Electric Charging Infrastructure and Gender Equality

Main results from a literature-based overview for USER-CHI

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AGENDA

- ✔ 1. INTRODUCTION

  Overview, motivation and relation to Station of the Future Handbook

- ✔ **2. RESULTS**

  Conducted from the literature review

- ✔ 3. APPROACHES & RECOMMENDATIONS

  In conjunction with the USER-CHI project

Introduction

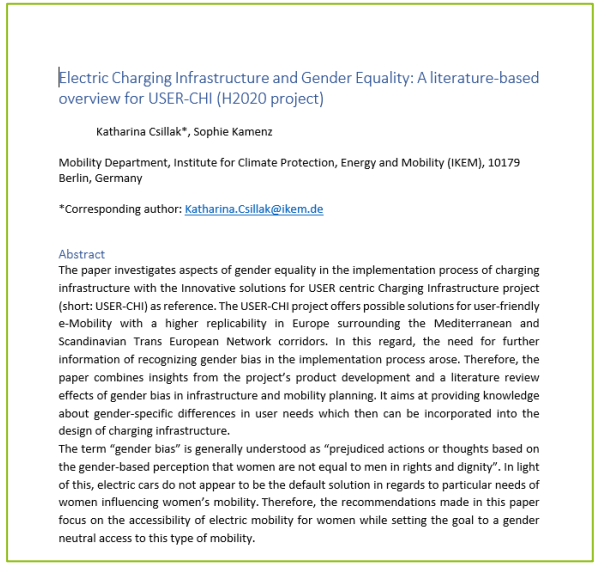
Main results from publication

Csillak, K. and Kamenz, S. (*202x*): Electric Charging Infrastructure and Gender Equality: A literature-based overview for USER-CHI (H2020 project). Open Research Europe. [*Work Title*]

Motivation

- The need for further information to recognize gender bias throughout the implementation process of the project.
- Knowledge gap between gender topics related to charging infrastructure
- Gap in research

How can the future charging points be designed and implemented in a gender-equal way?



Electric Charging Infrastructure and Gender Equality: A literature-based overview for USER-CHI (H2020 project)

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Abstract

The paper investigates aspects of gender equality in the implementation process of charging infrastructure with the Innovative solutions for USER centric Charging Infrastructure project (short: USER-CHI) as reference. The USER-CHI project offers possible solutions for user-friendly e-Mobility with a higher replicability in Europe surrounding the Mediterranean and Scandinavian Trans European Network corridors. In this regard, the need for further information of recognizing gender bias in the implementation process arose. Therefore, the paper combines insights from the project's product development and a literature review effects of gender bias in infrastructure and mobility planning. It aims at providing knowledge about gender-specific differences in user needs which then can be incorporated into the design of charging infrastructure.

The term "gender bias" is generally understood as "prejudiced actions or thoughts based on the gender-based perception that women are not equal to men in rights and dignity". In light of this, electric cars do not appear to be the default solution in regards to particular needs of women influencing women's mobility. Therefore, the recommendations made in this paper focus on the accessibility of electric mobility for women while setting the goal to a gender neutral access to this type of mobility.

Peer-Review Process

Publishing

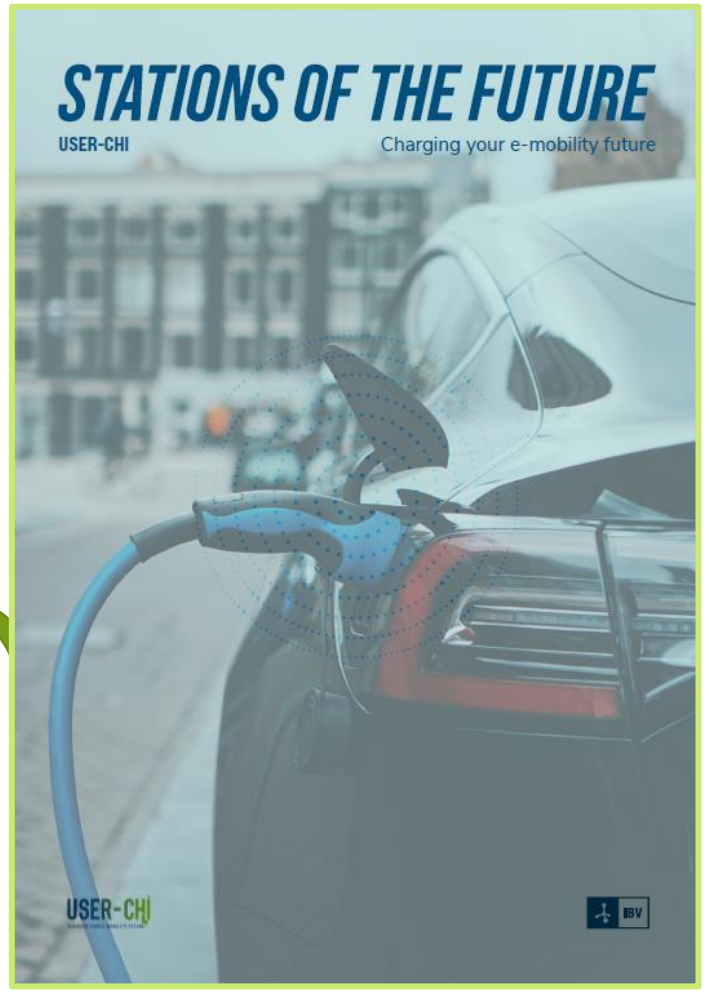
Approx. End of 2022

Relation to Station of the Future Handbook

The handbook includes guidelines and recommendations to design the perfect user-centric charging station.

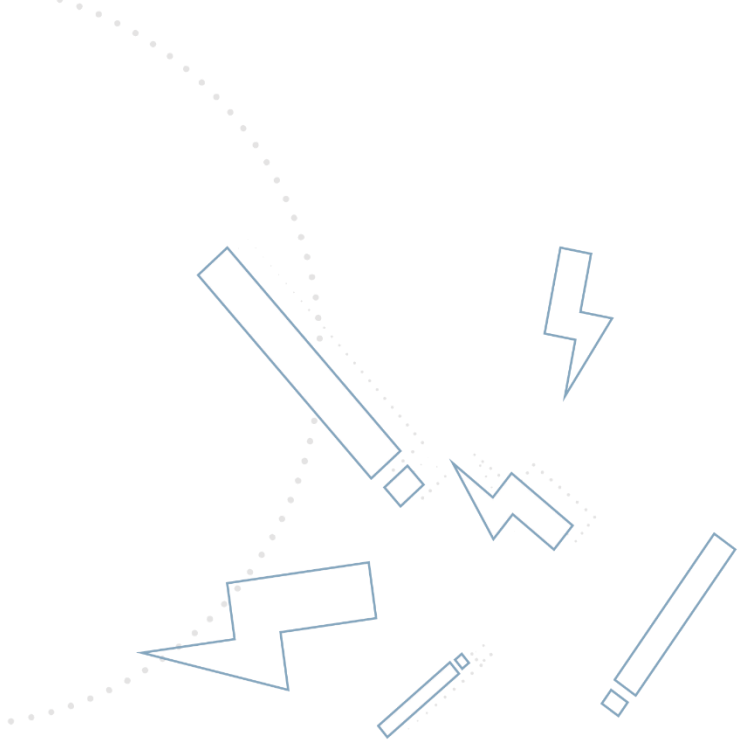
Frameworks have a potential to recognize Gender Equality:

- To combine all aspects, we've identified in the paper
- To raise awareness
- To give a guidance for public or private financing
- To promote special tariffs & business models

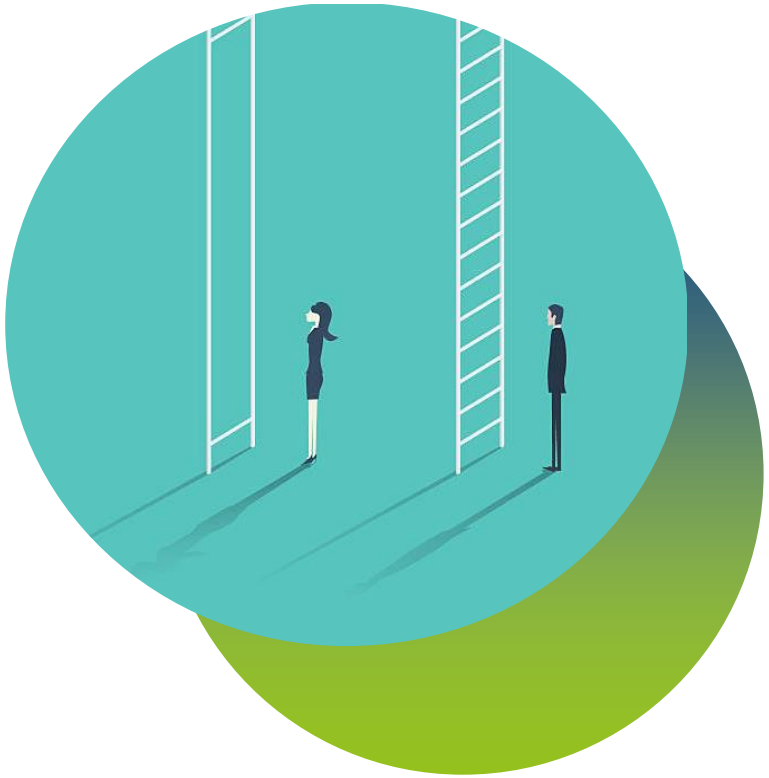


AND WHAT ABOUT THE GENDER ISSUES?

„Based on our research, women tend to park in private parking. On the other hand, women would like to have more charging points at home. Both results could be related to security reasons as the risk of sexual harassment is higher for women in public spaces. From the gender perspective, there are two different dominant patterns and needs associated. This should be adressed when planning charging stations in the future." (SotFH, p. 8)



Results conducted from literature research



- Main inequalities documented in the EU Gender Equality Strategy 2020-2025
  - Such as: gender based violence, gender stereotypes, gender pay gap, gender care gap, gender imbalances in decision-making processes in politics
- Concept of gender inequality mirrored in city and especially infrastructural planning
  - ➔ may be framed as gender bias in infrastructure encompassing prejudiced actions based on the gender-based perception that women are not equal to men in rights and dignity
- Sparsely amount of research concerning gender equality in electric charging infrastructure but noteworthy amount in regards to general infrastructure
  - ➔ approach: transfer performance of current findings to relatively untouched topic of ECI

Source: *Csillak & Kamenz (2022) „Electric charging infrastructure and gender equality – a literature-based overview for User-Chi (H2020 project)"*

Results conducted from literature research

Mobility patterns

- Men displaying longer, more linear travel patterns whilst women often travel shorter distances with more complex travel chains
- Different mobility patterns directly interacting with the concept mobility of care

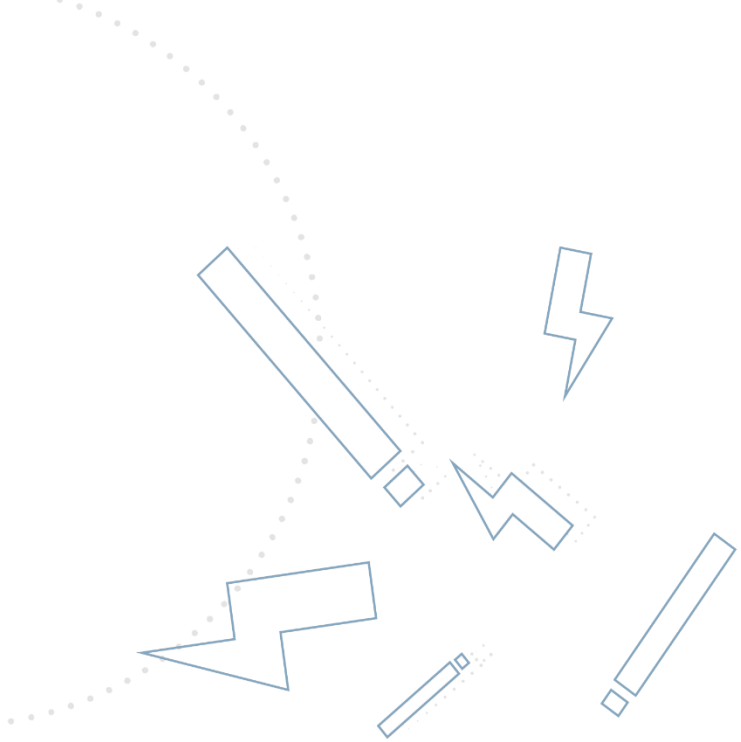
Financial aspects

- Women are less likely to own private electric vehicles
- 27.4 % compared to 72.6 % EVs are owned by men
- Reasons: gender-pay gap, employment in part-time jobs, restricted employment catchment area

Security aspects

- Risk of injuries
- Risk of sexual harassment leading to development of safety mechanisms restricting women from travelling or choosing more extended but safer routes

Source: *Csillak & Kamenz (2022) „Electric charging infrastructure and gender equality – a literature-based overview for User-Chi (H2020 project)"*



Approaches and recommendations in conjunction with the User-Chi project

Planning

Example: CLICK - Planning tool provides recommendations of position, amount and technology for municipalities

<u>Possible ways to recognize Gender Equality in planning:</u>

- Inclusion of gender-sensitive data regarding *mobility of care*
- Inclusion of criteria of neighborhoods regarding *financial aspects*
- Highlighting locations, that follow *specific needs or habits*
- Recommending fast-charging stations regarding *rapid mobility patterns*

CLICK

„**C**harging infrastructure **L**ocat**I**on **C**oncept development **K**it“

Source: *Csillak & Kamenz (2022) „Electric charging infrastructure and gender equality – a literature-based overview for User-Chi (H2020 project)”*

Approaches and recommendations in conjunction with the User-Chi project

Design

Examples:
INSOC - Integrated Solar DC Charging for Light Electric Vehicles
INDUCAR - Inductive Charging for e-CARs

<u>Recognized Gender Equality aspects in design:</u>

- Transport modes (cycling) regarding *mobility of care & local mobility*
- Inclusive design like *roofed, spacious charging point*, possible to add e.g., *storage areas, children sitting areas, parking area for cargo bikes*
- Highlighting locations, that follow *specific needs or habits*
- Wireless charging as *time efficient solution with higher safety*

INSOC

INDUCAR

Station of the Future **Handbook**

Source: *Csillak & Kamenz (2022) „Electric charging infrastructure and gender equality – a literature-based overview for User-Chi (H2020 project)"*

Conclusion

"It remains to be said, however, that the current approach to planning and implementing charging infrastructure projects ***is largely oriented towards the status quo*** *and as a result carries the existing gender bias in the field of general infrastructure on to new fields such as charging infrastructure.*

It can be assumed that in future projects of planning and implementation of charging infrastructure projects, ***criteria leading to an adjustment of gender inequality will be increasingly included.*** *"*

Source: *Csillak & Kamenz (2022): Paper „Electric charging infrastructure and gender equality – a literature-based overview for User-Chi (H2020 project)",*

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