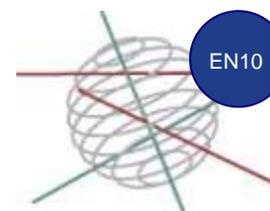


TRANS2HOUSE



Transition pathways to efficient (electrified) transport for households

DURATION OF THE PROJECT
15/12/2009-31/01/2012

BUDGET
356.128

CONTEXT

The European 20-20-20 objective aims at reducing greenhouse gases by 20 %, increasing the share of energy from renewable sources by 20%, as well as achieving an overall increase of 20 % in energy efficiency by the year 2020. Meeting this objective will not be straightforward, several studies predict even an increase in energy consumption for the coming years. A shift to a more rational energy use is essential in attaining these objectives. This transition must be supported by the demand side of the economy, the project will place the spotlight on households and how to achieve a decline in their energy consumption.

Consumers are generally in favour of ecologically friendly transformations regarding energy usage and production, but their environmental consciousness is not translated in adapted consumption patterns and behaviour. Therefore it is necessary to better understand the factors that influence household energy consumption and to formulate driving forces to shift existing barriers (social, cultural, technological, economic, legislative and political). The scope of the investigation is the personal mobility part of the household energy consumption.

To introduce 20% of renewable energy in 2020, storage is considered as an essential element to absorb the green energy when it is produced without overloading the network. If the charging periods of the electrified cars can be controlled, they can be transformed into flexible consumers in the distribution grid. This would help both politicians as well as the energy distribution companies. In the European Competitiveness Report, the energy market liberalisation is one of the most important drivers of competitiveness while their innovation focus moves towards cost-reducing technologies and consumer services. Electric vehicles (EVs) and plug-in hybrid vehicles (PHEVs) are seen as a core part of this innovation.

Recently, EV and PHEV are receiving a tremendous interest from consumers, car manufactures, politicians and energy companies, who are now finding themselves ready to be a part of the introduction of these types of cars.

So it seems that a transition of the whole mobility concept is about to happen in favour of an electrified propulsion system. But are we ready for this change? Which actions can be taken to facilitate this transition and which ones to make this change even more beneficial? How can policy steer households in an energy efficient way?

PROJECT DESCRIPTION

Objectives

The main objective is to investigate how to develop driving forces and shift the social, cultural, technological, economic and political barriers to household energy consumption reduction. The focus is on personal transport, as a part of the household. Public transportation, electric scooters and bicycles will not be assessed in this project, but can be an interesting subject to extend this project in a later stadium.

This study aims also to assess the transition towards EV and PHEV for Belgium and its regions, while having a critical eye on their impact on the sustainability goals as defined in the EU 20-20-20 objective. It considers also the budgetary impact on households, the impact on employment and related economic issues like the competitiveness of Belgium.

Due to the higher energy efficiency, a reduction in fuel consumption is expected when introducing electrified transport. This will result in a decrease in fuel expense for households. Whether the fuel saving leads to less CO2 emission strongly depends on the way the extra electricity need will be produced. The electrified vehicles can extend the green energy production by being flexible consumers if their charge moments are controlled. Other emissions as NOX and small particles are in all cases diminishing and in addition no pollutants are emitted where the vehicles are driving. These considerations have to be fully explored in this project and transformed to the Belgian situation.

Work programme

The project is split into three subsequent analysis stages, each divided into specific research topics.

In the first phase of the project a state of the art analysis will be performed. The second phase is the core of the project and consists out of the assessment of the different impacts that the roll-out of EVs and PHEVs will have. This part has a horizontal as well as a vertical fragmentation. The impacts on the electricity grid and on households will be examined from a technological, environmental, economic and social viewpoint.



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This multidisciplinary analysis will consider:

- Impact on electricity grid:
 - o impact of EV and PHEV on the electricity network and the basic requirements to support the introduction of (PH)EVs;
 - o possibilities of smart grids to improve energy efficiency and usage of green energy production while exploiting the storage capacities of EVs.
- Impact on households
 - o energy use of (PH)EVs;
 - o impact on environmental and sustainability indicators;
 - o life cycle cost (LCC);
 - o purchase behaviour and electric cars;
 - o travel behaviour and electric cars;
 - o social barriers, incentives, driving forces and stimulations.

The third part of the project consists of translating the analysis of the previous part into stimulants for households and building transition pathways:

- Transition pathways and multi stakeholder validation
 - o preliminary transition pathways
 - o multi stakeholder validation
 - o final transition pathways

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Structure of the project

