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## Stakeholders, drivers and barriers for local electronics repair: a case study of southern Sweden

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**Keywords:** repair; repair café, electronics; governance; circular cities

**Abstract:** Promoting repair of electronics is an important strategy to slow material loops, particularly of critical raw materials, as part of a transition to a circular economy. This contribution accounts for a case study of southern Sweden conducted in order to examine drivers and barriers for repairing electronics, as well as better understand the roles of different stakeholders. Repair activities in the region were mapped, including professional for-profit repair activities as well as private and public non-profit activities. Structured interviews were conducted with stakeholders representing professional repairers (8), municipal actors (7), second-hand stores (6), and electronics-specific non-profit community repair organisations (2). The organizational structure of repair organisations and the how municipalities currently support repair organizations were also analysed. A survey of consumers was conducted to gauge their attitude towards extending the lifespan and engage with repair activities. The findings indicate that most people surveyed were positive towards repair activities. The professional repairers consider growing consumer awareness as the main driver for increasing repairs, but there remain many barriers. Community driven activities are still in early development and dependent on collaboration with municipal actors. Municipalities emerged as key actors in community repair initiatives, with different municipal departments either initiating, promoting, or supporting repair activities.

### Introduction

The growing consumption of electrical and electronic products has major negative impacts on the environment. The most prominent impacts include energy consumption and leaching of hazardous materials depending on the end-of-life management, but also increasingly resource-intensive manufacturing processes and the extraction of virgin materials (many of which are critical raw materials) (André, 2018). Longer lifetimes for electronic products are beneficial in slowing consumption and avoiding the high impact of extraction and manufacturing processes (Bakker et al., 2014). As a strategy for prolonging lifetimes, repair has been promoted to slow material loops for electronics as part of the transition to a circular economy (Montalvo, Peck, & Rietveld, 2016).

Prior literature has found a variety of barriers to repair of electronics. These include legal barriers, such as IPR infringements by repair activities and use of spare parts (Heath & Sanders, 2009; Svensson et al., 2018), as well as design barriers such as planned obsolescence, lack of modularity and

reparability (Maitre-Ekern & Dalhammar, 2016). Lack of awareness, knowledge, tools, manuals or spare parts can also impede repair activities (McCollough, 2010; Pérez-Belis et al., 2017; Sabbaghi et al., 2017). Repair services can be less competitive than new product purchases when considering the total costs of repair, time and inconvenience (Sabbaghi & Behdad, 2018; Sabbaghi et al., 2016; Wieser & Tröger, 2018). A lack of trust, risk of poor quality service and availability of cheaper new products can also make repair a less attractive option (Camacho-Otero, Pettersen, & Boks, 2017). Others note cultural aspects of a “throw-away society” that make repair less desirable, independent of costs and other barriers (Ahnfelt, 2016; Dewberry et al., 2016; McCollough, 2010; Wieser & Tröger, 2018).

Further empirical evidence from case studies can help to advance the understanding of drivers and barriers for repair in a local context and from different stakeholder perspectives. This contribution focusses on a case study of southern Sweden and maps key repair organisations as well as drivers and barriers for

repairing electronics from their perspectives. We also briefly discuss options for overcoming barriers to increase electronic repair activities.

## Methods

The study used a mixed-method approach and was scoped and designed by the authors. The data collection was conducted by Master's students as part of two research courses at the IIIEE in spring and autumn 2018.

Local repair activities in the region were mapped through a review of online material (e.g. websites of repair organisations) and 23 stakeholder interviews. Structured interviews were conducted with professional repairers (8), second-hand shops (6), municipal actors (7), and non-profit electronics repair organisations (2). Details of the interviews are found in Andersson et al. (2018), Arabi et al. (2018), and Wadsten (2018).

As the non-profit electronics repair organisations were relatively new in the region, these were further analysed to better understand the different types of organisational structures. Similarly, the roles of municipal organisations in supporting repair activities was a gap in previous research, so their roles in repair were further analysed using a framework employed in previous research of municipal roles in promoting environmental agendas (Kern & Alber, 2008; Zvolska et al., 2018).

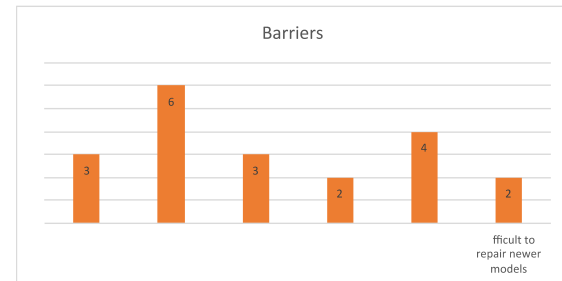
A public quantitative questionnaire survey was carried out in the two cities of Lund and Malmö in southern Sweden. Respondents were approached in several locations in the city centres and were given a chance to win a cinema ticket for participating. The survey was exploratory only as there were only 90 respondents and the method meant there was selection bias (see Andersson et al. (2018) for further details about the survey methods).

## Findings

### *For-Profit Repair Shops*

A mapping of repair shops for electronics in southern Sweden found 114 repair businesses operating in the region. The interviews with for-profit repair shops found that they considered the main driver for repair of electronics to be interest and awareness among consumers; this interest is increasing and half observed an

increasing market. However, there were still many barriers observed, as noted in Figure 1.



**Figure 1. Barriers noted by interviewed repair shop representatives. Source Andersson et al., (2018).**

The majority of representatives had a positive attitude towards DIY and community repair. Many believed that these initiatives raise the awareness of repair opportunities, which are benefiting the repair industry and the environment. Some repair shops could see possible competition between their business and DIY initiatives, but argued that their professional experience was a clear advantage.

### *Second-hand Shops*

Six second-hand shops in Lund and Malmö were interviewed regarding their operation and selling of home electronics and electrical equipment. The larger stores estimated that approximately 30 boxes of home electronics are donated every week. The donations are mainly lamps, but also kitchen tools, stereos and televisions. However, shops estimated as much as half of the donations are broken and cannot be sold. Only one of the stores had a staff member who could repair some electronic products (this requires certification). The products chosen to repair have a high value and feasibility of repair. All other interviewed shops stated that repair activities would not be economically viable. The stores send the electronics that are non-functional or unsellable (e.g. CRT TVs or stock that has been on display for several months) to the recycling system.

A couple of the interviewees said that it is not uncommon for customers to purchase old or faulty electronics, such as "vintage" items and older computers for spare parts. One of the shops recently began allowing a non-profit repair organisation to take non-functioning electronic equipment to try to repair it rather than sending it directly to the recycling system.

### Non-Profit Repair Organisations

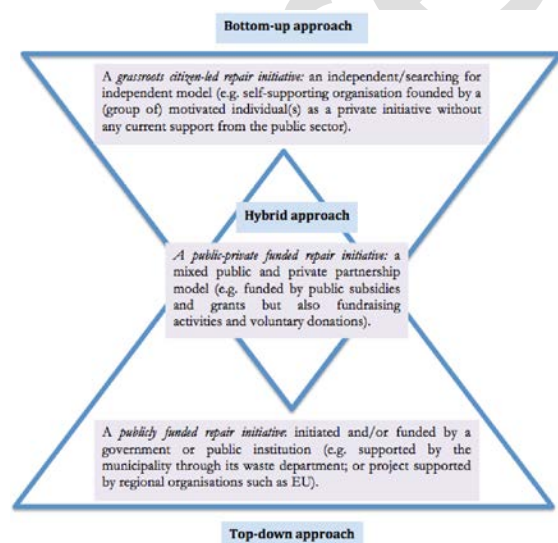
Non-profit repair organisations for repair of bicycles and makerspaces that do minor repair activities have been common for some time in the region, but repair catering to electronic products has only recently emerged. A municipal-led organisation in Lund, FixaTill, began hosting repair activities in 2015. Repair Café Malmö began running occasional events in 2017 and then became an official organisation in August 2018, and began hosting weekly events.

Two different types of non-profit repair organisations were identified in the region based on the following activities:

- 1) repairing *with* people where people bring their products and repair them together with knowledgeable volunteers;
- 2) provision of space, tools and/or spare parts for repair activities

In other regions in Sweden and Denmark, there are additional types of activities, e.g. repairing in exchange for a service, donation or membership fee or repairing for payment to cover costs only (see Arabi et al, 2018).

In addition to the focus of their activities, non-profit repair organisations differed depending on whether they organised from the bottom up (i.e. grassroots), top down (i.e. government/municipality initiated), or a hybrid of these approaches (see Figure 2).



**Figure 2. Types of organisational structures for non-profit repair activities. Source Arabi et al. (2018).**

The majority of the non-profit repair organisations in the region have top-down or hybrid structures. While community repair cafes and repair-oriented social enterprises could be considered bottom-up, the viability of these organisations is still tied to municipal involvement. In addition, the grassroots organisations are linked to umbrella organisations. In this case, Repair Café Malmö is part of both Repair Café International and the Restart Project. The umbrella organisations have influenced the approach and protocols for repair at Repair Café Malmö; for example, that repair is done *with* participants rather than *for* participants, disclaimers about repair activities are displayed by the local organisation but originate from the umbrella organisations, and data is logged on open platforms supported by the umbrella organisations.

### Municipal Organisations

The roles of municipal organisations have been a topic of research in the context of environmental challenges such as climate change (see e.g. Kern & Alber, 2008) and the sharing economy (see e.g. Zvolska et al., 2018). These studies identify four possible modes of municipal governance: initiating, governing by provision, governing by enabling and governing by authority. These modes of governance are also relevant for examining the possible roles of municipalities in repair activities. In this research, municipal representatives were interviewed from five municipalities in southern Sweden: Malmö (2), Lund (2), Vellinge (1), Åstorp (1), and Ystad (1).

### Governing by Initiating

In the initiating mode of governance, the municipality owns, initiates, and is responsible for the repair activities. This mode of governance was identified in the case of Lund, specifically in its waste management department, which promoted reaching an annual municipal waste reduction target of 2% through establishment of FixaTill. FixaTill is physical shop-like space equipped with tools and knowledgeable staff. It also hosts free regular workshops run by external experts, which provide citizens with the necessary infrastructure, tools, and skills to conduct their own repairs and/or upcycling.

In interviews, FixaTill representatives claimed the initiative has been successful, with success measured by participant numbers and surveys on repair attitudes. Citizens have shown great

interest, with many making frequent use of the facilities. The municipality is financing the project for another two years, with a possible prolongation depending on its continued success.

#### Governing by Provision

In this governance mode, the municipality supports repair activities with resources or services. The support can be financial (e.g. grants or salaries), equipment, insurance, and/or space for hosting activities.

The provision can be small and short-term, as in a starting grant. In Lund, for example, the social enterprise “Electronicsmix” received a one-time grant in its start-up phase. In Malmö, “Repair Café Malmö” received a small financial starting grant of €500 from the municipality. Other provisioning is longer term, such as Lund municipality’s funding for FixaTill.

In addition to funding, both Lund and Malmö municipalities also make space and resources in their local community centres “Stenkrossen” and “STPLN”, respectively, which are freely available for repair (as well as creative and upcycling) activities organised by other groups. The activities have to be approved by a governing board established by the municipality and the organisations must have safety training for the venue (e.g. fire safety training). The venues also have insurance for the approved activities. This provision of space and insurance allows Repair Café Malmö to run weekly repair events at STPLN.

The governance mode of provision is highly valued by the repair organisations. Without the provision of grants and space, the repair organisations interviewed said they would struggle to exist in the first place. Yet some still find it challenging to know what types of provisioning they are eligible for and how for how long they can depend on it. Some repair organisation leaders suggested that municipalities could communicate their long-term intentions more clearly, as provisioning was key to the long-term viability and strategies of many repair organisations.

#### Governing by Enabling

This governance mode involves the municipality supporting repairing activities by acting as a communicator, matchmaker, or partner. This includes support in the form of coordination, communication, promotion, public

education, awareness building, and facilitating partnerships.

All the municipalities interviewed identified with this role for the municipality in communicating about repair opportunities and encouraging citizens to engage in repair. This is largely done through channels like the newsletter of the municipal waste company. The municipalities also encourage educational activities in schools and other institutions.

The city of Malmö not only communicates about repair activities in the city calendar and waste newsletters but also brings together key stakeholders such as repair organisations, educators, public institutions like libraries, etc. when it initiates special events such as “FixaGrejen” (“Fix the Thing”) and “FixaJulen” (Fix Christmas).

#### Governing by Authority

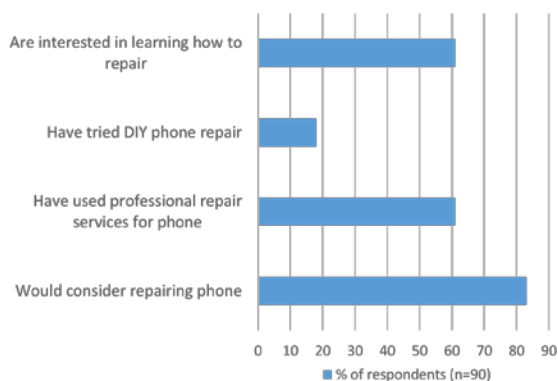
In this governance role, the municipality uses its formal authority to restrict or regulate certain activities through laws and policies. The authority of the local governments is highly influenced by national or international regulations. For example, regulations dealing with health and safety are relevant for electronics repair activities but such regulations are decided at the national level and merely implemented by municipal authorities, with little perceived influence the other way. The same is true for access to potentially repairable e-waste, which is governed by national laws.

However, local policies also set agendas and priorities that influence repair activities. For example, promotion of repair is seen as part of Malmö municipality’s vision to help citizens “maintain a high quality of life despite minimum use of resources” (Malmö City Council, 2009). Currently repair activities are perceived as an environmental activity and only integrated into policies stemming from the waste or environmental departments.

Some interviewed representatives noted the social benefits of community repair could be increasingly relevant for the cities for integration, identity building and resilience. The city of Malmö’s waste department is currently exploring repair activities in more disadvantaged neighbourhoods (currently repair activities mainly take place in a newly built neighbourhood, Western Harbour).

### Consumers

In the survey, half of the 90 respondents had a mobile phone that was 1 year old or newer. The most common reason for buying a new phone was that their previous one broke or that they wanted to modernise.



**Figure 3. Attitudes towards repair of mobile phones in southern Sweden.**

Figure 3 summarises the respondent attitudes towards repair. The majority of respondents said they would try to repair their mobile phone if it broke, but it was often a question of price. Many respondents had never actually brought their phone for repair and those that had repaired their phone did so mainly when the repair was covered by warranty. The majority had never tried to repair their mobile phones by themselves, and the reasons were lack of knowledge and that they did not believe that they could repair a mobile phone. People were largely positive to learn about how to repair their mobile phones by themselves, and thought that having easy instructions and instructional videos available online would help enable this.

### Concluding Discussion

Repair activities are growing in southern Sweden but they are still perceived by all stakeholders to be much lower than their potential. In addition to environmental goals, the municipalities increasingly recognise social benefits in promoting repair, which implies a possible need for integration of repair activities beyond only the waste and environmental departments.

While consumers expressed willingness to engage in repair, almost a third of the surveyed respondents bought a new phone to modernise. This stresses the significance of fashion obsolescence and “throwaway society” culture as a barrier to repair, despite the perceived

growing awareness of repair possibilities. This barrier was mentioned by all stakeholders in this study as a large systemic barrier to repair requiring action on all levels.

Municipalities, for-profit organisations, and non-profit organisations also referred to other systemic barriers such as the lack of eco-designed products and national or international policies to further promote repair. Indeed, such policies are only recently being considered on the EU level (RREUSE, 2015; Svensson et al., 2018). In addition, policies such as VAT reduction for repairs are still limited in scope (in Sweden reduced VAT applies to second-hand stores and repairs of larger equipment by professionals, but only in homes, not electronic repairs in shops). Expansion of such policies could further promote upscaling of repair on a local level, but it remains to be seen which and how different stakeholders are incentivised.

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