Is the strategy for sustainable transition of automobility through electric shared automated vehicles realistic? An analysis of key actors’ purposes and motivations

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Presentation outline

1. Introduction
   Three revolutions of automobility (electric-shared-automated): scientific, market and policy perspectives

2. Theoretical background and methods

3. Key actor I: Automotive industry and mobility operators

4. Key actor II: Users

5. Key actor III: Public authorities

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1. Introduction

Three revolutions of automobility (electric-shared-automated): scientific evidence

1. Introduction

Three revolutions of automobility (electric-shared-automated): market and policy
1. Introduction

To what extent is the strategy for sustainable transition of automobility through electric shared automated vehicles realistic?
2. Theoretical background and methods

1. Theoretical background:
Social construction of technology (SCOT) and multi-level perspective (MLP)

2. Identification of key actors:
Automotive industry and mobility operators, users and societal groups, public authorities

3. Analysis of key actors’ preferences and motivations towards shared automated electric vehicles:
Backward snowballing of grey and peer-reviewed literature per key actor

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3. Key actor I: Automotive industry and mobility operators

Preferences towards owned vs shared vehicles business model

• **With an increase in shared mobility in Europe, vehicle manufacturers face ...**
  
  … a decline in vehicle sales (private segment),

  … an increase in vehicles sales (shared vehicles segment; partly compensating the decline in private segment sales),

  … large fleet customers (strong negotiation power, main focus on cost-related factors),

  … fierce competition (traditional competitors developing mobility services; new market entrants – tech related companies in the mobility sector, e.g. Waymo),

  … and brand building challenges (“aviationfication” of car market).

3. Key actor I: Automotive industry and mobility operators

Preferences towards ICE shared vs electric shared vehicles business model

• **Today, (independent) fleet operators large rely on the ICE shared business model due to ...**
  ... higher leasing costs of electric vehicles,
  ... an insufficient public charging infrastructure,
  ... range anxiety of electric vehicle users,
  ... the lower number of electric vehicle repair shops.

• **In the future, however, electric fleets will be more profitable for operators due to ...**
  ... vanishing additional leasing costs,
  ... smaller maintenance costs,
  ... and lower energy consumptions, especially for short distance services of shared vehicles.

4. Key actor II: Users
Preferences towards shared vs owned AVs

- Preference for shared AVs is lower than owned AVs due to...
  - instrumental factors: limited vehicle availability, higher waiting or access time, increased journey time, lower time and cost reliability, higher total cost of ownership and use,
  - psychological factors: aversion of sharing, privacy and security concerns, self-efficacy concerns, inherent attractiveness of ownership,
  - ideological and symbolic factors: socio-economic status, subjective identity, sense of power, freedom, superiority, proprietorship, individuality, independence, masculinity, professional accomplishment.

5. Key actor III: Public authorities
Possible public revenue losses from the transition from owned to shared AVs

- For public authorities shared AVs translate into lower public revenues because of less...
  - sales and property taxes,
  - license plate and registration fees,
  - parking tickets,
  - traffic fines.

- Overall transport-related revenues could by reduced by more than 20% (US context).
- Case study Buenos Aires: 70%/30% owned/shared AVs (-17.9% transport revenues)
  30%/70% owned/shared AVs (-57.4% transport revenues)

5. Key actor III: Public authorities

*Possible public revenue losses from the transition from ICE to electric vehicles*

- **For public authorities electric vehicles translate into lower public revenues because...**
  - ... revenues today primarily come from energy taxes on gasoline and diesel,
  - ... the electricity tax paid by an electric vehicle user per kilometer is less than 10 percent of the energy tax paid by an ICE vehicle user.

6. Conclusions

- **Electric shared automated vehicles**: silver bullet for **sustainable transition** of **automobility** (automotive industry, consultancies, media supported by research evidence).

- **Our outcomes**: **key actors** (automotive industry, users, public authorities) have **opposing** interests, preferences, motivations or financing schemes to the **electric shared automated vehicles transition**. Appears as a no realistic transition at the moment.

- **Primary resistance**: vehicle ownership to sharing transition, **secondary resistance**: ICE to electric vehicles transition.

- **Reasons**: (a) automotive industry - **smaller profit margins**, (b) users - **instrumental, psychological, symbolic reasons**, (c) public authorities - **less public revenues**.

- **Future research**: explore ‘contradictions’ of expressed visions by key actors on the future of **automobility** (e.g. greenwashing, market overcapitalization, discourses of sustainable mobility delay).
References