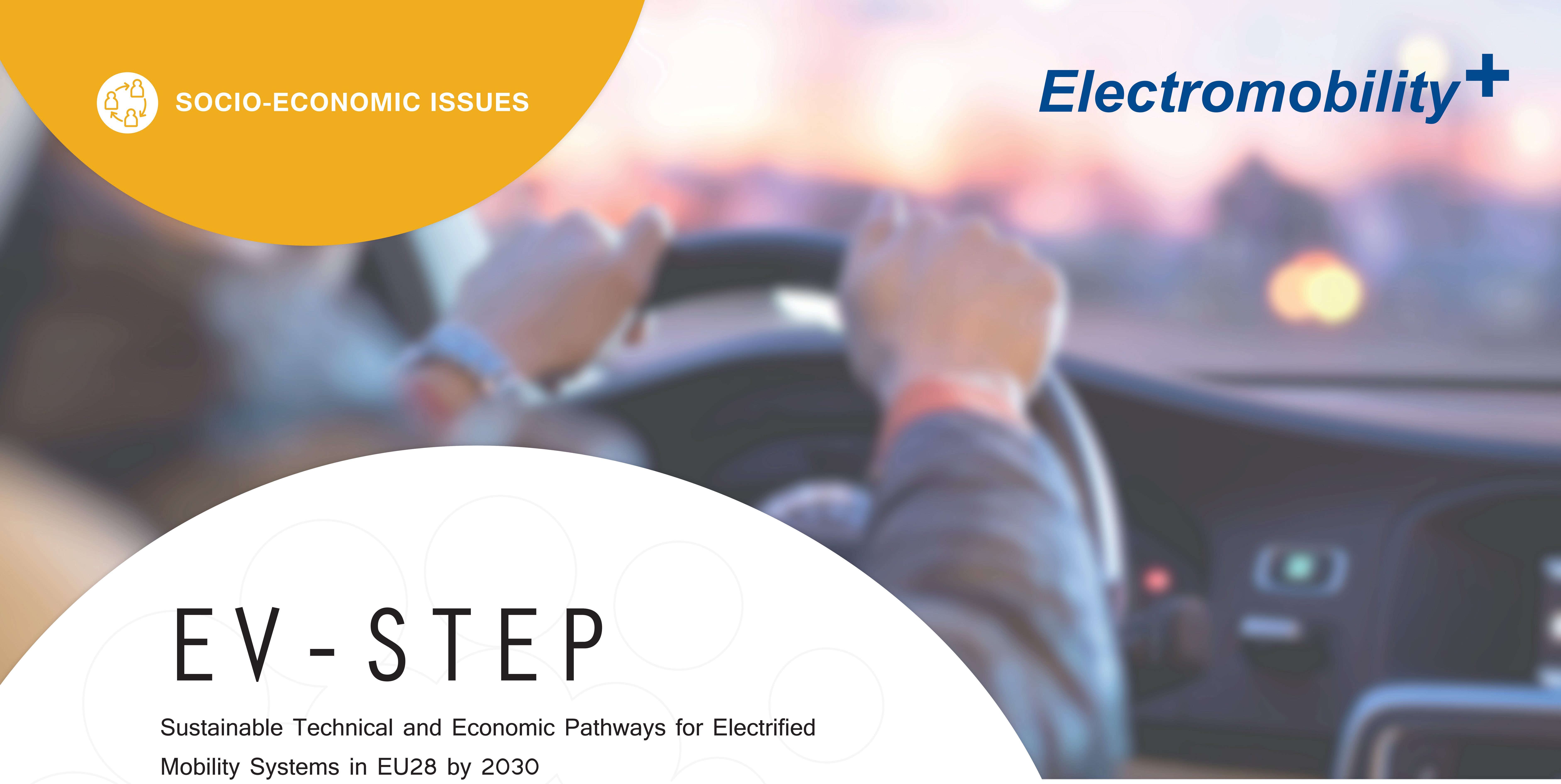

SOCIO-ECONOMIC ISSUES

Electromobility+

EV-STEP

Sustainable Technical and Economic Pathways for Electrified Mobility Systems in EU28 by 2030

EV-STEP

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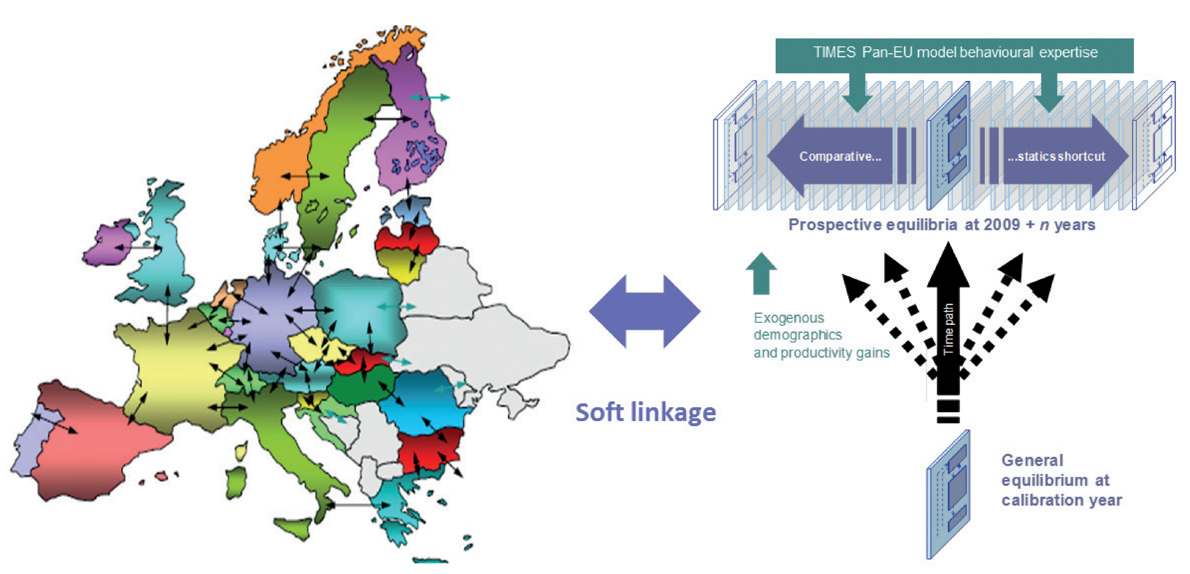
>> Technical and economic study of electric mobility development <<



TIMES Pan-EU model

IMACLIM-P

Project Data

Funding/€	Total cost/€	Duration
502.660	734.634	24 months

Partners

Association pour la Recherche et Developpement des Methodes et Processus Industrielles, Centre de Mathématiques Appliquées, FR
Institute of Energy Economics and the Rational Use of Energy (IER) University Stuttgart, DE | DTU Management Engineering, DK
Société de Mathématiques Appliquées et de Sciences Humaines, FR

Main Results

- Linkage of a technology bottom-up energy system optimisation model (Pan European TIMES) with a dynamic recursive Computable General Equilibrium model (IMACLIM-S).
- Development of a dedicated model for case studies in France and Denmark.
- Deployment of scenarios for electric vehicles until 2030.

Project conclusion

The EV-STEP project focused on the technical and economic conditions of electrified mobility at a strategic EU level with EU wide models, and also at a more local scale with dedicated case studies.
On the strategic EU level, the TIMES PanEU energy system model shows that an economic expansion of hybrid electric vehicles happens at the earliest in 2030 and in subsequent years to 2050. Against this background, the ambitious national targets appear as very high. Only under a scenario with an extreme climate protection target and estimated big efforts in the direction 'economies of scale' in battery technology, these electric cars reach on EU level a market share of 70% for cars.
The IMACLIM-P model was then used to estimate the macro-economic consequences of EV penetration for each energy system scenario produced by TIMES PanEU. The first conclusions show that the penetration of electric cars has contrasted impacts depending on the mitigation context. Under moderate GHG constraint, a strong development of the electric car up comes at a quite low GDP and unemployment cost. Contrastingly, under stringent mitigation objective there could be important GDP losses due to a strong increase in the marginal cost of electricity.
In the Paris Ile de France region case study, the EV-CAP model was developed to compute mobility patterns and individual charging profiles for a fleet of EVs. The results show that the current benchmark curves very partially represent the range of possible effects. Maximum loads could range from 0.7kW/vehicle to 10kW/vehicle. In V2G modes a reduction of load up to -3kW/vehicle in peak periods coincides with an increase of 2kW/vehicle in other time periods.
A second case study focused on electric vehicle as a mean to balance wind power in the western Denmark region. Under completion, it will provide a specific focus on grid balancing capacity as argument for electrified mobility.

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