Making urban factories more sustainable through circularity design

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A 3 phases method to integrate local solutions in the development of sustainable urban factories

- **Case study in Grenoble**: reduce **climate change (586 kg CO2 eq)** and **resources consumption (32,100 MJ)** impacts related to the life cycle of an <u>arcade machine</u> over 5 years.
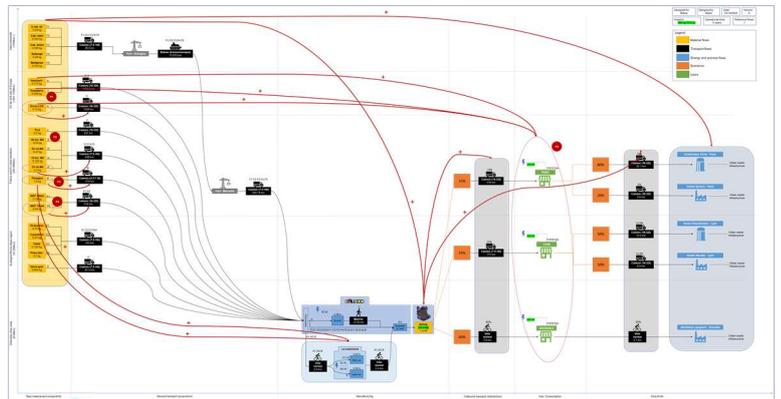
(1) Exploratory phase

Identification of environmental impact hotspots and prioritization (LCA results)

Delimitation of the scope of action on the system's visualization (giga-map)
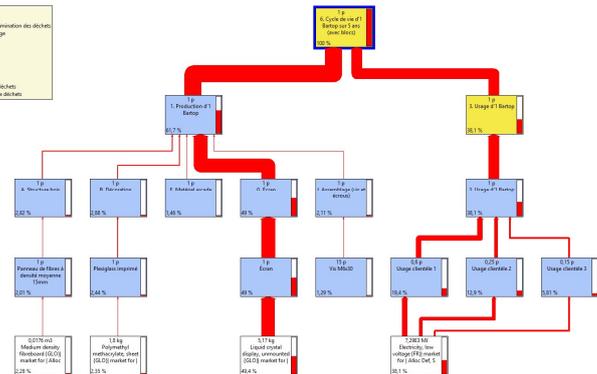
#1: screen, #2: electricity in usage, #3: plexiglass #4: fiberboards, #5: screws

(2) Formative phase

Design of sustainable business models utilizing circularity
(step supported by 3 databases of best practices and patterns)

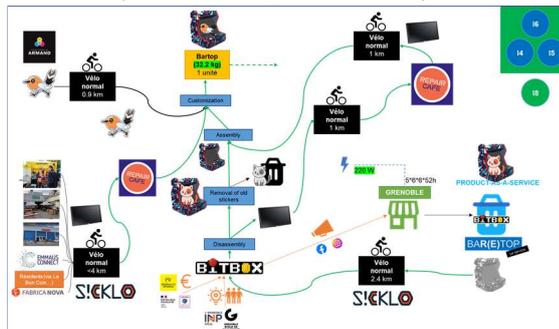3 examples from the 7 designed solutions

(3) Evaluative phase

Evaluation of designed models and prioritization

Analysis and improvement (iteration)

Proposal of a performance monitoring system

Conclusions

- The proposed method has allowed to design circular strategies and business models to act on specific sustainability objectives with regards to the geographic context and the value chain's model;
- The iterative nature of the method has pushed for the design of an additional solution;
- Local stakeholders' engagement has been leveraged to improve the designs' economic feasibility.