Ilmastopaneeli

NEED, HABITS, TECHNOLOGY AND ECONOMY – CLIMATE CHANGE MITIGATION MEASURES IN TRANSPORT (9/2015)

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Background

The carbon dioxide (CO_2) emissions from Finnish transport sector were 12,0 Mt in 2013, which is about 23% of total CO_2 emissions in Finland. The transport sector's share of emissions has grown during the last few years as the emissions from industry and energy production have decreased. Hence, the development of transport emissions is increasingly important when the possibilities to achieve the greenhouse gas reduction targets in Finland are evaluated. The CO_2 emissions of transport should be decreased from the 1990 level by at least 40% by 2030 and 80% by 2050. The objective of the Climate Panel project was to identify the measures that can be taken to reach the emission reduction targets of transport in a cost-efficient way.

The cost efficiency of packages of measures

The most cost efficient measure for the society is to support a shift from private car use to social car use through increasing car-sharing and ride-sharing. Measures affecting the development of urban form are also very cost efficient as costs are mostly caused by dissemination of best practices. Affecting the modal split by developing walking and cycling infrastructure may also be very cost efficient at the end, because of the related health benefits. Rail infrastructure projects dominate the development of public transport; and while being expensive, they also improve transport safety. Technological measures induce costs to the society because reducing the energy consumption of cars and the uptake of alternative fuels and vehicles both require high investments. However, significant emission reductions may be achieved through technological measures and the emission reduction targets can be achieved through technological measures only. This would require a rapid uptake of alternative energy vehicles and several important societal benefits would be missed, such as health benefits, energy savings and fixed car cost savings. In addition, the technological measures cause the external emissions from transport sector to energy production sector to almost double because of the alternative energy vehicles. Purely economic measures have rather limited emission reduction potentials as such, but they can be seen as supportive measures which should be combined with other measures.

Further research

The aim of this study was to explore the cost effectiveness of achieving the 80% emission decrease target by 2050. However, the target may be even greater in the transport sector because emission reductions may be more difficult to achieve in other non-emissions trading sectors, for example in the agriculture sector. Hence, there is a need to explore the measures, costs and benefits of even greater emission reduction in transport sector. The resources of this study did not enable analysing the effects of individual measures, but the methodology developed in this study enables such analyses in the future. More detailed analysis should also include sensitivity analysis related to e.g. energy costs and the timing of measures.