

Environmental and Economic Sustainability of Electric Vehicles: LCA and LCC Evaluation of Electricity Sources

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Supplementary information

Table S1. LCIA results for different electricity sources by ReCiPe 2016, ILCD 2011, CML-IA, IMPACT 2002+, and EPD (2013) midpoint methods. Data employed in the elaboration reported in Par. 3.1. – 3.6., Figure 1 (Global warming), Figure 2 (Particulate Matter) and Figure 3 (Acidification).

	Impact categories	Biomas	Coal	Diesel	Hydropower	Lignite	Municipal waste	Natural gas	Peat	Photovoltaic	Wind
ReCiPe 2016	Global warming (kg CO ₂ eq.)	4.355×10 ⁻²	1.039	1.101	5.870×10 ⁻³	1.785	2.103×10 ⁻¹	6.506×10 ⁻¹	1.163	7.281×10 ⁻²	1.013×10 ⁻²
	Stratospheric ozone depletion (kg CFC11 eq.)	1.593×10 ⁻⁷	4.255×10 ⁻⁷	9.429×10 ⁻⁸	1.150×10 ⁻⁹	4.243×10 ⁻⁷	2.463×10 ⁻⁷	1.857×10 ⁻⁷	2.825×10 ⁻⁷	4.703×10 ⁻⁸	1.126×10 ⁻⁸
	Ionizing radiation (kBq Co-60 eq.)	-	5.301×10 ⁻³	-	1.064×10 ⁻⁴	5.054×10 ⁻³	5.959×10 ⁻⁴	-	4.257×10 ⁻³	9.793×10 ⁻³	4.659×10 ⁻⁴
	Ozone formation. Human health (kg NOx eq.)	9.533×10 ⁻³	2.190×10 ⁻³	2.064×10 ⁻³	9.871×10 ⁻⁸	3.041×10 ⁻³	2.953×10 ⁻⁴	5.842×10 ⁻⁴	1.368×10 ⁻³	1.831×10 ⁻⁴	7.746×10 ⁻⁷
	Fine particulate matter formation (kg PM2.5 eq.)	1.993×10 ⁻⁴	1.852×10 ⁻³	7.492×10 ⁻⁴	2.271×10 ⁻⁶	9.789×10 ⁻³	1.161×10 ⁻⁴	1.724×10 ⁻³	1.017×10 ⁻³	1.723×10 ⁻⁴	6.222×10 ⁻⁴
	Ozone formation. Terrestrial ecosystems (kg NOx eq.)	1.496×10 ⁻²	2.195×10 ⁻³	2.139×10 ⁻³	1.555×10 ⁻⁷	3.043×10 ⁻³	3.083×10 ⁻⁴	5.861×10 ⁻⁴	1.370×10 ⁻³	1.920×10 ⁻⁴	1.242×10 ⁻⁶
	Terrestrial acidification (kg SO ₂ eq.)	7.096×10 ⁻⁴	5.430×10 ⁻³	2.541×10 ⁻³	6.321×10 ⁻⁶	3.193×10 ⁻³	2.877×10 ⁻⁴	5.932×10 ⁻³	2.711×10 ⁻³	3.523×10 ⁻⁴	2.203×10 ⁻⁵

	Freshwater eutrophication (kg P eq.)	-	4.032× 10 ⁻⁴	-	1.965×10 ⁻⁹	4.051× 10 ⁻³	3.078×10 ⁻⁵	-	2.487× 10 ⁻⁵	4.813×10 ⁻⁵	2.319×10 ⁻⁹
	Marine eutrophication (kg N eq.)	1.828×10 ⁻⁶	2.606× 10 ⁻⁵	5.347×10 ⁻⁶	3.081×10 ⁻⁸	2.459× 10 ⁻⁴	1.776×10 ⁻⁶	3.128×10 ⁻⁶	8.320× 10 ⁻⁷	5.297×10 ⁻⁶	5.677×10 ⁻⁸
	Terrestrial ecotoxicity (kg 1.4-DCB)	4.373×10 ⁻⁵	3.346× 10 ⁻¹	7.248×10 ⁻¹	5.751×10 ⁻³	6.702× 10 ⁻¹	6.036×10 ⁻¹	6.958×10 ⁻³	4.484× 10 ⁻¹	1.762	9.351×10 ⁻³
	Freshwater ecotoxicity (kg 1.4-DCB)	1.249×10 ⁻⁵	1.265× 10 ⁻²	5.684×10 ⁻³	9.223×10 ⁻⁷	9.800× 10 ⁻²	2.241×10 ⁻²	2.051×10 ⁻³	5.721× 10 ⁻³	7.930×10 ⁻³	3.234E× 10 ⁻³
	Marine ecotoxicity (kg 1.4-DCB)	8.075×10 ⁻²	1.422× 10 ²	3.659×10 ¹	7.855×10 ⁻³	1.054× 10 ³	6.728×10 ¹	8.250	5.176× 10 ¹	5.638×10 ¹	1.590×10 ⁻²
	Human carcinogenic toxicity (kg 1.4-DCB)	2.733×10 ⁻³	1.886	1.043×10 ⁻²	-2.320×10 ⁻⁵	1.353× 10 ¹	2.868×10 ⁻¹	2.459×10 ⁻⁴	1.047	5.830×10 ⁻¹	5.500×10 ⁻⁵
	Human non-carcinogenic toxicity (kg 1.4-DCB)	8.494×10 ⁻²	1.176× 10 ²	3.830×10 ¹	-3.436×10 ⁻³	8.675× 10 ²	5.13×10 ¹	8.432	3.846× 10 ¹	4.536×10 ¹	4.417×10 ⁻³
	Land use (m ² a crop eq.)	-	1.063× 10 ⁻²	-	7.218×10 ⁻⁵	2.226× 10 ⁻³	3.547×10 ⁻²	-	1.554× 10 ⁻³	2.364×10 ⁻²	8.927×10 ⁻⁵
	Mineral resource scarcity (kg Cu eq.)	-	1.956× 10 ⁻⁴	-	1.719×10 ⁻⁴	1.442× 10 ⁻⁴	6.925×10 ⁻⁴	-	1.162× 10 ⁻⁴	8.514×10 ⁻⁴	5.188×10 ⁻³
	Fossil resource scarcity (kg oil eq.)	7.500×10 ⁻⁴	2.299× 10 ⁻¹	3.381×10 ⁻¹	4.902×10 ⁻⁴	3.930× 10 ⁻¹	8.901×10 ⁻²	2.772×10 ⁻¹	2.773× 10 ⁻¹	1.931×10 ⁻²	2.278×10 ⁻³
	Water consumption (m ³)	-	1.803× 10 ⁻³	-	2.610×10 ¹	3.520× 10 ⁻³	1.866×10 ⁻³	-	2.473× 10 ⁻³	2.363×10 ⁻³	2.320×10 ⁻²
<i>ILCD 2011</i>	Climate change (kg CO ₂ eq.)	4.577×10 ⁻²	1.122	1.130	6.015×10 ⁻³	1.801	2.310×10 ⁻¹	7.202×10 ⁻¹	1.174	7.788×10 ⁻²	1.096×10 ⁻²
	Ozone depletion (CFC-11 eq.)	8.714×10 ⁻¹⁴	3.797× 10 ⁻⁹	3.928×10 ⁻¹¹	3.890×10 ⁻¹²	2.924× 10 ⁻⁹	4.781×10 ⁻⁸	3.749×10 ⁻¹³	1.895× 10 ⁻⁹	8.552×10 ⁻⁹	3.770×10 ⁻¹¹
	Human toxicity, non-cancer effects (CTUh)	3.317×10 ⁻¹⁰	1.390× 10 ⁻⁷	1.555×10 ⁻⁷	3.359×10 ⁻¹⁰	9.155× 10 ⁻⁷	6.442×10 ⁻⁸	3.910×10 ⁻⁸	1.486× 10 ⁻⁷	5.730×10 ⁻⁸	4.912×10 ⁻¹⁰

	Human toxicity. cancer effects (CTUh)	1.474×10 ⁻⁹	3.880×10 ⁻⁸	1.479×10 ⁻⁸	8.754×10 ⁻¹⁴	2.785×10 ⁻⁷	5.969×10 ⁻⁹	2.415×10 ⁻¹⁰	2.198×10 ⁻⁸	1.209×10 ⁻⁸	5.959×10 ⁻¹²
	Particulate matter (kg PM2.5 eq.)	2.550×10 ⁻⁵	4.108×10 ⁻⁴	9.798×10 ⁻⁵	6.850×10 ⁻⁷	3.264×10 ⁻³	4.439×10 ⁻⁵	3.537×10 ⁻⁴	2.334×10 ⁻⁴	7.260×10 ⁻⁵	9.292×10 ⁻⁷
	Ionizing radiation HH (kBq U235 eq.)	-	4.122×10 ⁻³	-	8.220×10 ⁻⁵	3.924×10 ⁻³	4.614×10 ⁻⁴	-	3.311×10 ⁻³	7.618×10 ⁻³	3.551×10 ⁻⁴
	Ionizing radiation E (interim) (CTUe)	-	1.569×10 ⁻⁸	-	6.538×10 ⁻¹⁰	1.553×10 ⁻⁸	2.818×10 ⁻⁹	-	1.149×10 ⁻⁸	2.308×10 ⁻⁸	3.807×10 ⁻⁹
	Photochemical ozone formation (kg NMVOC eq.)	4.027×10 ⁻²	2.643×10 ⁻³	2.729×10 ⁻³	9.437×10 ⁻⁶	3.235×10 ⁻³	4.149×10 ⁻⁴	1.142×10 ⁻³	1.565×10 ⁻³	2.745×10 ⁻⁴	2.317×10 ⁻⁵
	Acidification (molc H+ eq.)	9.993×10 ⁻⁴	7.714×10 ⁻³	3.215×10 ⁻³	1.049×10 ⁻⁵	5.002×10 ⁻³	4.576×10 ⁻⁴	7.921×10 ⁻³	3.918×10 ⁻³	5.104×10 ⁻⁴	3.307×10 ⁻⁵
	Terrestrial eutrophication (molc N eq.)	3.367×10 ⁻³	9.745×10 ⁻³	8.365×10 ⁻³	3.561×10 ⁻⁵	1.304×10 ⁻²	1.383×10 ⁻³	2.476×10 ⁻³	5.829×10 ⁻³	8.304×10 ⁻⁴	6.765×10 ⁻⁵
	Freshwater eutrophication (kg P eq.)	-	4.032×10 ⁻⁴	-	2.272×10 ⁻⁹	4.051×10 ⁻³	3.226×10 ⁻⁵	-	2.487×10 ⁻⁵	4.816×10 ⁻⁵	4.691×10 ⁻⁹
	Marine eutrophication (kg N eq.)	2.735×10 ⁻⁴	9.396×10 ⁻⁴	7.746×10 ⁻⁴	3.260×10 ⁻⁶	2.010×10 ⁻³	1.140×10 ⁻⁴	2.366×10 ⁻⁴	5.341×10 ⁻⁴	8.415×10 ⁻⁵	5.820×10 ⁻⁶
	Freshwater ecotoxicity (CTUe)	6.393×10 ⁻³	3.330	2.905	3.064×10 ⁻⁴	2.663×10 ¹	7.143	9.339×10 ⁻¹	2.404	2.431	-
											3.110×10 ⁻⁴
	Land use (kg C deficit)	-	5.486×10 ⁻¹	-	1.955×10 ⁻³	1.079×10 ⁻²	3.923×10 ⁻¹	-	1.366×10 ⁻³	7.717	-
											1.515×10 ⁻²
	Water resource depletion (m ³ water)	-	4.010×10 ⁻⁵	-	4.229	2.316×10 ⁻⁴	6.370×10 ⁻⁵	-	3.449×10 ⁻⁴	7.793×10 ⁻⁴	3.757×10 ⁻³
	Mineral, fossil & ren resource depletion (kg Sb eq.)	3.534×10 ⁻¹⁰	1.304×10 ⁻⁶	1.593×10 ⁻⁷	4.376×10 ⁻⁷	8.038×10 ⁻⁷	-6.407×10 ⁻⁷	1.109×10 ⁻⁷	4.666×10 ⁻⁷	3.924×10 ⁻⁵	1.172×10 ⁻³
<i>CML-IA baseline</i>	Abiotic depletion (kg Sb eq.)	-	7.988×10 ⁻⁸	-	2.572×10 ⁻⁷	6.821×10 ⁻⁸	4.051×10 ⁻⁷	-	5.020×10 ⁻⁸	2.411×10 ⁻⁶	-
											2.302×10 ⁻⁷
	Abiotic depletion (fossil fuels) (MJ)	3.233×10 ⁻²	1.010×10 ¹	1.458×10 ¹	2.657×10 ⁻²	1.566×10 ¹	3.663	1.140×10 ¹	2.998×10 ⁻¹	8.241×10 ⁻¹	1.135×10 ⁻¹
	Global warming (kg CO ₂ eq.)	4.548×10 ⁻²	1.150	1.134	5.953×10 ⁻³	1.803	2.351×10 ⁻¹	7.307×10 ⁻¹	1.176	7.932×10 ⁻²	1.089×10 ⁻²

	Ozone layer depletion (kg CFC-11 eq.)	9.498×10 ⁻¹⁴	3.800×10 ⁻⁹	4.282×10 ⁻¹¹	3.892×10 ⁻¹²	2.928×10 ⁻⁹	4.781×10 ⁻⁸	4.050×10 ⁻¹³	1.898×10 ⁻⁹	8.558×10 ⁻⁹	3.771×10 ⁻¹¹
	Human toxicity (kg 1.4-DB eq.)	2.792×10 ⁻³	2.368×10 ⁻¹	1.018	6.204×10 ⁻⁴	1.277	6.624×10 ⁻²	1.996×10 ⁻¹	2.167×10 ⁻¹	7.955×10 ⁻²	2.973×10 ⁻⁴
	Fresh water aquatic ecotox. (kg 1.4-DB eq.)	7.089×10 ⁻⁴	2.287×10 ⁻¹	3.219×10 ⁻¹	1.475×10 ⁻⁵	2.115	1.559×10 ⁻¹	7.132×10 ⁻²	1.782×10 ⁻¹	7.129×10 ⁻²	6.117×10 ⁻⁶
	Marine aquatic ecotoxicity (kg 1.4-DB eq.)	2.697	1.554×10 ³	1.224×10 ³	2.290×10 ⁻¹	5.372×10 ³	1.078×10 ²	2.710×10 ²	1.047×10 ³	3.101×10 ²	4.909×10 ⁻¹
	Terrestrial ecotoxicity (kg 1.4-DB eq.)	8.153×10 ⁻⁸	1.051×10 ⁻³	5.879×10 ⁻⁴	8.330×10 ⁻⁶	3.503×10 ⁻³	8.087×10 ⁻⁴	4.618×10 ⁻⁵	1.755×10 ⁻³	2.483×10 ⁻⁴	7.241×10 ⁻⁶
	Photochemical oxidation (kg C ₂ H ₄ eq.)	2.310×10 ⁻²	2.547×10 ⁻⁴	2.117×10 ⁻⁴	7.495×10 ⁻⁷	1.189×10 ⁻⁴	2.828×10 ⁻⁵	3.133×10 ⁻⁴	1.190×10 ⁻⁴	2.385×10 ⁻⁵	2.705×10 ⁻⁶
	Acidification (kg SO ₂ eq.)	7.536×10 ⁻⁴	6.639×10 ⁻³	2.592×10 ⁻³	8.075×10 ⁻⁶	4.032×10 ⁻³	3.519×10 ⁻⁴	7.152×10 ⁻³	3.345×10 ⁻³	4.278×10 ⁻⁴	2.738×10 ⁻⁵
	Eutrophication (kg PO ₄ ³⁻ eq.)	1.058×10 ⁻⁴	1.565×10 ⁻³	2.730×10 ⁻⁴	1.157×10 ⁻⁶	1.305×10 ⁻²	1.468×10 ⁻⁴	8.956×10 ⁻⁵	2.631×10 ⁻⁴	1.830×10 ⁻⁴	2.238×10 ⁻⁶
<i>IMPA</i>	Carcinogens (kg C ₂ H ₃ Cl eq.)	7.990×10 ⁻⁷	9.715×10 ⁻⁶	1.383×10 ⁻³	3.971×10 ⁻⁶	8.555×10 ⁻⁴	1.417×10 ⁻³	2.379×10 ⁻⁴	5.360×10 ⁻⁴	1.729×10 ⁻³	9.241×10 ⁻⁵
<i>CT</i>	Non-carcinogens (kg C ₂ H ₃ Cl eq.)	1.641×10 ⁻⁴	2.753×10 ⁻³	7.870×10 ⁻²	1.802×10 ⁻⁵	2.595×10 ⁻³	3.303×10 ⁻³	1.768×10 ⁻²	1.694×10 ⁻³	2.656×10 ⁻³	3.735×10 ⁻⁴
<i>2002+</i>	Respiratory inorganics (kg PM _{2.5} eq.)	1.140×10 ⁻⁴	9.148×10 ⁻⁴	3.528×10 ⁻⁴	1.724×10 ⁻⁶	9.399×10 ⁻³	8.545×10 ⁻⁵	5.200×10 ⁻⁴	5.699×10 ⁻⁴	1.159×10 ⁻⁴	3.105×10 ⁻⁶
	Ionizing radiation (Bq C-14 eq.)	-	4.199×10 ⁻¹	-	8.292×10 ⁻³	4.007×10 ⁻¹	4.633×10 ⁻²	-	3.381×10 ⁻¹	7.779×10 ⁻¹	3.645×10 ⁻²
	Ozone layer depletion (kg CFC-11 eq.)	9.498×10 ⁻¹⁴	3.800×10 ⁻⁹	4.282×10 ⁻¹¹	3.892×10 ⁻¹²	2.928×10 ⁻⁹	4.781×10 ⁻⁸	4.050×10 ⁻¹³	1.898×10 ⁻⁹	8.559×10 ⁻⁹	3.771×10 ⁻¹¹
	Respiratory organics (kg C ₂ H ₄ eq.)	2.402×10 ⁻²	3.826×10 ⁻⁵	4.219×10 ⁻⁴	3.492×10 ⁻⁷	3.132×10 ⁻⁵	7.206×10 ⁻⁵	8.960×10 ⁻⁵	2.087×10 ⁻⁵	4.953×10 ⁻⁵	2.749×10 ⁻⁶
	Aquatic ecotoxicity (kg TEG water)	1.085	2.978×10 ¹	4.885×10 ²	5.860×10 ⁻²	3.301	1.959×10 ¹	1.000×10 ⁻²	1.879	7.850	4.817×10 ⁻²
	Terrestrial ecotoxicity (kg TEG soil)	4.642×10 ⁻⁴	7.696	2.074	3.453×10 ⁻²	1.486	7.030	2.391×10 ⁻²	9.625×10 ⁻¹	2.050	2.722×10 ⁻²
	Terrestrial acid/nutri (kg SO ₂ eq.)	4.550×10 ⁻³	1.705×10 ⁻²	1.210×10 ⁻²	4.887×10 ⁻⁵	1.887×10 ⁻²	1.900×10 ⁻³	8.908×10 ⁻³	9.725×10 ⁻³	1.325×10 ⁻³	1.030×10 ⁻⁴

	Land occupation (m ² org.arable)	-	8.440×10 ⁻³	-	4.152×10 ⁻⁵	2.094×10 ⁻³	1.263×10 ⁻²	-	1.437×10 ⁻³	2.405×10 ⁻²	5.419×10 ⁻⁵
	Aquatic acidification (kg SO ₂ eq.)	8.540×10 ⁻⁴	6.293×10 ⁻³	2.790×10 ⁻³	9.215×10 ⁻⁶	4.509×10 ⁻³	3.952×10 ⁻⁴	6.151×10 ⁻³	3.257×10 ⁻³	4.292×10 ⁻⁴	2.659×10 ⁻⁵
	Aquatic eutrophication (kg PO ₄ P-lim)	3.956×10 ⁻⁸	1.551×10 ⁻⁴	8.930×10 ⁻⁶	1.136×10 ⁻⁸	1.278×10 ⁻³	3.632×10 ⁻⁵	6.561×10 ⁻⁶	6.464×10 ⁻⁶	3.415×10 ⁻⁵	8.843×10 ⁻⁸
	Global warming (kg CO ₂ eq.)	4.443×10 ⁻²	1.064	1.113	5.902×10 ⁻³	1.790	2.163×10 ⁻¹	6.628×10 ⁻¹	1.167	7.453×10 ⁻²	1.032×10 ⁻²
<i>EPD (2013)</i>	Acidification (kg SO ₂ eq.)	5.428×10 ⁻⁴	6.293×10 ⁻³	1.923×10 ⁻³	9.172×10 ⁻⁶	4.509×10 ⁻³	3.952×10 ⁻⁴	6.113×10 ⁻³	3.257×10 ⁻³	4.292×10 ⁻⁴	2.668×10 ⁻⁵
	Eutrophication (kg PO ₄ ³⁻ eq.)	1.058×10 ⁻⁴	1.565×10 ⁻³	2.730×10 ⁻⁴	1.157×10 ⁻⁶	1.305×10 ⁻²	1.468×10 ⁻⁴	8.956×10 ⁻⁵	2.631×10 ⁻⁴	1.830×10 ⁻⁴	2.238×10 ⁻⁶

Table S2. LCIA results for different electricity sources by ReCiPe 2016 endpoint method. Data employed in the elaboration reported in Par. 3.7. and Figure 4.

Impact categories	Biomass	Coal	Diesel	Hydropower	Lignite	Municipal waste	Natural gas	Peat	Photovoltaic	Wind
Global warming, Human health (DALY)	5.444×10 ⁻⁷	1.298×10 ⁻⁵	1.377×10 ⁻⁵	7.337×10 ⁻⁸	2.231×10 ⁻⁵	2.628×10 ⁻⁶	8.133×10 ⁻⁶	1.454×10 ⁻⁵	9.102×10 ⁻⁷	1.267×10 ⁻⁷
Global warming, Terrestrial (species/yr)	1.089×10 ⁻⁹	2.597×10 ⁻⁸	2.754×10 ⁻⁸	1.467×10 ⁻¹⁰	4.462×10 ⁻⁸	5.256×10 ⁻⁹	1.627×10 ⁻⁸	2.908×10 ⁻⁸	1.820×10 ⁻⁹	2.534×10 ⁻¹⁰
Global warming, Freshwater (species/yr)	2.970×10 ⁻¹⁴	7.084×10 ⁻¹³	7.512×10 ⁻¹³	4.003×10 ⁻¹⁵	1.217×10 ⁻¹²	1.434×10 ⁻¹³	4.437×10 ⁻¹³	7.932×10 ⁻¹³	4.966×10 ⁻¹⁴	6.912×10 ⁻¹⁵
Stratospheric ozone depletion (DALY)	2.136×10 ⁻¹⁰	5.706×10 ⁻¹⁰	1.265×10 ⁻¹⁰	1.542×10 ⁻¹²	5.690×10 ⁻¹⁰	3.304×10 ⁻¹⁰	2.490×10 ⁻¹⁰	3.788×10 ⁻¹⁰	6.307×10 ⁻¹¹	1.510×10 ⁻¹¹
Ionizing radiation (DALY)	-	7.429×10 ⁻¹¹	-	1.493×10 ⁻¹²	7.082×10 ⁻¹¹	8.358×10 ⁻¹²	-	5.965×10 ⁻¹¹	1.372×10 ⁻¹⁰	6.536×10 ⁻¹²

Ozone formation, Human health (DALY)	8.678×10^{-9}	1.993×10^{-9}	1.879×10^{-9}	8.991×10^{-14}	2.767×10^{-9}	2.687×10^{-10}	5.316×10^{-10}	1.245×10^{-9}	1.666×10^{-10}	7.057×10^{-13}
Fine particulate matter formation (DALY)	1.253×10^{-7}	1.163×10^{-6}	4.707×10^{-7}	1.427×10^{-9}	6.157×10^{-6}	7.294×10^{-8}	1.082×10^{-6}	6.385×10^{-7}	1.083×10^{-7}	3.907×10^{-9}
Ozone formation, Terrestrial (species/yr)	1.931×10^{-9}	2.832×10^{-10}	2.759×10^{-10}	2.006×10^{-14}	3.926×10^{-10}	3.977×10^{-11}	7.561×10^{-11}	1.767×10^{-10}	2.477×10^{-11}	1.602×10^{-13}
Terrestrial acidification (species/yr)	1.505×10^{-10}	1.151×10^{-9}	5.386×10^{-10}	1.340×10^{-12}	6.769×10^{-10}	6.099×10^{-11}	1.258×10^{-9}	5.747×10^{-10}	7.468×10^{-11}	4.671×10^{-12}
Freshwater eutrophication (species/yr)	-	2.700×10^{-10}	-	1.316×10^{-15}	2.713×10^{-9}	2.061×10^{-11}	-	1.665×10^{-11}	3.223×10^{-11}	1.553×10^{-15}
Marine eutrophication (species/yr)	3.117×10^{-15}	4.428×10^{-14}	9.116×10^{-15}	5.238×10^{-17}	4.178×10^{-13}	3.018×10^{-15}	5.333×10^{-15}	1.414×10^{-15}	9.002×10^{-15}	-9.652×10^{-17}
Terrestrial ecotoxicity (species/yr)	4.981×10^{-16}	3.813×10^{-12}	8.253×10^{-12}	6.548×10^{-14}	7.640×10^{-12}	6.873×10^{-12}	7.930×10^{-14}	5.112×10^{-12}	2.009×10^{-11}	-1.065×10^{-13}
Freshwater ecotoxicity (species/yr)	8.677×10^{-15}	8.758×10^{-12}	3.950×10^{-12}	6.408×10^{-16}	6.789×10^{-11}	1.550×10^{-11}	1.425×10^{-12}	3.967×10^{-12}	5.487×10^{-12}	-2.245×10^{-15}
Marine ecotoxicity (species/yr)	8.468×10^{-12}	1.495×10^{-12}	3.837×10^{-9}	8.242×10^{-13}	1.108×10^{-7}	7.073×10^{-9}	8.652×10^{-10}	5.441×10^{-9}	5.927×10^{-9}	1.663×10^{-12}
Human carcinogenic toxicity (DALY)	9.095×10^{-9}	6.265×10^{-6}	3.462×10^{-8}	-7.714×10^{-11}	4.492×10^{-5}	9.523×10^{-7}	8.159×10^{-10}	3.477×10^{-6}	1.936×10^{-6}	-1.829×10^{-10}
Human non-carcinogenic toxicity (DALY)	1.937×10^{-8}	2.682×10^{-5}	8.733×10^{-6}	-7.756×10^{-10}	1.978×10^{-4}	1.170×10^{-5}	1.923×10^{-6}	8.770×10^{-6}	1.034×10^{-5}	-9.944×10^{-10}

Land use (species/yr)	-	9.436×10^{-11}	-	6.409×10^{-13}	1.976×10^{-11}	3.145×10^{-10}	-	1.379×10^{-11}	2.098×10^{-10}	7.927×10^{-13}
Mineral resource scarcity (USD)	-	4.519×10^{-5}	-	3.972×10^{-5}	3.333×10^{-5}	1.600×10^{-4}	-	2.684×10^{-5}	1.968×10^{-4}	1.196×10^{-3}
Fossil resource scarcity (USD)	3.311×10^{-4}	2.118×10^{-2}	1.492×10^{-1}	1.324×10^{-4}	6.205×10^{-2}	3.169×10^{-2}	9.882×10^{-2}	4.362×10^{-2}	4.564×10^{-3}	7.524×10^{-4}
Water consum., Human (DALY)	-	4.002×10^{-9}	-	5.795×10^{-5}	7.813×10^{-9}	4.142×10^{-9}	-	5.489×10^{-9}	5.246×10^{-9}	5.150×10^{-8}
Water consum., Terrestrial (species/yr)	-	2.434×10^{-11}	-	3.524×10^{-7}	4.751×10^{-11}	2.519×10^{-11}	-	3.338×10^{-11}	3.190×10^{-11}	3.132×10^{-10}
Water consum., Aquatic (species/yr)	-	1.089×10^{-15}	-	1.577×10^{-11}	2.126×10^{-15}	1.127×10^{-15}	-	1.493×10^{-15}	1.427×10^{-15}	1.401×10^{-14}