Supplementary Materials

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S1. Introduction

S1.1 Life Cycle Assessment on composites

Table S1: LCA studies on composites. C-LCA=comparative LCA; A-LCA=Attributional LCA.

Ref.	Materials	Application	Type of LCA	Impact assessment	System Boundaries	EoL
[1]	Steel and CFRP	Automotive	C-LCA	Eco-Indicator 99 aggregation	cradle to grave	Incineration
[2]	Steel and CFRP	Automotive	C-LCA and life cycle energy	Not clear	cradle to grave	Thermal recycling
[3]	CFRP waste	Not specified	C-LCA	impact 2002+	EoL	Pyrolysis, Incineration with energy recovery and landfilling
[4]	DL-PU panel, ABA-Cotton panel, DL-cotton panel	Automotive	C-LCA	CML 2002	cradle to grave	Landfill and incineration with energy recovery
[5]	Lightweight materials	Automotive	C-LCA	CML-IA	cradle to grave	Incineration, open-loop recycling and closed-loop recycling
[6]	CFRP	Not specified	A-LCA	CML 2000	cradle to grave	Chemical recycling
[7]	CFRP waste	Automotive	C-LCA	Not clear	EoL	Landfill, incineration and mechanical recycling
[8]	Composite waste	Not specified	C-LCA	EPD	EoL	Chemical and mechanical recycling
[9]	Aluminum alloy and CFRP	aviation	C-LCA	Eco-Indicator 99 aggregation	cradle to gate + EoL	Thermal treament (pyrolysis)
[10]	CFRP waste	Not specified	C-LCA	Not clear	EoL	Landfill, incineration, mechanical recycling, pyrolysis recycling, fluidized bed recycling, and chemical recycling
[11]	Biopolymer derived from FDCA	Not specified	environmental assessment	ReCiPe mid-point	cradle to gate	NA
[12]	Glass fiber composite and hybrid composite	Automotive	C-LCA	US EPA TRACI2.1	cradle to grave	Landfill
[13]	CFRP waste	Not specified	C-LCA	CML-IA; ILCD 2011 midpoint	EoL + cradle-to-grave (two cycles)	Thermolysis recycling and landfill +incineration
[14]	Kenaf and glass fiber reinforced cement	Construction	C-LCA	BEES	cradle to grave	Landfill
[15]	Polyurethane and rockwool filled composite	Construction	C-LCA	CML-IA	cradle to grave	Dismantle of material, reuse, recycling and storage
[16]	Miscanthus carbon based composite	Automotive	C-LCA	US EPA TRACI2.1	cradle to grave	Landfill

S2. Results

The following section provides additional information on the analyses shown in the main paper. In particular, it provides the normalized LCA results according to the normalization factor by [17].

S2.1 Normalized LCA results

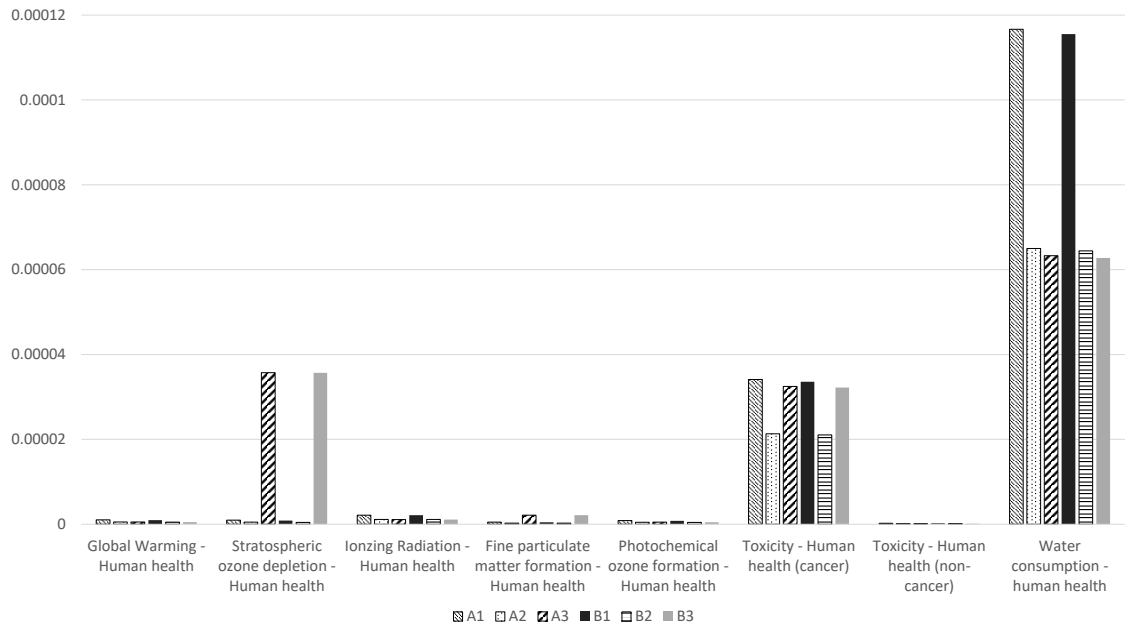

Figure S1: Normalization of LCA results of the six scenarios - human health.

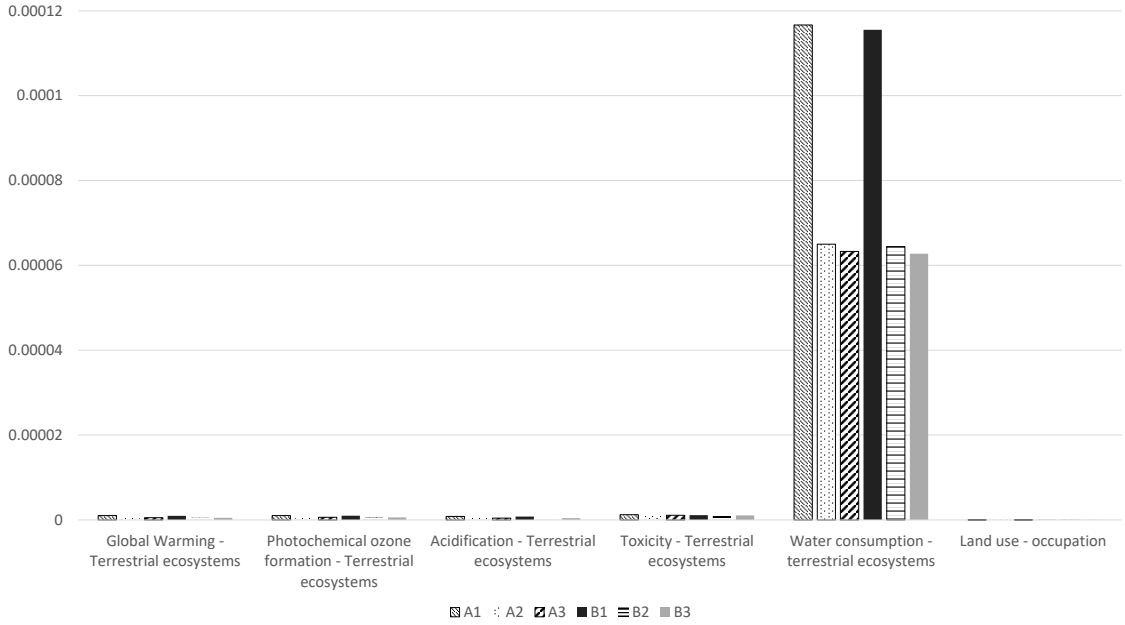

Figure S2: Normalization of LCA results of the six scenarios - terrestrial ecosystem.

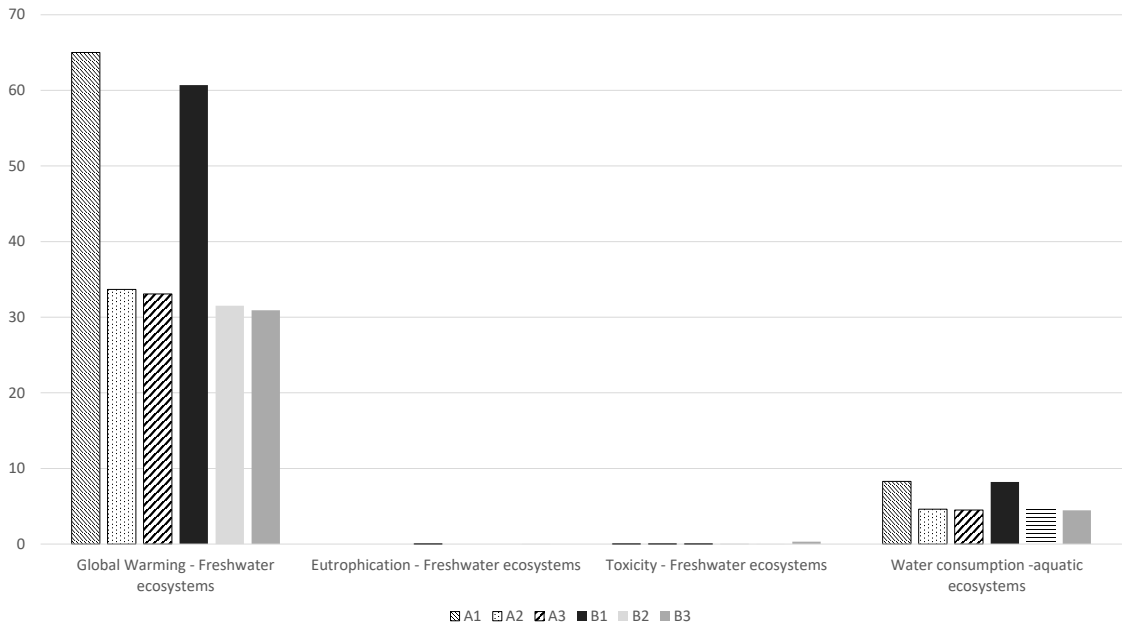

Figure S3: Normalization of LCA results of the six scenarios - freshwater ecosystem.

S2.2 Normalized LCA results for each scenario

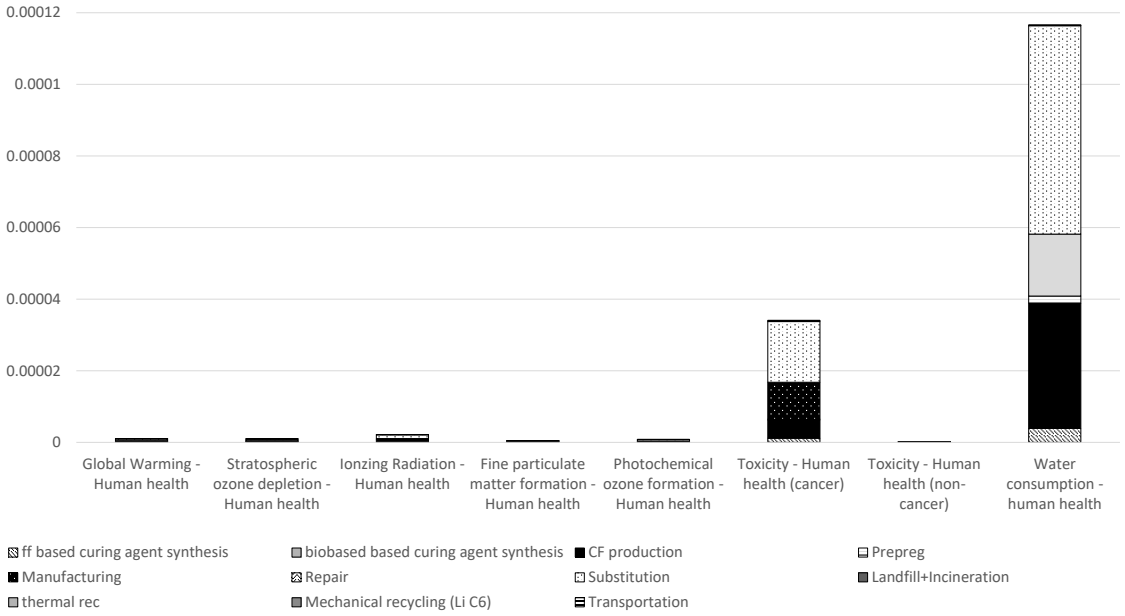

Figure S4: Normalization of LCA results of scenario A1. Water consumption and Toxicity are the two categories with higher environmental impact. CF production, manufacturing and substitution are the steps with highest contribution.

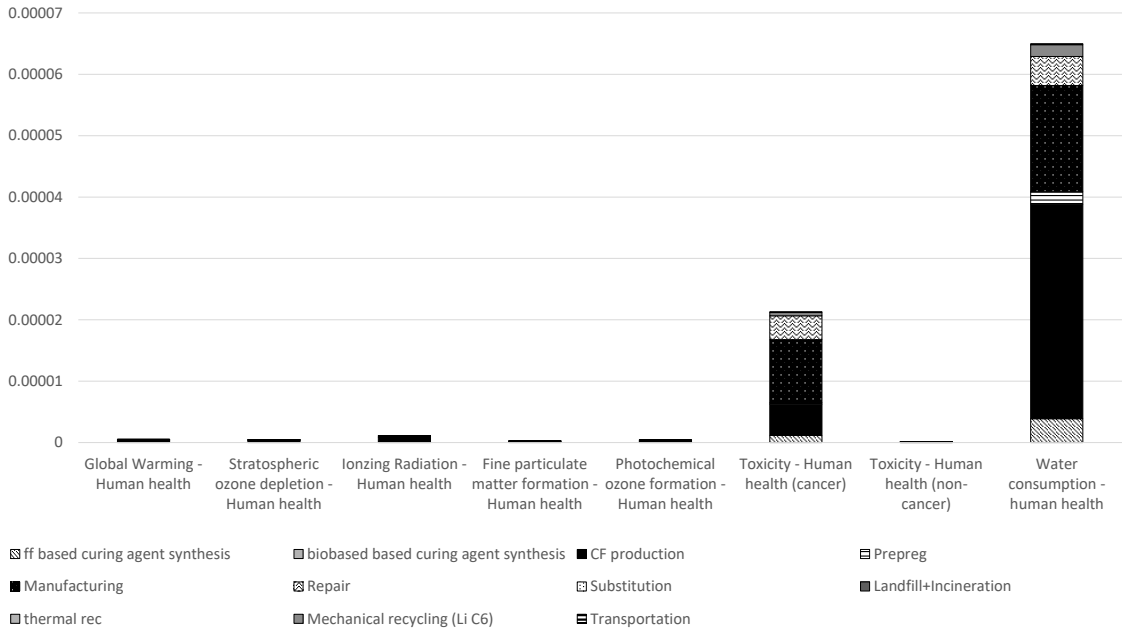

Figure S5: Normalization of LCA results of scenario A2. Water consumption and Toxicity are the two categories with higher environmental impact. CF production and manufacturing are the steps with highest contribution

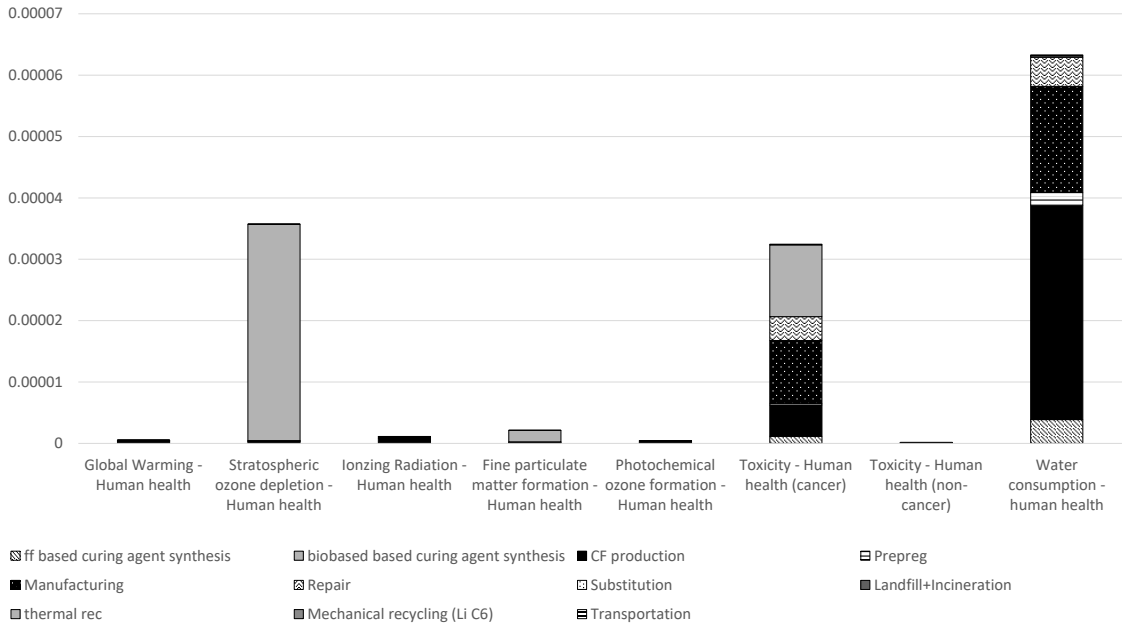

Figure S6: Normalization of LCA results of scenario A3. Stratospheric ozone depletion,Water consumption and Toxicity are the two categories with higher environmental impact. CF production, manufacturing and thermal recycling are the steps with highest contribution

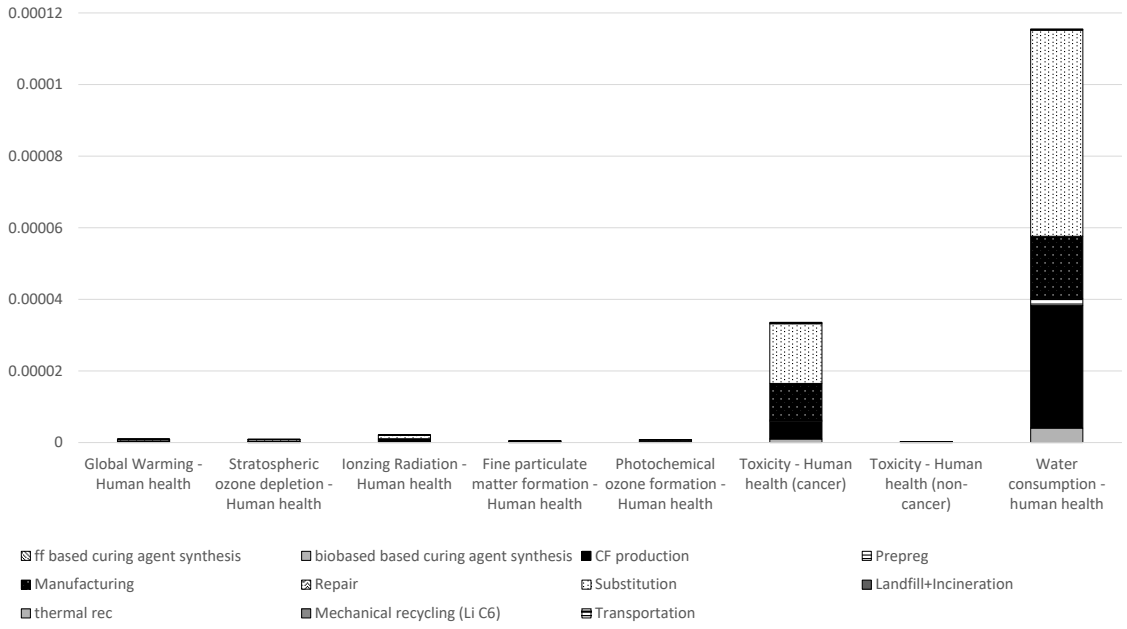

Figure S7: Normalization of LCA results of scenario B1. Water consumption and Toxicity are the two categories with higher environmental impact. CF production, manufacturing and substitution are the steps with highest contribution.

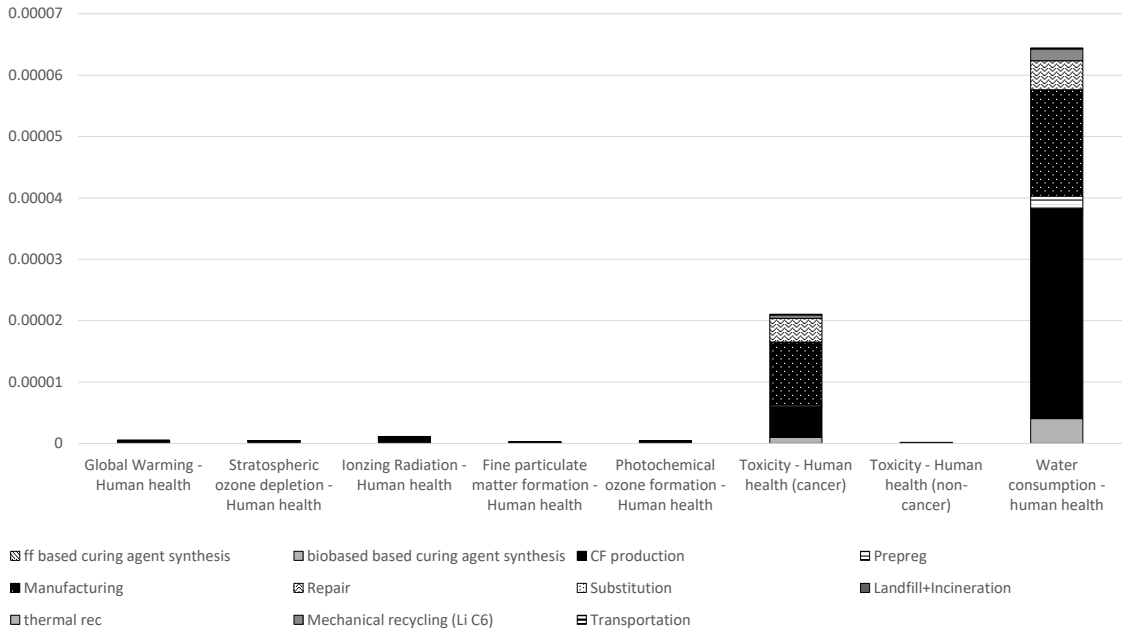

Figure S8: Normalization of LCA results of scenario A2. Water consumption and Toxicity are the two categories with higher environmental impact. CF production and manufacturing are the steps with highest contribution

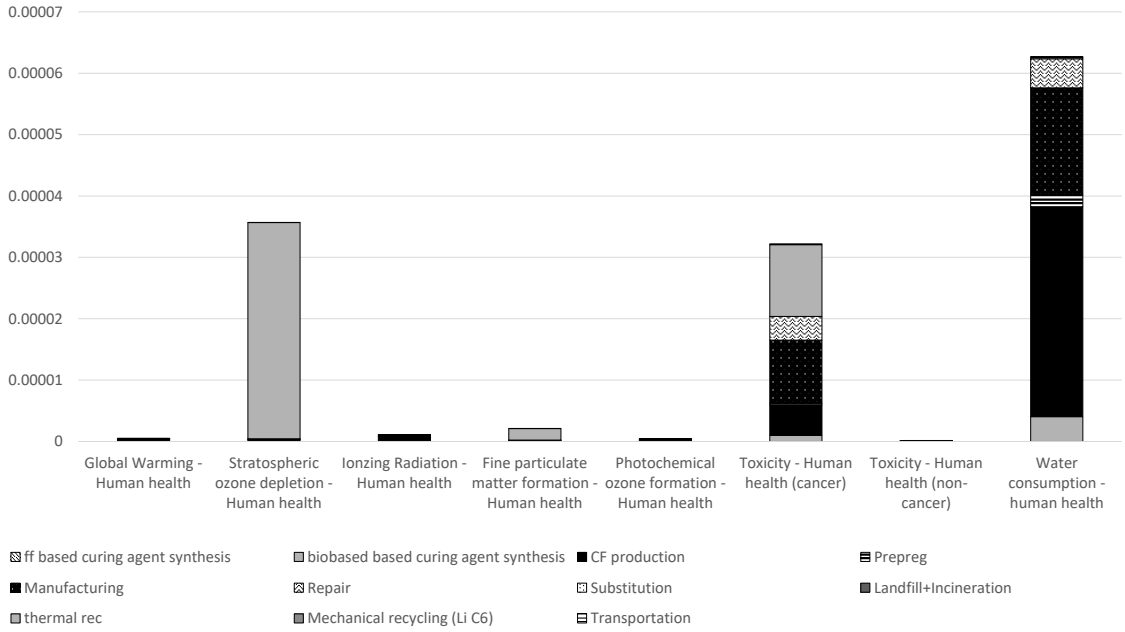

Figure S9: Normalization of LCA results of scenario A3. Stratospheric ozone depletion,Water consumption and Toxicity are the two categories with higher environmental impact. CF production, manufacturing and thermal recycling are the steps with highest contribution

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