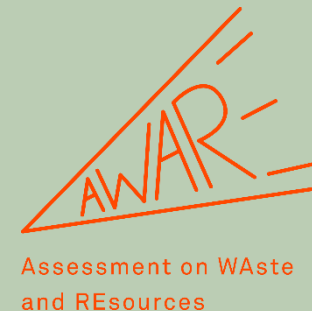
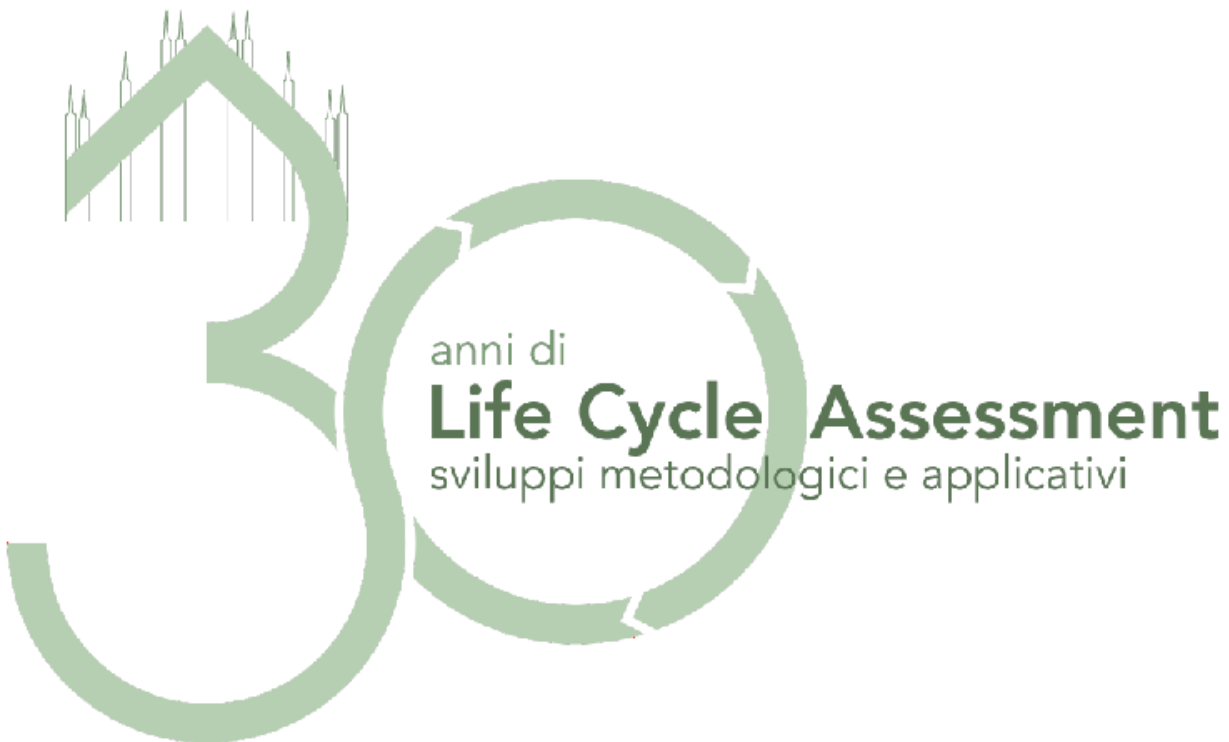


XVII Convegno dell'Associazione Rete Italiana LCA

Milano
28-30 giugno 2023



Valutazione degli impatti ambientali associati alla produzione di biciclette in Europa e in Cina

Giovanni Dolci¹, Stefano Caserini¹, Valeria Venturelli², Mario Grosso¹

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Production of one average bike/e-bike for the sale on the European market

Scenarios

Type	Propulsion	Year	Production
bike	muscle	2020	European
			Chinese
			European with current components mix
		2030	European
			Chinese
			European with expected components mix
e-bike	electric	2020	European
			Chinese
			European with current components mix
		2030	European
			Chinese
			European with expected components mix

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			European with current components mix
		2030	European
			Chinese
			European with expected components mix

Modelling



Modelled
bike: > 83% (in weight)
e-bike: > 87% (in weight)

+ manufacturing

Database for modelling: [ecoinvent v3.8](#)

Bikes components, materials, and weights

	Component	Material	Weight (g)
Frame	Alloy frame + seat tube	aluminium	3788
Fork	Front fork	60% aluminium / 40% steel	2319
Brakes	Front	50% steel / 50% aluminium	165
	Rear	50% steel / 50% aluminium	165
...			

2020

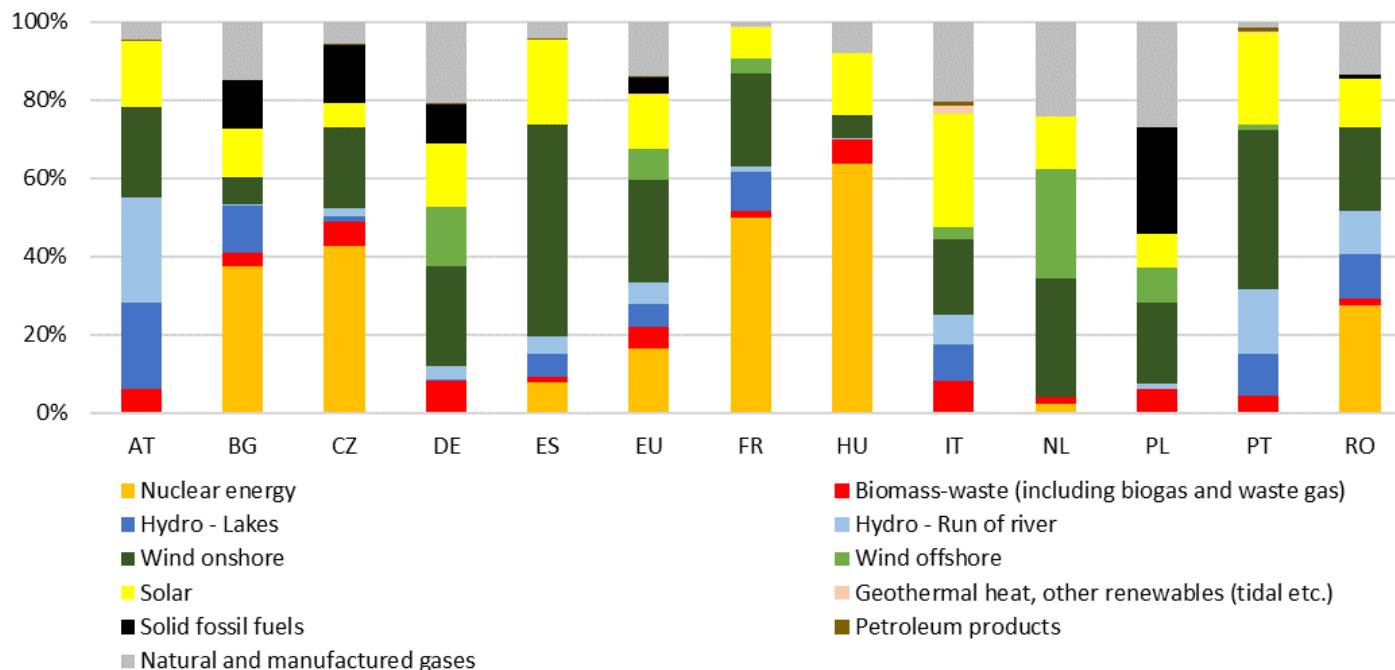
	Component	Material	Weight (g)
Frame	Alloy frame + seat tube	aluminium	3788
Fork	Front fork	aluminium	2000
Brakes	Front	aluminium	165
	Rear	aluminium	165
...			

2030

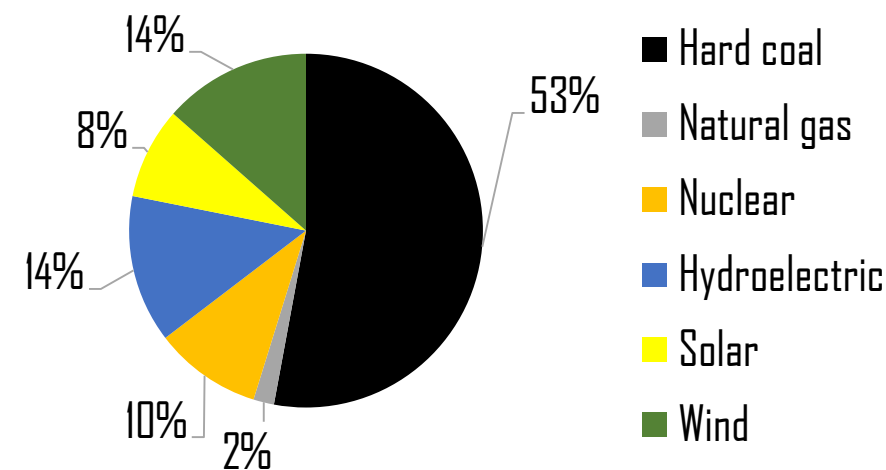
Modelling - electricity

2020 electricity mix - European countries/Chinese provinces

2030 electricity mix - European countries



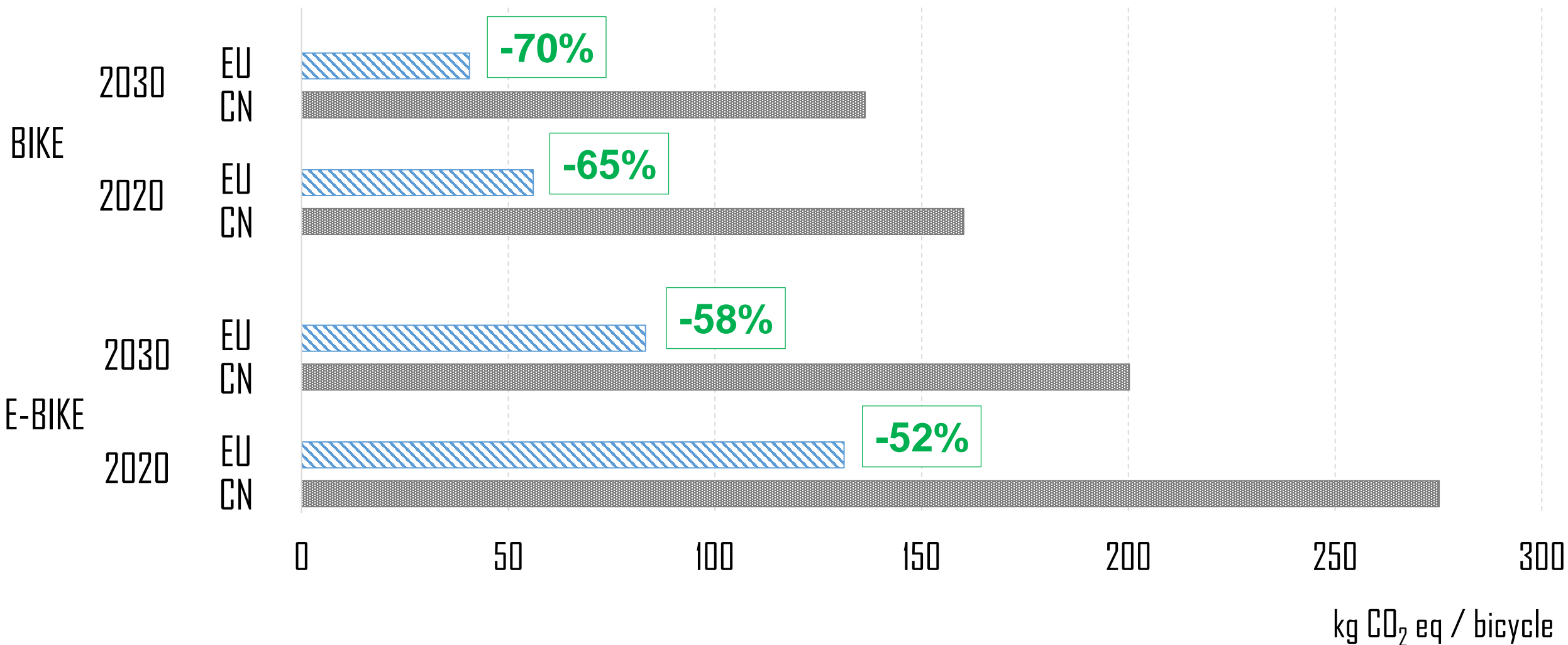
2030 electricity mix - Chinese provinces



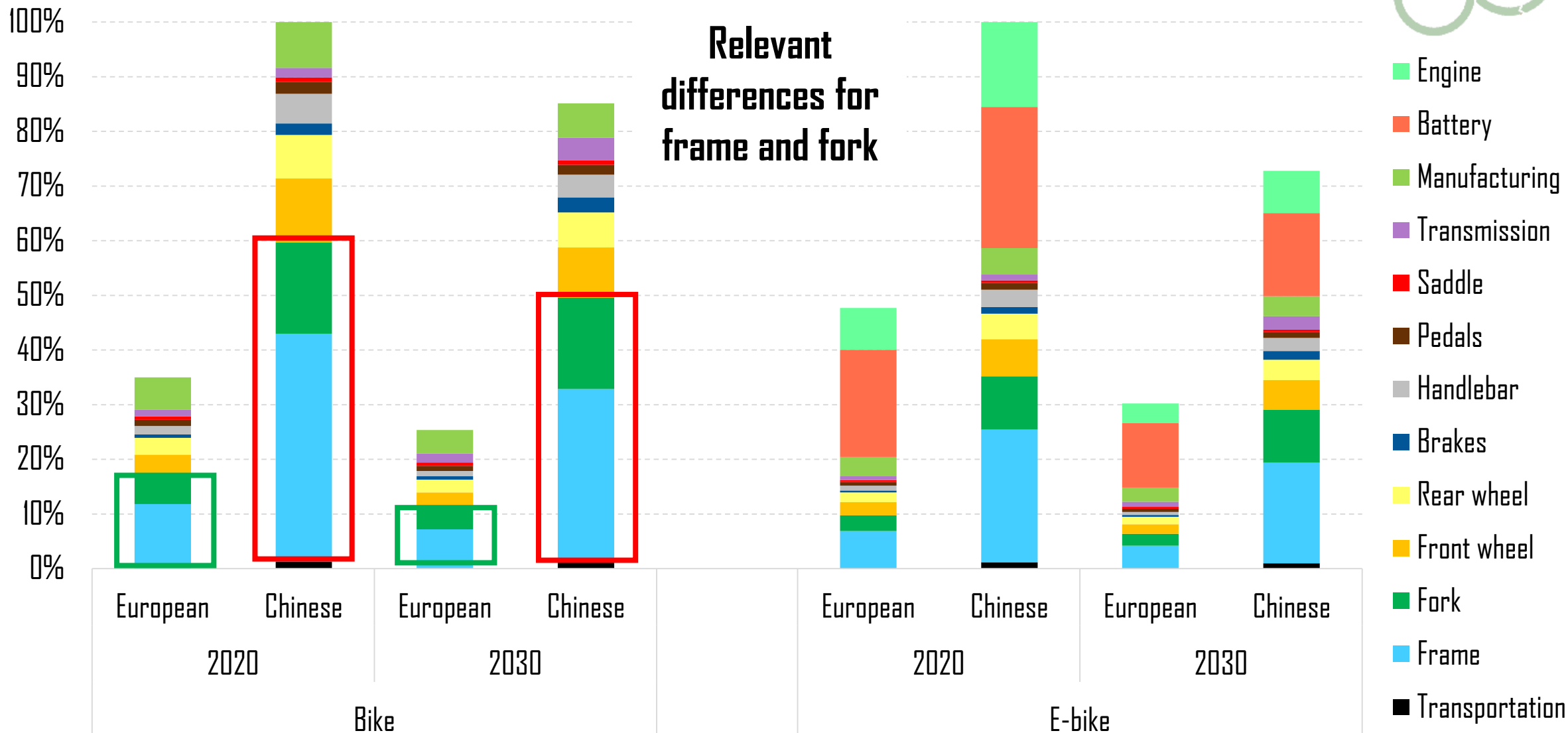
Policy scenarios for delivering the European Green Deal https://energy.ec.europa.eu/data-and-analysis/energy-modelling/policy-scenarios-delivering-european-green-deal_en

He et al., 2020. Rapid cost decrease of renewables and storage accelerates the decarbonization of China's power system. <https://doi.org/10.1038/s41467-020-16184-x>

Results (climate change)

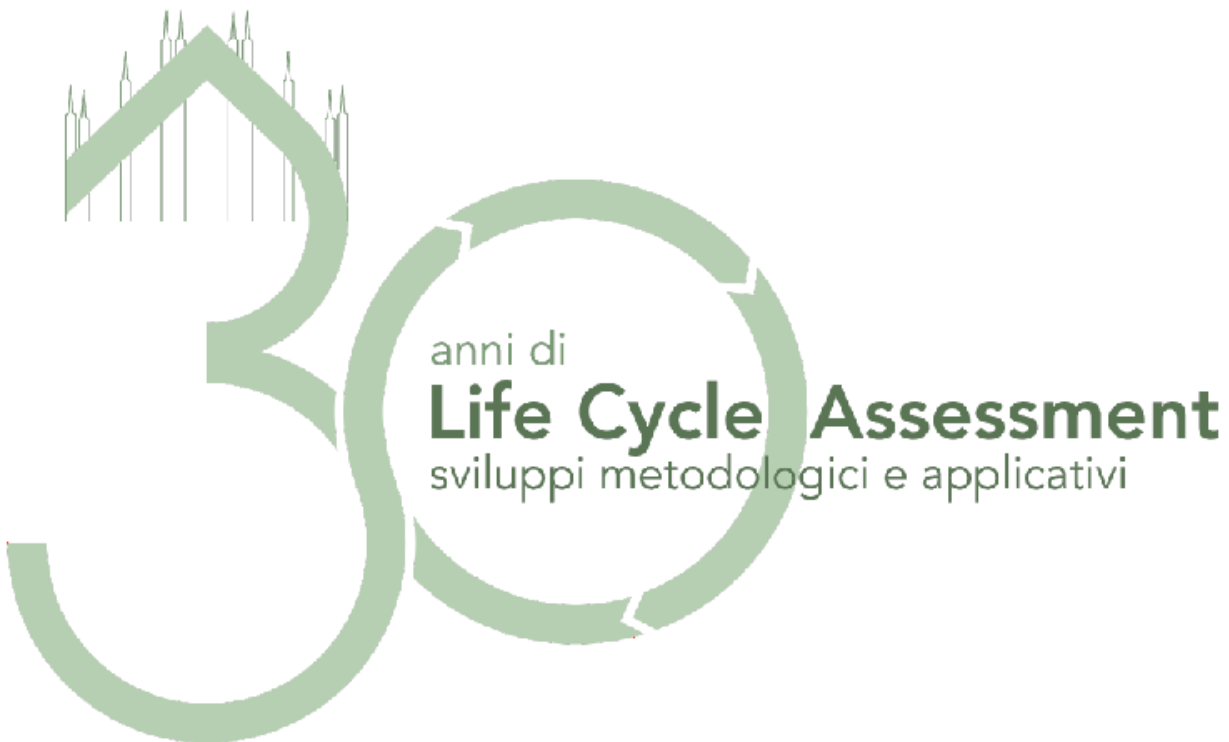


Results (climate change) - contribution analysis



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Grazie per l'attenzione

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Assessment on WASTE
and RESOURCES