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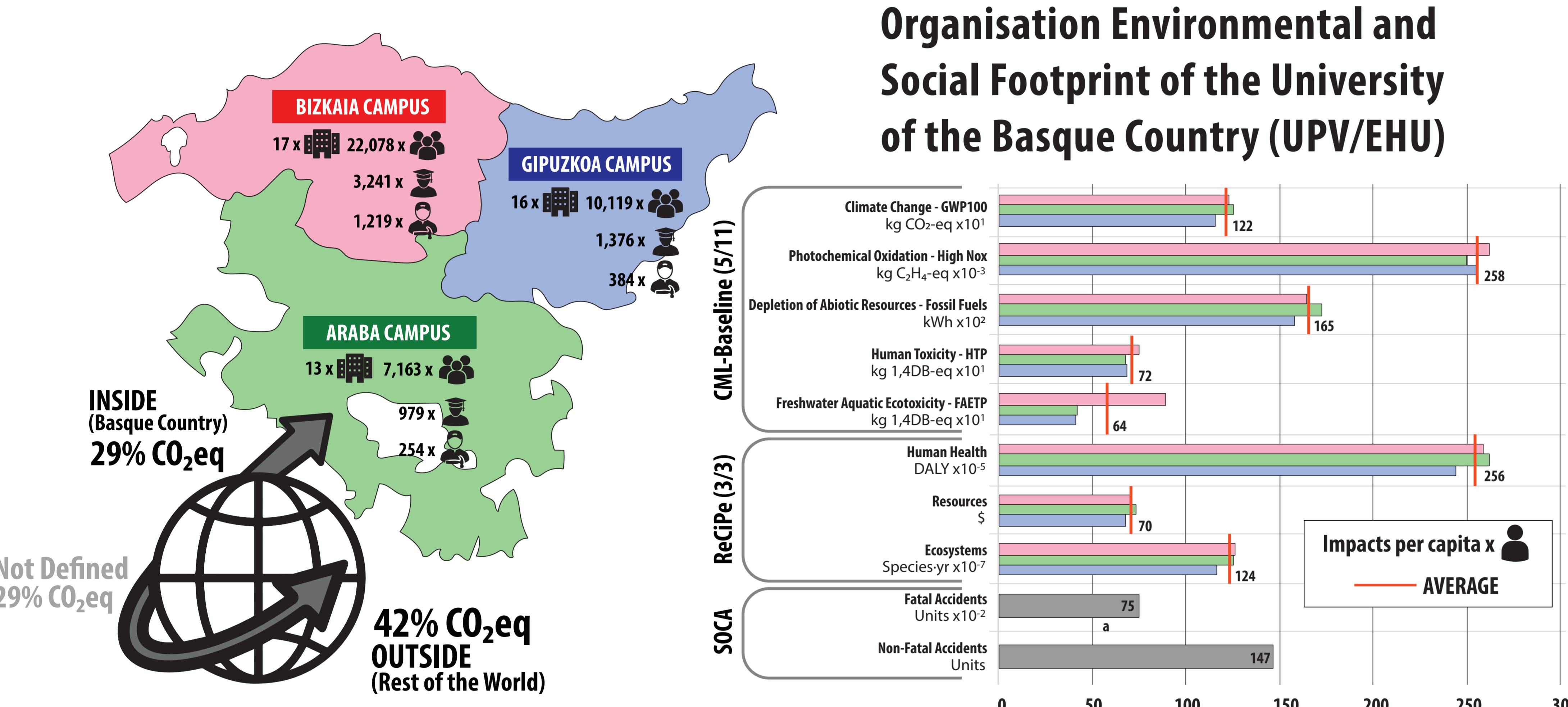
1. INTRODUCTION

RESEARCH CORE: the calculation of the organisational environmental and social footprint derived from the academic activity of the UPV/EHU in 2016.

GOALS: 1) to monitor its performance for a reference year; 2) to identify the environmental and social hotspots related to its academic activity; and 3) to explore some alternative scenarios to reduce impacts.

NOVELTIES regarding literature review: 1) Not only environmental impacts derived from the academic activity of a Higher Education Institution (i.e. UPV/EHU) are included, but also social impacts. 2) Transport needs and all phases of Life Cycle Assessment (LCA) methodology have been considered, including impacts due to building construction.

CONTEXT: a project (EHU-Aztarna) funded by the Sustainability Directorate and the Educational Advisory Service, which involves a multidisciplinary team formed by teaching and research staff, administration and service staff and students.



2. METHODOLOGY

APPROACH: Organisational LCA

GUIDANCE: UNEP/SETAC Life Cycle Initiative's guidance and the European Commission's Organisation Environmental Footprint (OEF) Guide.

SOFTWARE: openLCA

DATABASE: ecoinvent v3.3 with PSILCA-based Soca v1 add-on.

GOAL AND SCOPE: Academic activity in buildings (~45,000 users, ~97% total) in 2016.

INVENTORY OF FLOWS:

Inventory of flows of energy consumption, material consumption, waste generation and transportation that support the academic activity of the UPV/EHU in 2016; strategy followed to collect the data, when not obtained by direct measurement (^B Service provider/Bills, ^S Survey/Interviews, ^P Projection from other faculties, ^G Educated guess).

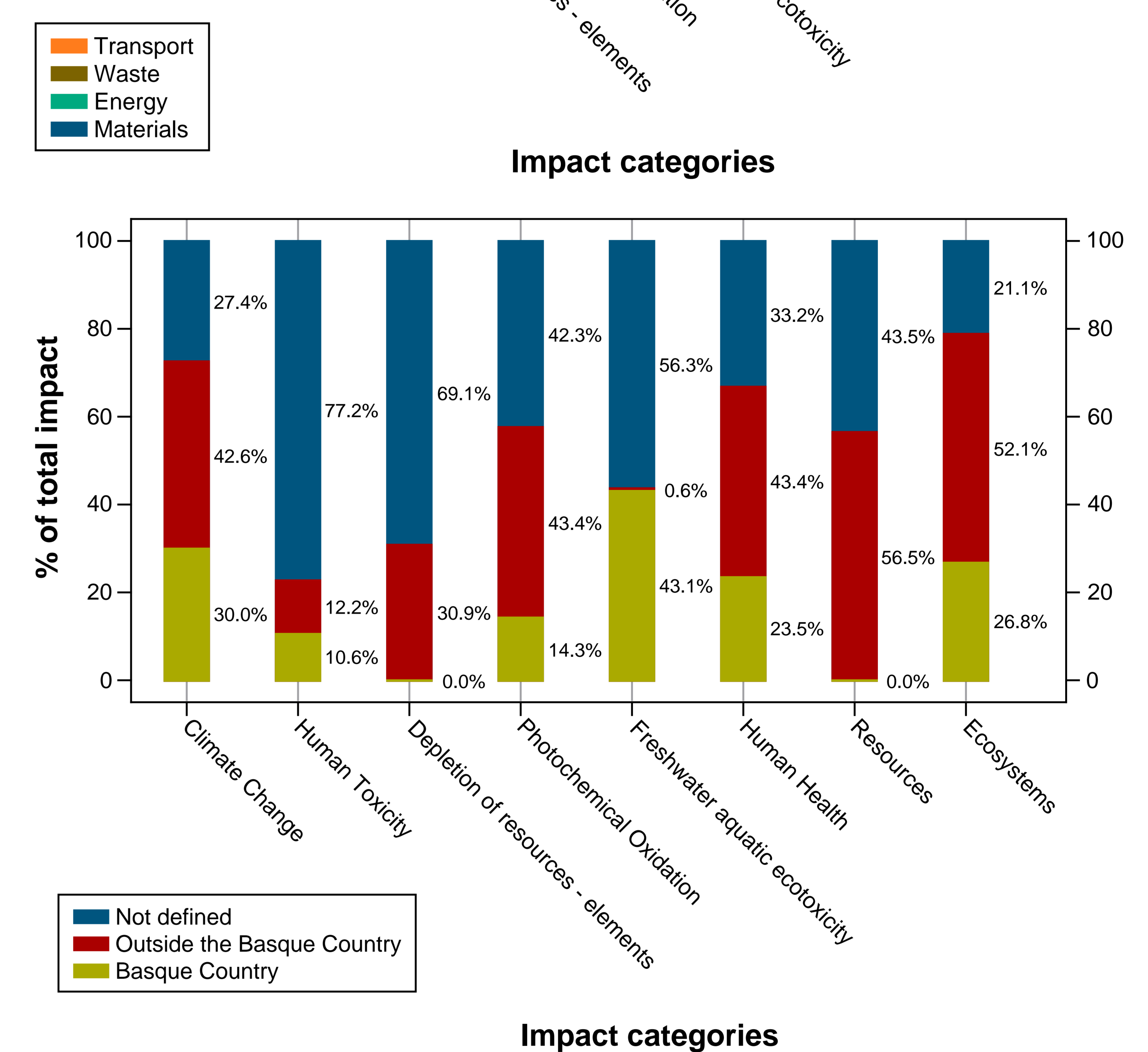
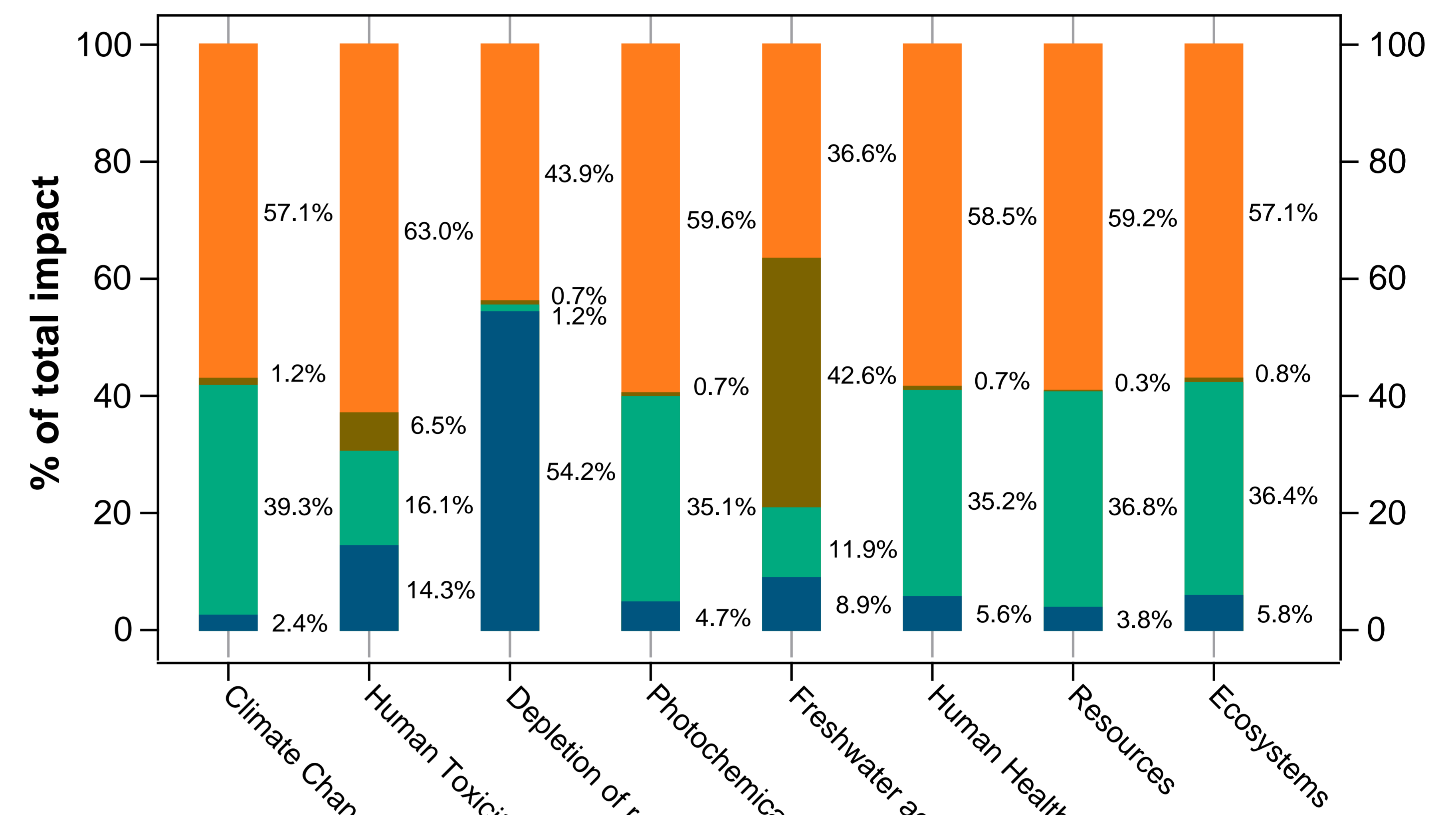
Concept	Unit	Leioa	EIB-Bilbao	Sarriko	Elkano	Donostia-San Sebastián	Eibar	Vitoria-Gasteiz
Users	person	15,024	5,865	3,441	1,086	11,879	344	8,396
Energy resources								
Electricity	MWh	15,989	4,204	1,019	168	7,400	100 ^G	5,074
Natural gas	MWh	14,192	1,985	2,194	178	8,834	0	7,727
Gas-oil	L	0	113,694 ^B	0	0	90 ^B	39,000 ^B	0
Material resources								
Water supply	m ³	116,963	23,718	9,925	1,085	27,979	350 ^G	19,045
Paper	kg	55,022 ^B	29,702 ^B	8,738 ^B	1,263 ^B	18,939 ^B	323 ^B	13,183 ^P
Computers	Units	1,161 ^G	643 ^G	235 ^G	59 ^G	977 ^G	46 ^G	545 ^G
Batteries	kg	421.5 ^B	65.8 ^B	80 ^B	14 ^B	81 ^B	4 ^G	185 ^B
Fluorescent lamps	Units	10,623 ^B	2,400 ^B	260 ^G	38	500 ^P	200 ^G	200 ^G
Toners	Units	1,083 ^G	277 ^G	214 ^G	150 ^G	661 ^G	40 ^G	803 ^G
Waste treatment								
Hazardous waste	kg	23,138 ^B	6,176 ^B	0	0	25,616 ^B	0	9,718 ^B
Light packaging waste	kg	21,622 ^B	3,856 ^S	3,634 ^S	3,744 ^S	5,060 ^S	1,200 ^G	2,996 ^S
Paper waste	kg	134,200 ^B	9,855 ^B	13,909 ^S	4,368 ^B	48,182 ^B	400 ^G	16,754 ^P
Glass waste	kg	2,171 ^B	300 ^S	300 ^S	0	621 ^S	0	1647 ^S
Organic waste	kg	0	0	0	0	20,330 ^S	0	1488 ^S
Residual waste	kg	222,000	60,613 ^S	50,504 ^S	12,480 ^S	19,534 ^P	4,000 ^G	80,126 ^P
WEEE	kg	10,704 ^B	3,500 ^B	1,907 ^B	900 ^B	2,352 ^B	3,000 ^G	2,080 ^B
Toner waste	Units	1,083 ^B	277 ^B	214 ^B	150 ^B	661 ^B	40 ^B	803 ^B
Fluorescent waste	kg	3,400 ^G	768 ^G	83 ^B	12 ^G	160 ^G	64 ^G	64 ^B
Sanitary wastewater	m ³	116,963 ^G	23,718 ^G	9,925 ^G	1,085 ^G	27,979 ^G	35 ^G	19,045 ^G
Transport								
Transport needs	×10 ⁶ p-km	141.16 ^S	42.12 ^S	23.87 ^S	7.28 ^S	101.03 ^S	3.14 ^S	84.87 ^S

LCIA METHODS: CML (Baseline, 2015) and ReCiPe (end-point (H), 2008) environmental impact assessment methods.

3. RESULTS AND DISCUSSION

ENVIRONMENTAL IMPACTS:

- The contribution of transport is close to 60% in most environmental impacts.
- The life cycle of computers stands out among the impacts derived from the consumption of material products.
- More than half of environmental impacts are located outside the Basque Country.



SOCIAL IMPACTS: e.g., the socio-economic context that supports the academic activity of the UPV/EHU shows traces of illiteracy and child labour. 70% of fatal accidents and 23% of non-fatal accidents occur outside of the UPV/EHU.

ALTERNATIVE SCENARIOS: Measures to reduce impacts:

- 1) Shifting to renewable energy sources and renewable electric air conditioning: some impacts may be reduced by more than 30%;
- 2) Lengthening 2 years the useful lifespan of computer equipment: *depletion of abiotic resources-elements* may be reduced by 10%;
- 3) Improving separate collection of residues to increase recycling and composting and to avoid waste incineration;
- 4) 50% of private car transport moving to bus and coach: *human toxicity* may be reduced by almost 20%.

4. CONCLUSIONS AND FUTURE OUTLOOK

- Both the proposed methodology and the set of conclusions could be applied to other academic institutions and organisations.
- Contribution of transport is very significant and close to 60% in most of the environmental impacts considered.
- A very relevant part of these impacts was located outside the Basque Country. Regarding social impacts, the contribution of labour activity at the UPV/EHU stands out.
- This work shows the margin for improvement still existing at the UPV/EHU in order for it to become a more sustainable university. So some measures are outlined differentiated according to the areas studied: 1) transport; 2) energy; 3) materials; and 4) waste.
- The implementation of concrete measures will be addressed in the future by means of a participatory MCDA (multi-criteria decision analysis) methodology.
- All specific measures must be complemented with information and awareness campaigns for managers, staff and students.

Publications (open access):

- 1- The environmental and social footprint of the University of the Basque Country UPV/EHU, 2021, *Journal of Cleaner Production*, 315(30)
- 2- Social organisational LCA for the academic activity of the University of the Basque Country UPV/EHU, 2021, *The International Journal of Life Cycle Assessment*, 26(8)
- 3- Dataset on the environmental and social footprint of the University of the Basque Country UPV/EHU, 2022, *Data in Brief*, 41(26)

