to a more sustainable one for a long period of time. Strategic planning and transitions can be supported by interdisciplinary, systemic and integrated research approaches presenting alternative visions of the future and pathways to reach them. Tuominen et al. (2014)

In a national Finnish research project ILARI funded by the Ministry of Transport and Communications the aim was to structure multiple visions of the future on CO_2 emissions of transport in Finland up to the year 2050 for the use of the policy-makers in their decision-making process. For this purpose a pluralistic backcasting method was developed and a set of visions of the future that were transformed to scenarios for different sectors of transport was formed. The process was finally complemented with pathways from present to the future. Calculations of the actual impacts on GHG emissions were based on trends and forecasts for both transport behaviour and technical development including a wide set of policy packages to achieve the futures set by the visions.

For the entire process from vision formulation to transport behavioural changes and policy packages to steer the transformation from present to the desired future several methods, travel surveys, statistics, trends and other databases as well as literature for parameters were used and combined. The overall structure of the method is presented in Figure 1 and in more detail with data sources in Appendix A. This paper concentrates on the methods and data sources used and how they were combined in the different phases of the study.

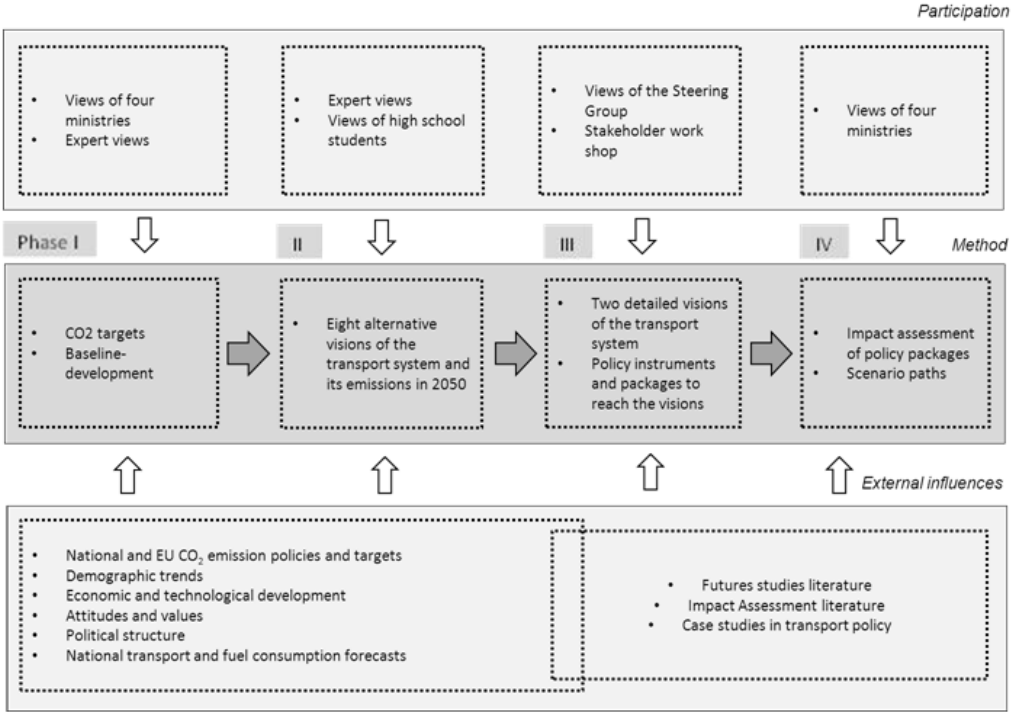

Figure 1 The method for pluralistic backcasting of national climate policy for transport

2. Setting the future

2.1. Theory of backcasting

Scenario building provides a family of methods that can be used in futures studies for developing strategies and pathways. Many of the scenarios are constructed from the past and present towards the future and are hence forward looking. Backcasting scenarios instead look backwards from the desired future (Robinson, 1990; Hirschorn,1980). The major concern is not which futures are most likely to occur, but how to attain desirable futures. The two types of