

Stimulating circular public procurement

The case of second-life batteries for traction applications



Building Competence. Crossing Borders.

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Circular economy is coming to town

- **CE:** well-established concept for decarbonization and resource efficiency
 - EU's 2nd CE Action Plan (2020)
 - France's new Anti-waste Law (2021)
 - Switzerland's partial revision of the Environmental Protection Act (due 2022)
- **Public procurement:** recognized pathway for supporting circular innovations (Ntsondé & Aggeri, 2021, Alhola et al., 2019)
- **Batteries:** a key sector of the EU's circular ambitions and a crucial element in operations of public organizations like municipalities

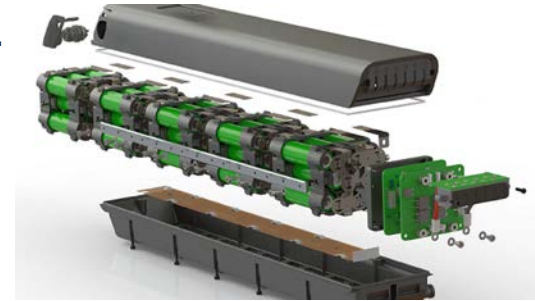
Source: indicereparabilite.fr



Can we do better than recycling?

- Main research and policy focus of CE in batteries so far is **recycling**
 - Well established technologies
 - Acceptance of stakeholders
 - Financing schemes
- What about optimally **extending the life** of batteries, driven by...
 - Technological development
 - Life cycle performance
 - Synergetic potential between recycling and **repurposing**

Source: bike-eu.com



- **Innovation project to achieve integration of second-life batteries and servitization in traction applications**

Integration of second-life batteries into light fleet e-vehicles

Innovation project 2021-2022



EoL e-bikes



Goupil G4

Research



Implementation



Kanton Zürich
Amt für Abfall, Wasser, Energie und Luft

Stadt Winterthur



Support



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Innosuisse – Swiss Innovation Agency



Municipalities as promising end-users...



EnergieSchweiz für Gemeinden

17.6.2022

CORFU 2022



Vaud Modifié le 13 janvier 2021 à 21:11



Lausanne veut bannir tous les véhicules à essence de la ville d'ici 2030



Lausanne a présenté son Plan climat: interdire tous les véhicules à essence en ville d'ici 2030. / 19h30 / 1 min. / le 13 janvier 2021

...what are views related to circular practices of batteries? Online survey of Swiss municipalities in Fall 2021

- Target
 - 89 Swiss municipalities actively engaging in climate and energy initiatives
 - 70% response rate, corresponding to 25% of Swiss population
- Respondents
 - Heads of municipality workshops/public works departments
 - Vehicle fleet managers
- Main survey parts
 - Rate of electrification of small utility vehicles, drivers and barriers for their procurement
 - Attractiveness, drivers and barriers of two circular practices
 - Second-life batteries
 - Servitization of batteries through pay-per use

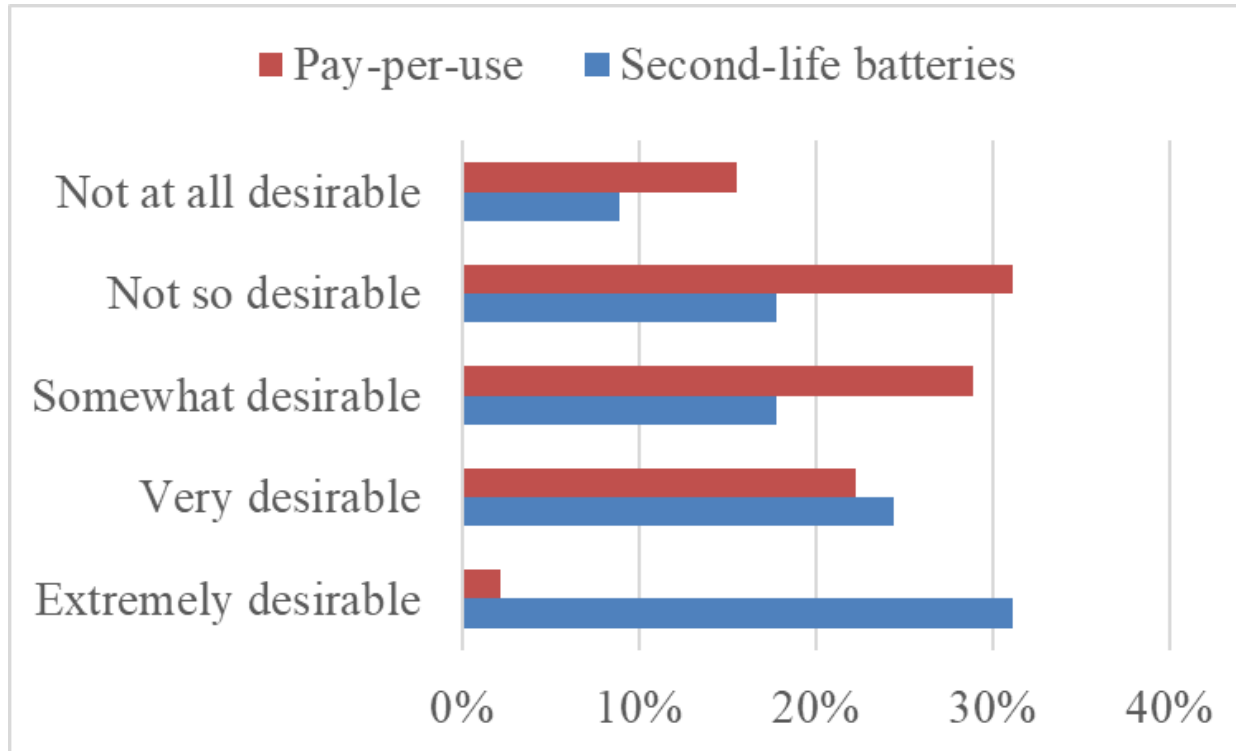
Electrification of small utility vehicles

- 75% already own small electric utility vehicles, 10% are planning to acquire such vehicles (10%) and 15% is not considering this option

Reasons for procuring small electric utility vehicles (n=61)	Percent
Low environmental impact	82%
Low operating costs	39%
Policy support	36%
Improved working conditions	20%
Good prospects regarding battery reliability and costs	16%

Reasons for not procuring small electric utility vehicles (n=61)	Percent
High purchase cost of battery electric vehicles (BEVs)	72%
Limited range of BEVs	67%
Limited choice of small electric utility vehicles	64%
Uncertainty regarding battery lifetime	36%
Need to adapt logistics organization	28%

Attractiveness of two circular practices (n=45)



Top 3 drivers and barriers for implementing two circular practices

Drivers of second-life batteries (n=45)	Percent	Drivers of pay-per-use (n=45)	Percent
Demands from end-users	51%	Initial cost savings	51%
Incentives	38%	Transfer of fixed costs into predictable variable costs	31%
Pilot projects in circular public procurement	24%	Advanced technology adoption and access to associated skills	27%
Barriers of second-life batteries (n=45)		Barriers of pay-per-use (n=45)	
Lack of knowledge	62%	Higher perception of cost of usage compared to total cost of ownership	42%
Lack of a clear definition of circular public procurement	31%	Traditional procurement rules and balance sheet constraints	40%
Organizational distances (physical and cultural) between centralized procurement department and purchasers in the technical services	18%	Institutionalized ways of working and thinking	29%

Discussion

- Municipalities see **batteries** as **main barrier** to electrification
- **Second-life batteries** are the most attractive circular practice
 - Seemingly thanks to absence of organizational change (Fichter et al., 2013)
 - Yet awareness raising and further experience are needed
- Hopefully, **frontrunning municipalities can stimulate** circular procurement
 - First within other municipalities and public organizations (public procurement)
 - Later in the private sector and households
- Role of research: accompany the diffusion by **promoting circularity**

Conclusion

- Overall take-away message
 - Energy transition is engaged with real local benefits of reduced air and noise emissions in cities and towns of Switzerland
 - What about the **circular transition** so crucial to reduce our dependency on resources?
- Survey conducted is not only relevant to Switzerland but **EU as a whole** given the importance of the battery sector in EU CE Action Plan
 - Volumes generated by European frontrunning municipalities would be of significant magnitude and would surely boost the second-life battery manufacturing sector.

References

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Thank you.

