

e-mobiliTI Potentials and implications of the transition to electric mobility. Insights from a living lab in Southern Switzerland

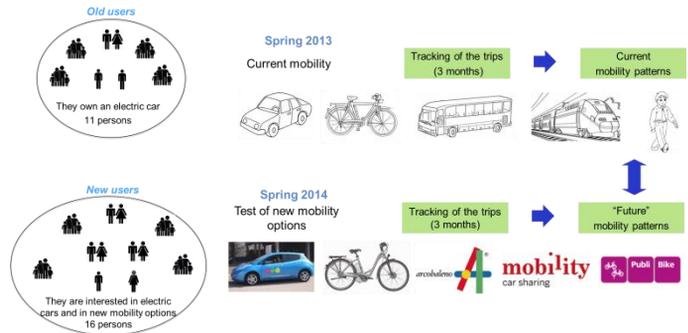
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1. Background

- The transition towards electric mobility offers undeniable advantages for the reduction of air pollution and noise in urban areas, for climate protection at the worldwide level (provided that renewable electricity is used) and for direct integration with smart electric grids
- Electric vehicles (EV) might also turn into an effective leverage to promote a wider transition towards more sustainable mobility life-styles
- Their limitations in EVs' range of autonomy might in fact push drivers to:
 - take awareness of the daily kilometers travelled
 - plan their trips in advance
 - drive only the really necessary kilometers
 - and refer to other energy-efficient means of transportation when the range of autonomy is not wide enough for their needs

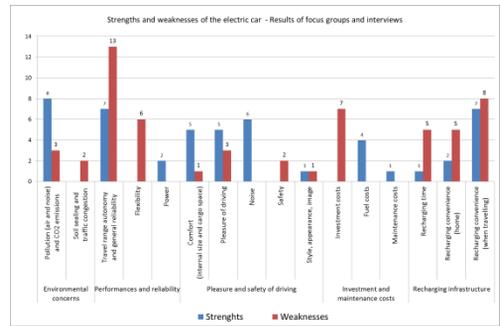
2. What happens when a family is given for three months an electric vehicle? The e-mobiliTI living lab

- Real-life users explore new mobility options in complex, real-world settings
- 16 families of the Lugano Region (TI), in 2 categories: *old* and *new* users
- Two monitoring phases (three months each): Spring 2013 and Spring 2014
- Spring 2013: we observe the participants' current mobility patterns
- Spring 2014: we observe the participants' mobility patterns while freely experiencing new mobility options: one EV and e-bicycle for family, together with public transport season tickets, car-sharing and bike-sharing subscriptions for every member of the family
- Mobility monitoring is performed by a dedicated smartphone app, built on purpose, and it is supported by interviews and focus groups
- Our sample is small and not representative of the Lugano population
- However its members have a variety of socio-economic backgrounds, lifestyles and attitudes towards ecology



3. Does the substitution between conventional (ICEV) and electric vehicles (EV) take place?

- The potential for substitution between ICEVs and EVs is high: EVs' performances are highly appreciated and they are regarded as a valuable alternative to ICEVs
- Both the number of trips and the average daily percentage of kilometers driven are in fact double by EVs than by ICEVs
- However, should they replace their ICE vehicle today, the majority of the *new users* would not buy an EV as one and only family car, preferring instead either to buy a hybrid HEV or to buy it as second (or third!) family car
- The main perceived limitation is the autonomy range related to the investment cost: participants dislike the idea they will not be able to use a car they paid a lot of money for, even though they are aware this will only happen for occasional trips



4. Can electric mobility act as a leverage to favour a wider transformation towards sustainable mobility patterns?

- A transformation towards more sustainable mobility patterns does not occur
- On the contrary, in some cases a rebound effect is registered: the use of private motorized means of transport (PMT, accounting for both ICEV and EV) increases, due to a general perception of being green, consuming less energy and spending less money for the fuel
- This is also partly due to a novelty effect and to the awareness that the EV would remain available only for a limited period of time
- When the use of EVs is precluded due to autonomy reasons, public transportation in combination with electric bicycles and car or bike-sharing is not regarded as a valuable alternative to ICEVs
- When a PMT means of transport is available, either ICEV or EV, it markedly prevails over other mobility options – even if they are free!
- A decrease in PMT would require further improvements in the quality of the mobility options other than the car, especially in terms of flexibility, capillarity, comfort and safety



5. Future scenarios and policy recommendations

- The elements gathered allow us to draw possible scenarios for the future
- They are developed in a narrative fashion, adopting a bottom-up perspective and a back-casting approach: each scenario describes how an average family moves and indicates the measures allowing to make it happen
- According to the different dotations of mobility options available, we call them either "substitution" or "transformation" scenarios
- Scenarios A and B are definitely the easiest to implement, because they require less changes in individual behaviour
- However, only scenario D would produce the paradigm shift we are now in need of - and that's what forward thinking political choices should promote

