

PV systems with lower Environmental Impact: New strategies and analysis tool

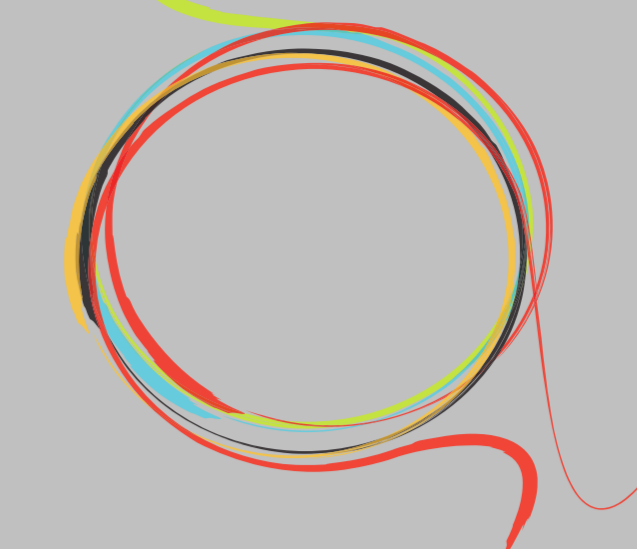


Presentation of the results obtained during the development of two European research projects within the FP7 for the optimization of the environmental performance of PV systems:

- **ZeroWIN** defines strategies for the prevention of waste and the carbon footprint based on industrial symbiosis. The strategies were implemented in two PV systems.
- **LCA to go** develops a free, user-friendly web based tool for dissemination of LCA among SMEs. The beta version for PV is currently available at [lcatogo.simplle.com].

The LCA to go tool was used to define an Environmental Product Declaration (verified by Fraunhofer IZM) for one of the PV system implemented within the ZeroWIN project.

The results showed that the **embodied greenhouse gas emissions associated to the system are 4.377,5 kg CO₂-eq** and its **energy payback time is 2.2 years**.



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LCA to go



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Strategies for PV systems with lower environmental impact

INDUSTRIAL SYMBIOSIS

D4R (Design for Recycling, Repair, Refurbishment and Reuse)

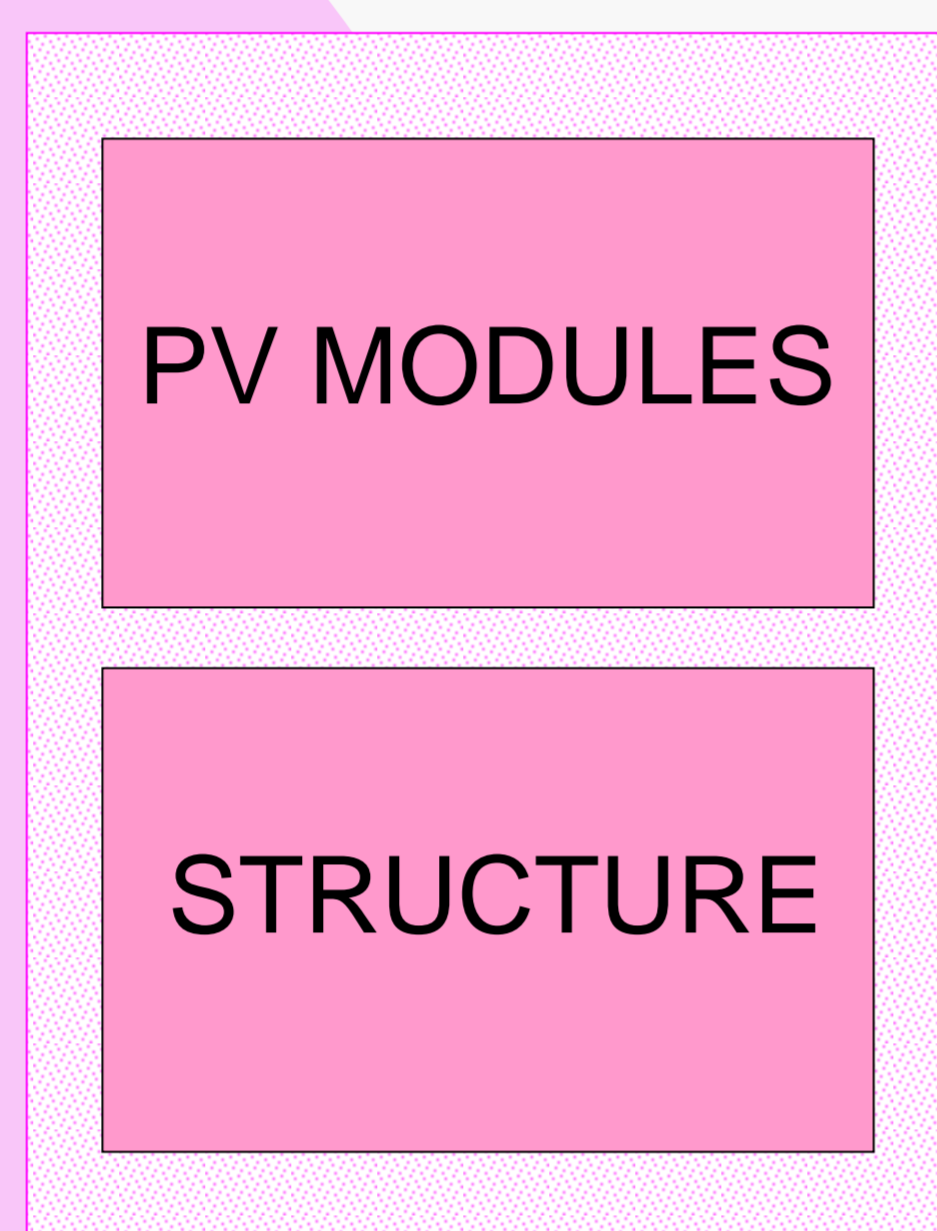
PV MODULES:

Off- specifications

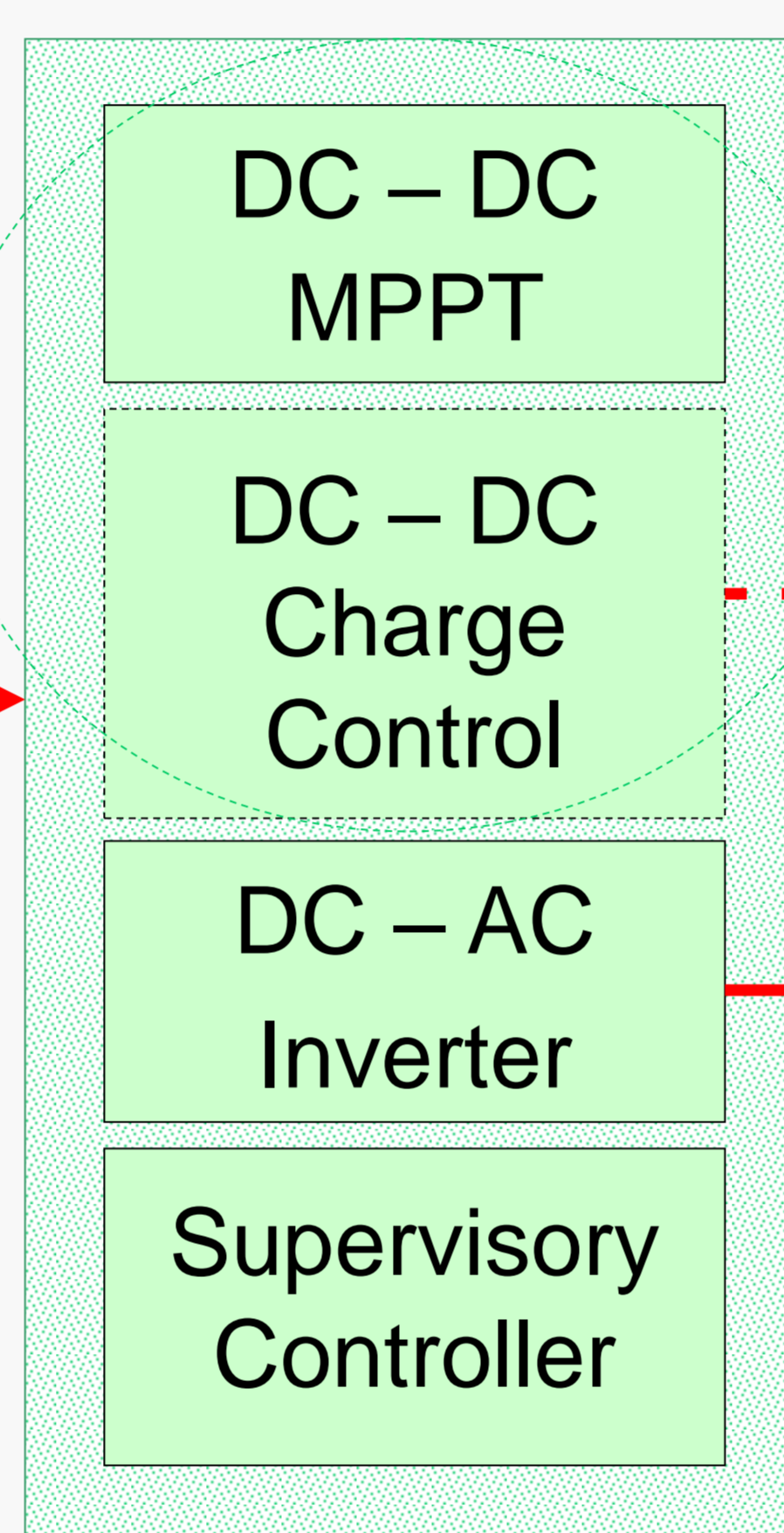
STRUCTURE:

Use of Reused materials
Use of screws for future disassembly

PV ARRAY



POWER CONDITIONING



OTHER BoS

Cabling
Conduits
Protections
Instrumentation
(...)

BATTERY

LOADS

Cabling, protections:

Reuse of components

BATTERY:

Li-ion battery (lifetime 2x lead-acid)
Modular design
With Battery Management Module



POWER CONDITIONING:

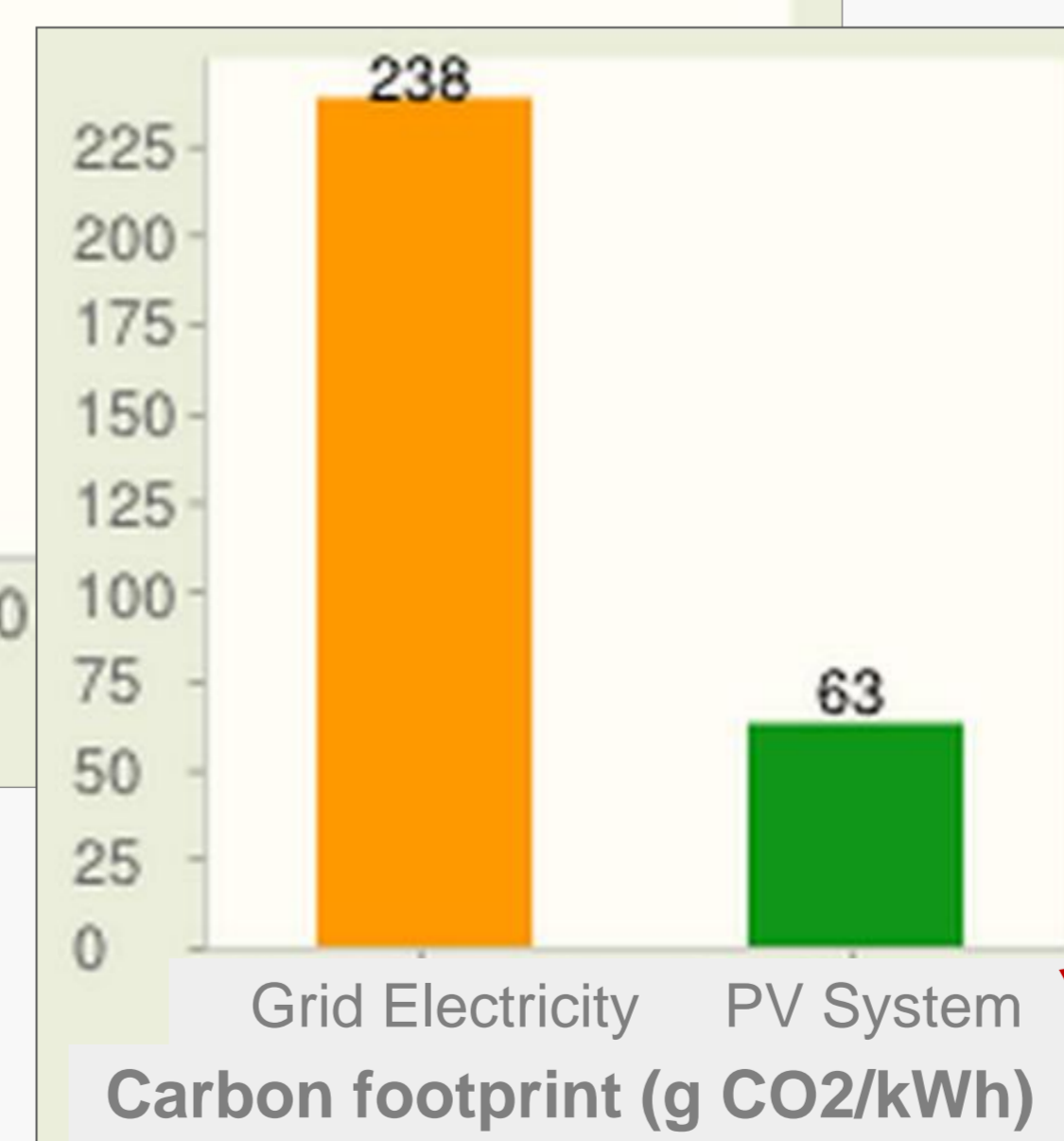
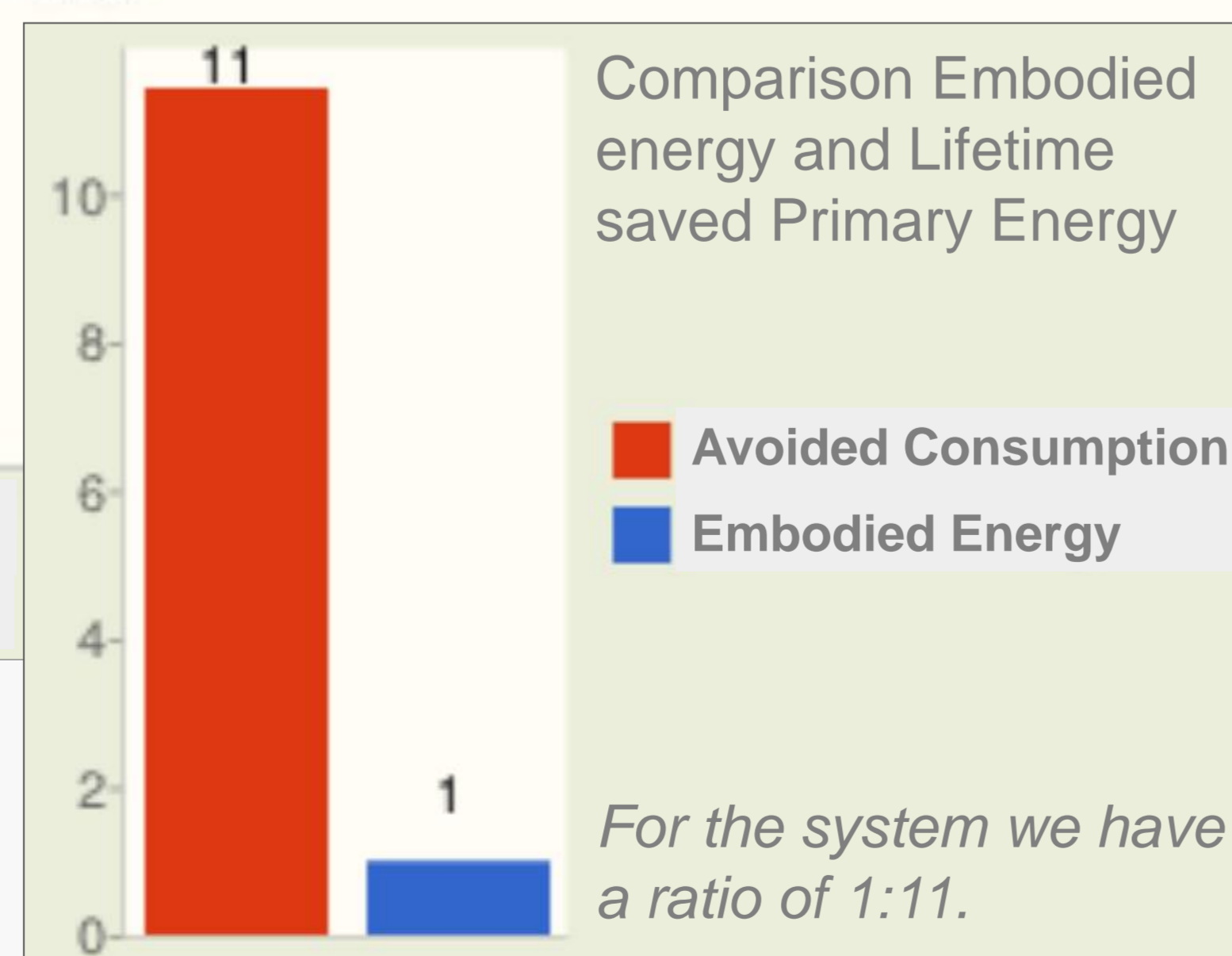
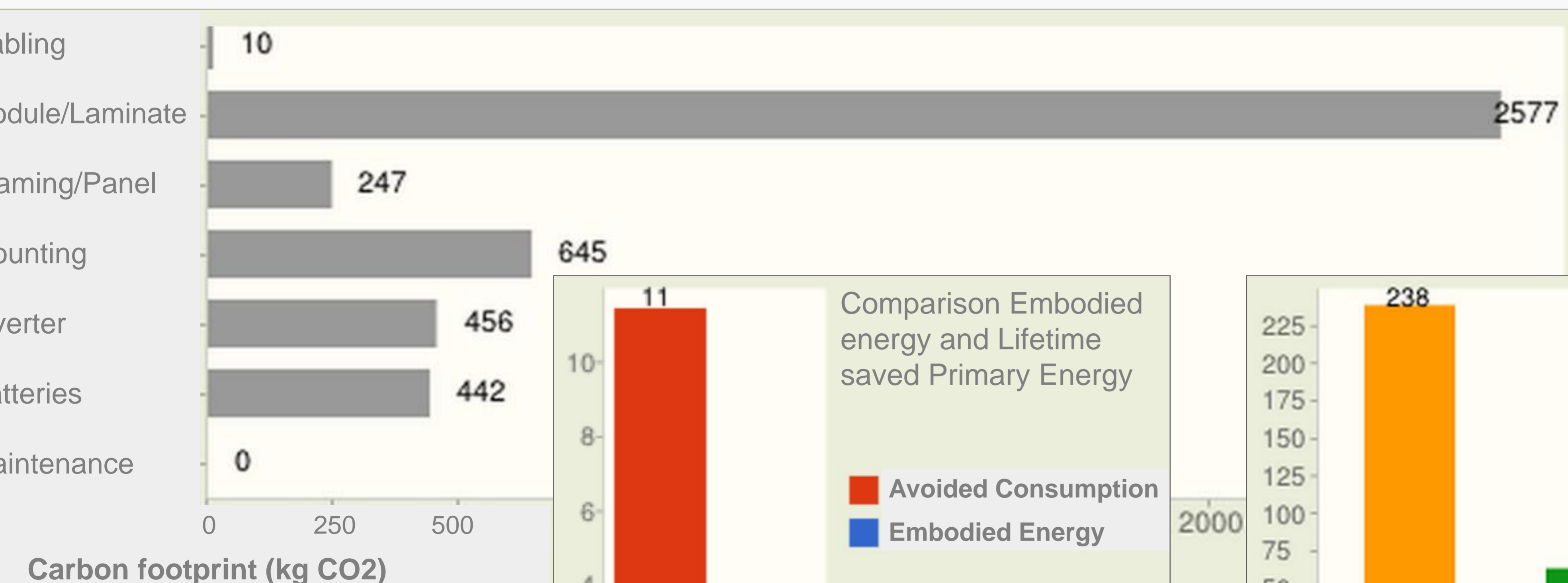
Modular design

Advanced strategy of use: compatibility of stand-alone operation with grid-connection - to be adapted to legal framework and load profile which can be changing with the time



Previous use

Current use



RESULTS: PV SYSTEM	
Embodied energy	66.677,9 MJ PE
Embodied CO ₂	4.377,5 kg CO ₂ - eq
Energy payback time	2,2 years
Lifetime saved Primary Energy by replaced electricity	761.727,3 MJ
Net saved CO ₂	12.240,8 kg CO ₂ - eq

Verified Environmental Product Declaration

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