reBicycle, the Road to a Sustainable Façade System

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IMPACT

Every year more than 20.000 ton of plastics are burned in Copenhagen alone, meanwhile the Municipality of Copenhagen wants the city to be CO_2 neutral in 2025. In order to succeed, plastics (and other materials) should be reused instead of burned. For each ton of reused plastic, the total CO_2 emission is reduced with 2-3 ton.

METHOD

By collecting metal scraps from construction sites and worn out bicycle tires it has been possible to develop a flexible and versatile façade- and fence-system. The system consists of weaved bicycle tires, fixed to a framing system made from leftover reinforcement bars. Besides the sheltering effect the system also possesses great aesthetic values. The weaved bicycle tires gives a tasteful urban look – and the reflexes on the bicycle tires creates inspiring patterns when light is directed towards the system.

Sustainability

Upcycling and sustainability are two cornerstones in the reBicycle project. Adding functionality to disposable materials and giving them new life - while keeping the energy usage at a minimum is the key to the product.

Vulcanized rubber is the main component in the system. Since it is a thermoset, then it can't be reused (remelted) in a conventional way. However, it can be used in other ways - and therefore it is an obvious choice for an upcycling product.

In Table 1, the Life Cycle Check shows how little energy and virgin materials that are needed for the reBicycle system.

LCA	Materials	Production	Transport	Use	Disposal
Materials	- Vulcanized rubber (reused bicycle tires) - Recycled reinforcement bar - Bolts - Iron tube - Iron plate	- Assembly of consoles - Assembly framework - *Grouting of iron tubes / Mounting on wall*	- Truck - Packaging		- Vulcanized rubber melted in a catalytic process at nearest incineration plant - Remelting of iron for reuse
Energy	- Mining and extraction of iron	- Welding of consoles - Welding of framework - Workshop electricity	- Fuel for truck		- Detaching the rubber from the iron framework
Chemistry	- Electroplating of bolts and nuts		- Used fuel		
Other	- Gathering of materials	- Tools used	- Truck driver		- Tools used

Table 1 Generic LCC Table