

A greenhouse that reduces greenhouse effect

How to create a circular activity with construction waste ?

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 642384.



Waste ?

Resources ?

Tomato Chili project, an example of industrial symbiosis creating financial, social and environmental value.



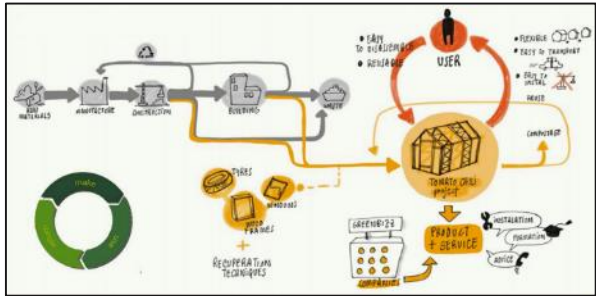
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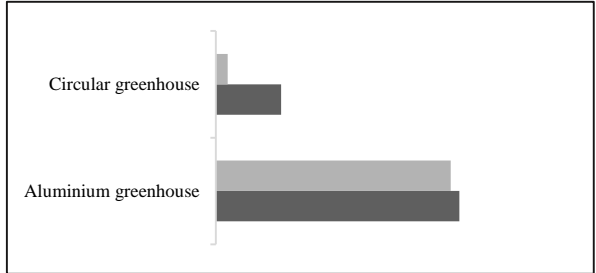
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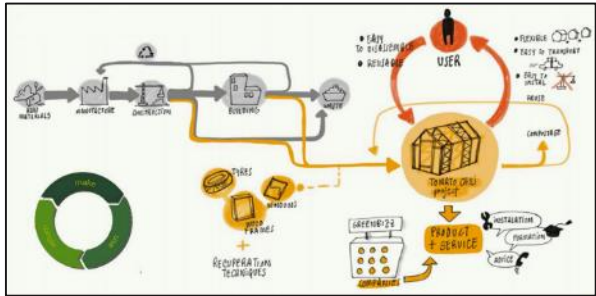
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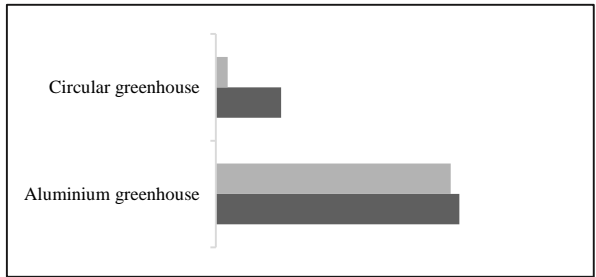
1. “Tomato Chili” project and business model



2. Comparison of environmental impact using Life Cycle Assessment



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The greenhouse is of +95% locally reclaimed materials: formwork wood and window frames.



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The greenhouse is transformable, demountable, and recyclable.



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Thanks to its modular design, the greenhouse can be easily extended according to the client's needs.



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The greenhouse is circular by three main design characteristics

Reuse content,

It is made out of discarded construction materials.

Service life extension,

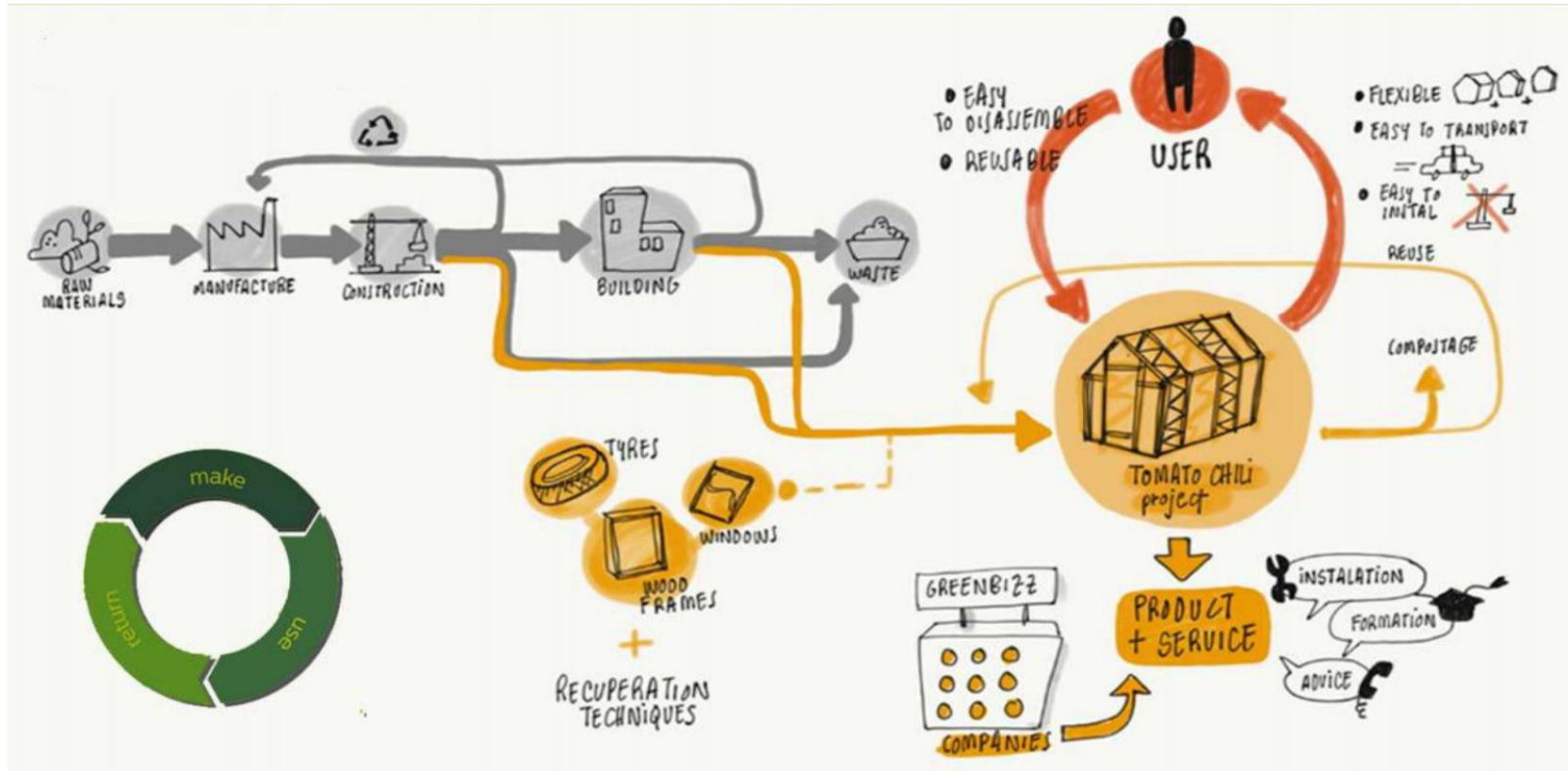
through adaptability and modularity.

End-of-life strategy,

It is designed for a future cascading of materials.



Tomato Chili is an independent business, no longer supported by regional subsidies



Tomato Chili is selling greenhouses and services based on the use of the greenhouse

Customization and 3D simulation; Implementation and sizing advice for the greenhouse,

Start guide to construct the greenhouse by yourself,

Maintenance services in order to keep the greenhouse up-to-date (help of the client in the workshop to learn to paint a layer of wood protection),

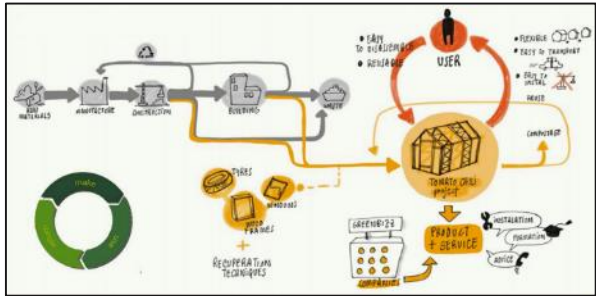
Coaching to grow by yourself vegetables and fruits (permaculture training),

Help for the group purchase of seeds,

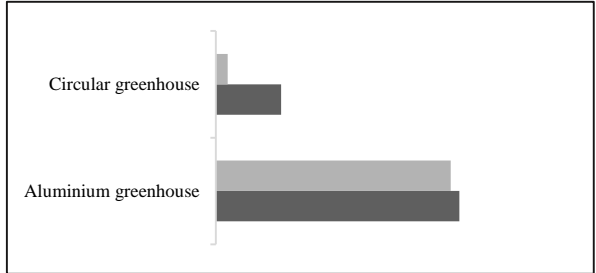
Team building sessions (well-being at work) in partnership with [Skyfarms.be](https://www.skyfarms.be),

Networking and practical information for disassembly, re-use or recycling at end of life,





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2. Comparison of environmental impact using Life Cycle Assessment

Life cycle assessment (LCA) estimates the material flows involved in the **production, use and waste treatment** of a product.



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Life cycle assessment (LCA) estimates the material flows involved in the production, use and waste treatment of a product.



What?

9 m² greenhouse with transparent walls and roof

How long?

15 years of use

Where?

in Brussels

The circular greenhouse was compared to an aluminium greenhouse.



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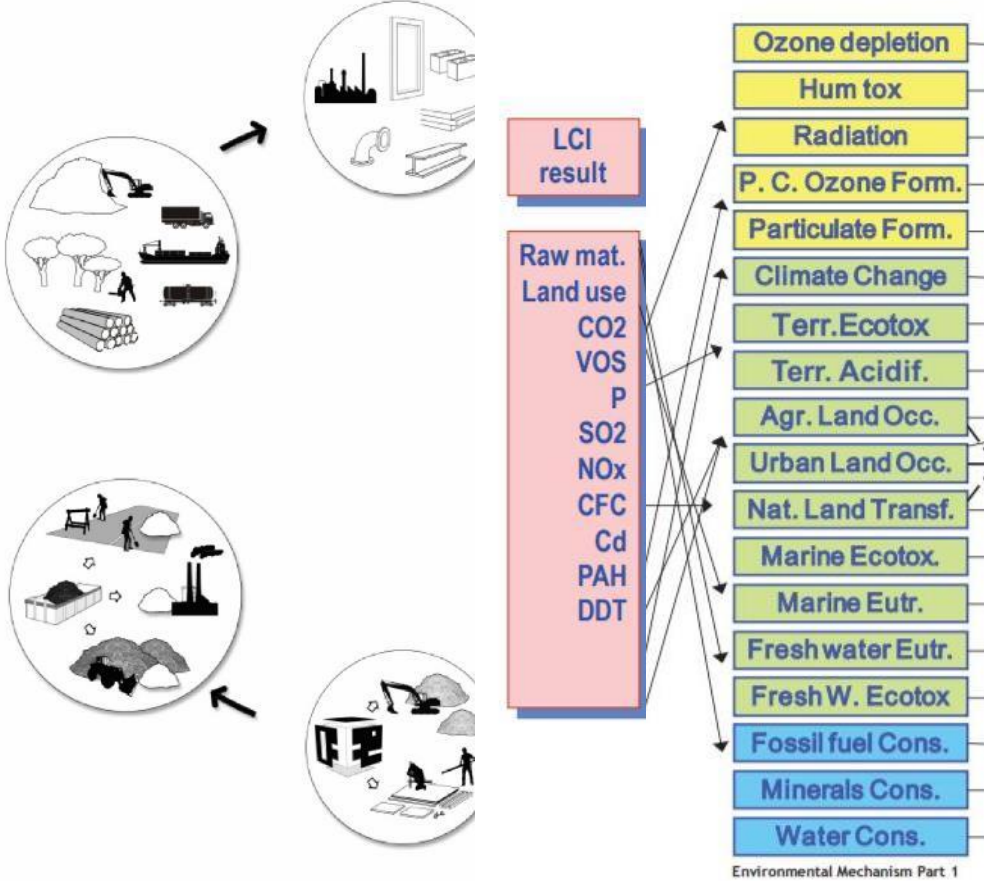


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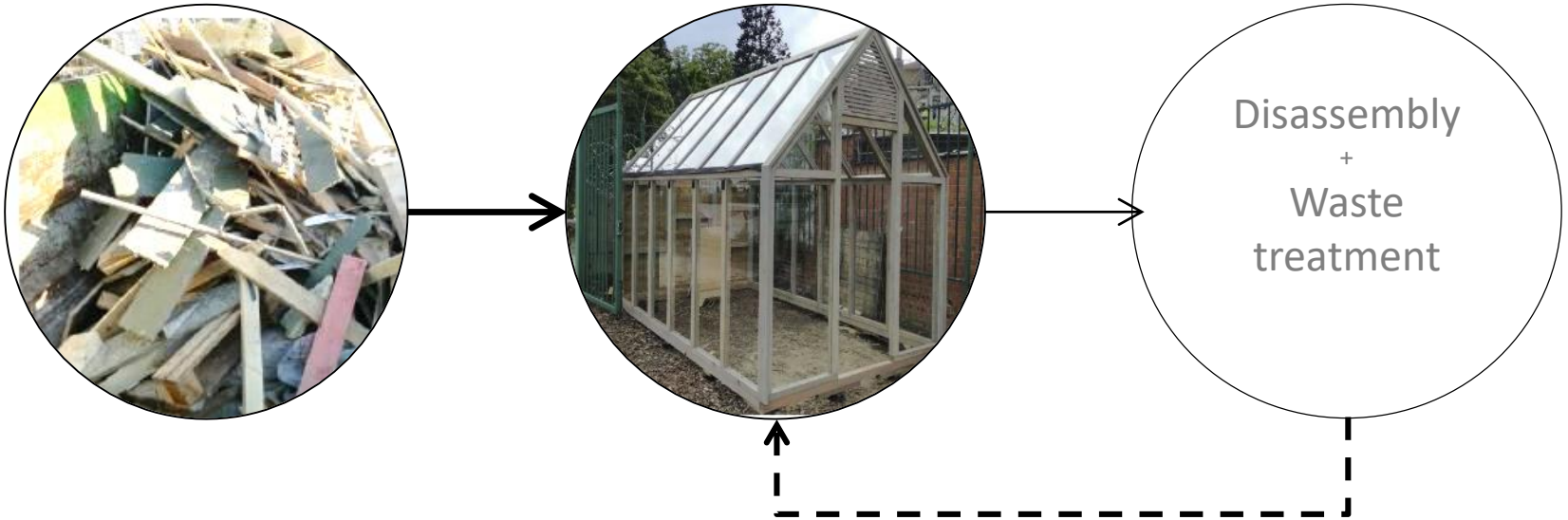
These material flows are associated with **potential environmental impact**, through indicators (climate change, land use, resource depletion,...).



Environmental Mechanism Part 1



There is no real consensus on how to model the LCA of 'circular' products.



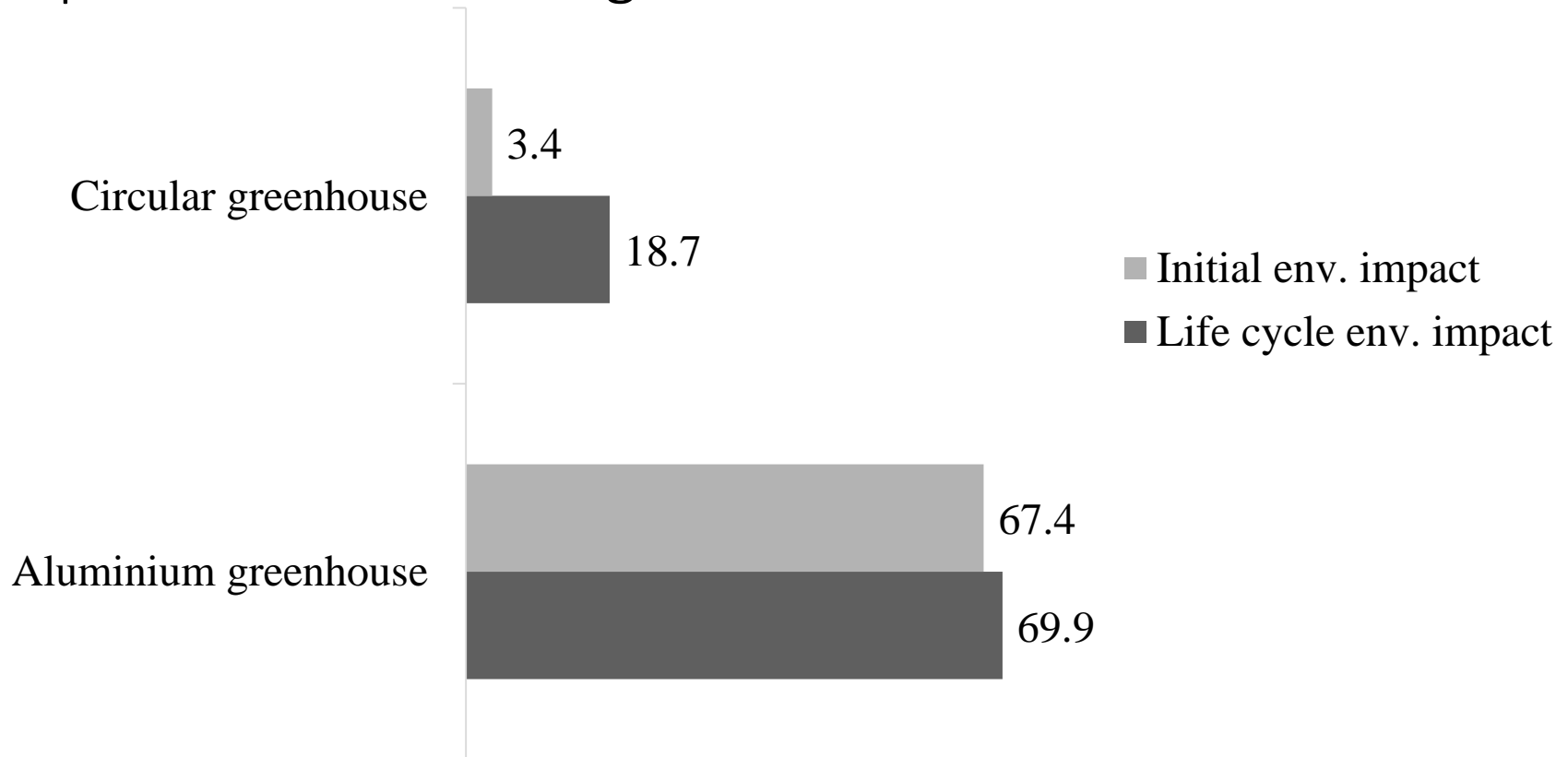
No impact for production of the reclaimed materials

Impact of the maintenance

Reuse of glass panels at end-of-life

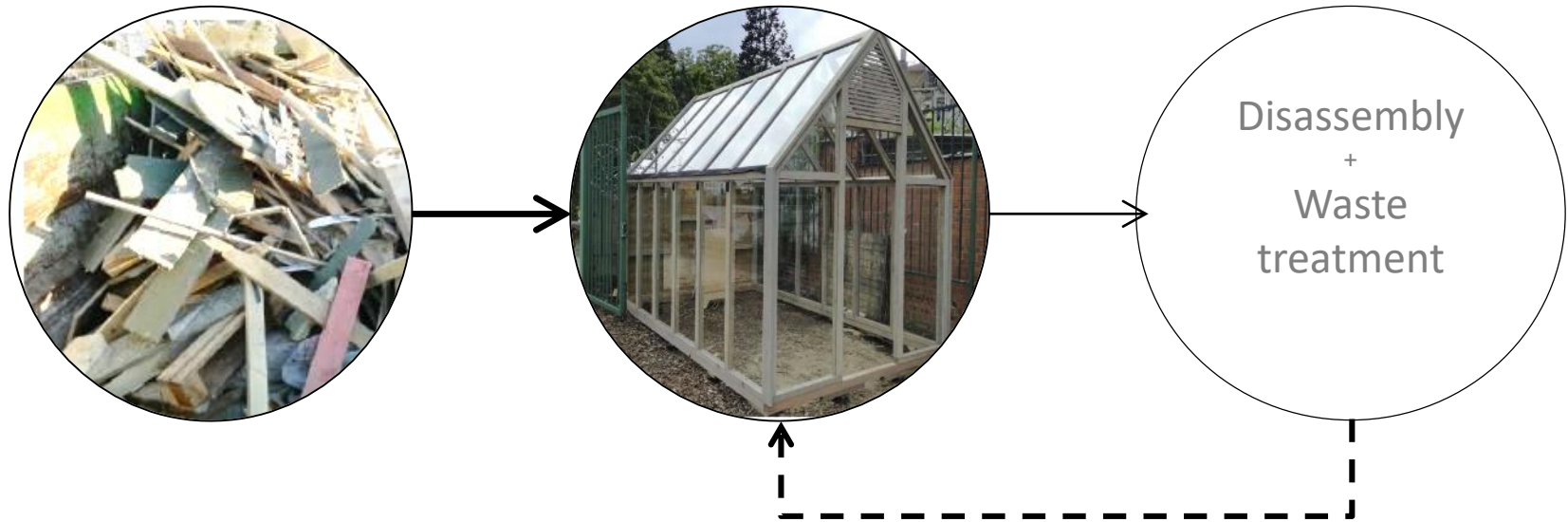
Impact of for remanufacturing

1 aluminium greenhouse generates more environmental impact than 3 circular greenhouses.



Preliminary LCA realised with SimaPro 8, based on Ecoinvent v3 databases. Method: ReCiPe Endpoint (H) V1.12 / Europe ReCiPe H/A / Single score / Excluding infrastructure processes. Unit: ReCiPe Points

We checked the sensitivity of the results to lifespan length and maintenance pace.



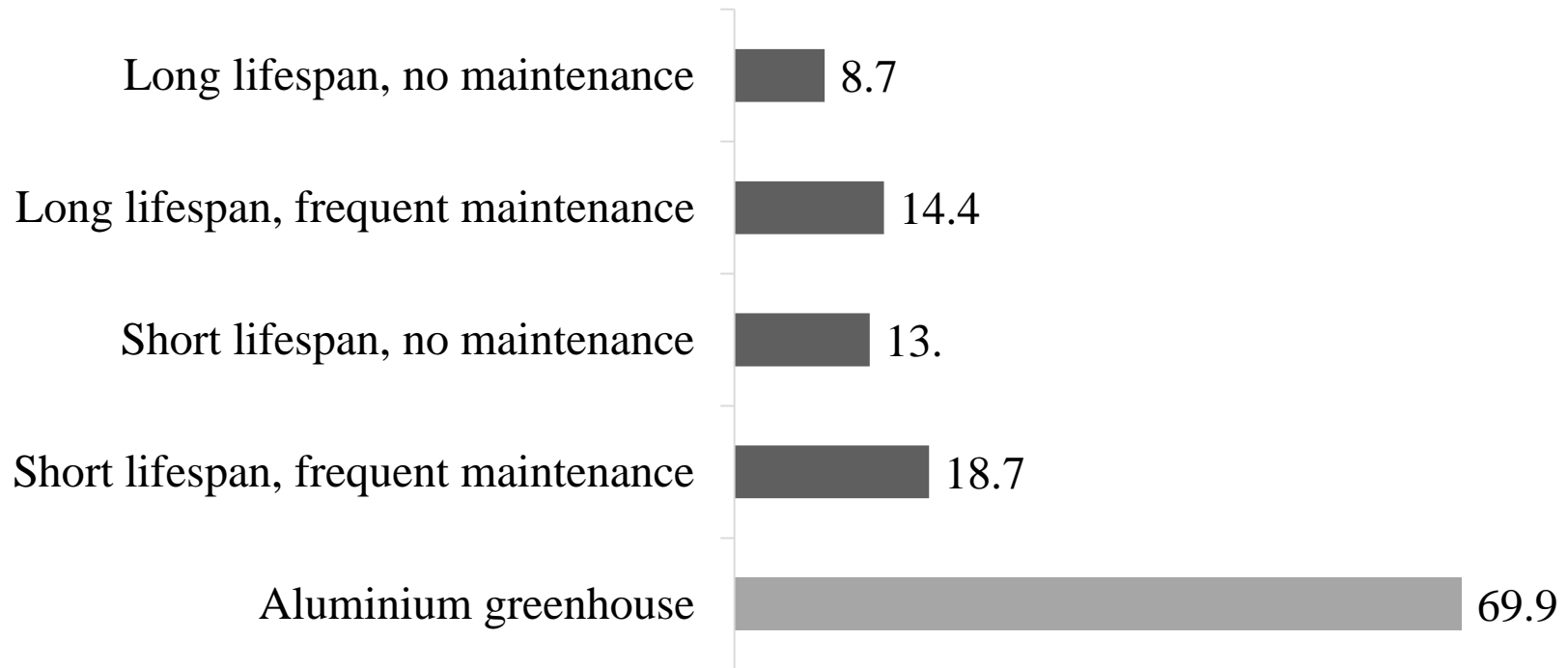
Reclaimed materials

Maintenance

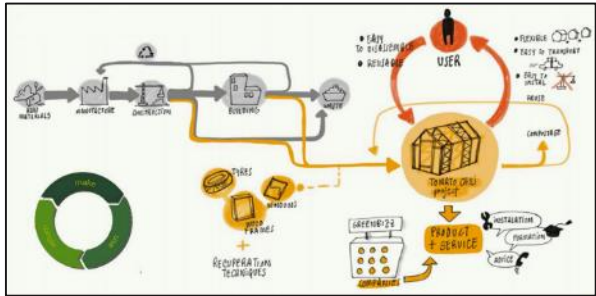
Partial re-use

Lifespan = ?
Maintenance = ?

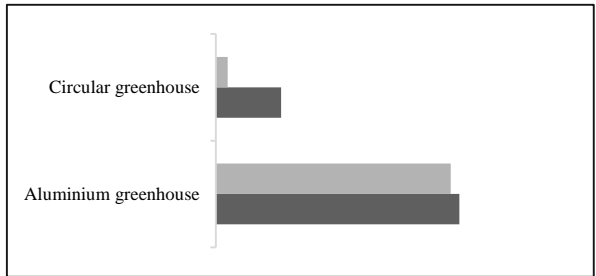
With a long lifespan length and no maintenance, the circular greenhouse has environmental impacts 8 times lower than the aluminium greenhouse.



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Contact

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