

Supplementary Materials

Table S1. LCIA Small Vehicles.

	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
Petrol	climate change (GWP20)	kg CO2-Eq	4.01E+04	2.39E-01	2.00E-01	6.97E-02	7.30E-01
	terrestrial acidification (TAP20)	kg SO2-Eq	9.55E+01	5.68E-04	3.45E-01	1.32E-01	5.24E-01
	freshwater eutrophication (FEP)	kg P-Eq	7.43E+00	4.42E-05	7.58E-01	1.41E-01	1.01E-01
	photochemical oxidant formation (POFP)	kg NMVOC-Eq	1.01E+02	6.02E-04	3.12E-01	1.90E-01	4.98E-01
	particulate matter formation (PMFP)	kg PM10-Eq	4.76E+01	2.84E-04	4.47E-01	2.37E-01	3.16E-01
	metal depletion (MDP)	kg Fe-Eq	1.88E+03	1.12E-02	8.91E-01	6.68E-02	4.22E-02
	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
Electric	climate change (GWP20)	kg CO2-Eq	3.15E+04	1.88E-01	3.20E-01	8.30E-02	5.97E-01
	terrestrial acidification (TAP20)	kg SO2-Eq	1.60E+02	9.54E-04	3.93E-01	7.47E-02	5.33E-01
	freshwater eutrophication (FEP)	kg P-Eq	3.95E+01	2.35E-04	3.98E-01	2.61E-02	5.76E-01
	photochemical oxidant formation (POFP)	kg NMVOC-Eq	8.34E+01	4.97E-04	5.03E-01	2.22E-01	6.74E-01
	particulate matter formation (PMFP)	kg PM10-Eq	6.35E+01	3.78E-04	5.13E-01	1.75E-01	3.12E-01
	metal depletion (MDP)	kg Fe-Eq	9.33E+03	5.55E-02	9.53E-01	1.03E-02	3.65E-02
	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
Diesel	climate change (GWP20)	kg CO2-Eq	3.54E+04	2.11E-01	2.45E-01	8.11E-02	6.47E-01
	terrestrial acidification (TAP20)	kg SO2-Eq	1.31E+02	7.78E-04	2.83E-01	9.84E-02	6.19E-01
	freshwater eutrophication (FEP)	kg P-Eq	8.08E+00	4.81E-05	7.46E-01	1.35E-01	1.19E-01
	photochemical oxidant formation (POFP)	kg NMVOC-Eq	1.59E+02	9.48E-04	2.14E-01	1.22E-01	6.64E-01
	particulate matter formation (PMFP)	kg PM10-Eq	6.49E+01	3.86E-04	3.56E-01	1.78E-01	4.66E-01
	metal depletion (MDP)	kg Fe-Eq	2.14E+03	1.28E-02	8.98E-01	6.08E-02	4.10E-02

Table S2. LCIA Medium Vehicles.

	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
Petrol	climate change (GWP20)	kg CO2-Eq	4.89E+04	2.91E-01	2.17E-01	7.10E-02	7.12E-01
	terrestrial acidification (TAP20)	kg SO2-Eq	1.20E+02	7.15E-04	3.74E-01	1.31E-01	4.95E-01
	freshwater eutrophication (FEP)	kg P-Eq	9.60E+00	5.72E-05	7.75E-01	1.32E-01	9.33E-02
	photochemical oxidant formation (POFP)	kg NMVOC-Eq	1.26E+02	7.52E-04	3.31E-01	1.95E-01	4.74E-01
	particulate matter formation (PMFP)	kg PM10-Eq	6.09E+01	3.62E-04	4.66E-01	2.40E-01	2.94E-01
	metal depletion (MDP)	kg Fe-Eq	2.47E+03	1.47E-02	9.00E-01	6.18E-02	3.82E-02
	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
Electric	climate change (GWP20)	kg CO2-Eq	4.07E+04	2.42E-01	3.48E-01	8.46E-02	5.67E-01
	terrestrial acidification (TAP20)	kg SO2-Eq	2.12E+02	1.26E-03	4.33E-01	7.41E-02	4.93E-01
	freshwater eutrophication (FEP)	kg P-Eq	5.22E+01	3.11E-04	4.39E-01	2.60E-02	5.35E-01
	photochemical oxidant formation (POFP)	kg NMVOC-Eq	1.12E+02	6.64E-04	5.30E-01	2.17E-01	2.53E-01
	particulate matter formation (PMFP)	kg PM10-Eq	8.56E+01	5.09E-04	5.43E-01	1.72E-01	2.84E-01
	metal depletion (MDP)	kg Fe-Eq	1.41E+04	8.40E-02	9.61E-01	8.93E-03	2.96E-02
	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
Diesel	climate change (GWP20)	kg CO2-Eq	4.34E+04	2.58E-01	2.65E-01	8.70E-02	6.48E-01
	terrestrial acidification (TAP20)	kg SO2-Eq	1.64E+02	9.76E-04	3.16E-01	1.03E-01	5.81E-01
	freshwater eutrophication (FEP)	kg P-Eq	1.06E+01	6.34E-05	7.59E-01	1.34E-01	1.07E-01
	photochemical oxidant formation (POFP)	kg NMVOC-Eq	1.96E+02	1.16E-03	2.32E-01	1.31E-01	6.37E-01
	particulate matter formation (PMFP)	kg PM10-Eq	8.21E+01	4.89E-04	3.80E-01	1.85E-01	4.34E-01
	metal depletion (MDP)	kg Fe-Eq	3.00E+03	1.79E-02	9.08E-01	5.72E-02	3.45E-02

Table S3. LCIA Large Vehicles.

	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
Petrol	climate change (GWP20)	kg CO2-Eq	5.94E+04	3.54E-01	2.08E-01	7.44E-02	7.18E-01
	terrestrial acidification (TAP20)	kg SO2-Eq	1.48E+02	8.81E-04	3.73E-01	1.35E-01	4.92E-01
	freshwater eutrophication (FEP)	kg P-Eq	1.14E+01	6.78E-05	7.60E-01	1.43E-01	9.63E-02
	photochemical oxidant formation (POFP)	kg NMVOC-Eq	1.53E+02	9.11E-04	3.19E-01	2.02E-01	4.79E-01
	particulate matter formation (PMFP)	kg PM10-Eq	7.35E+01	4.37E-04	4.57E-01	2.44E-01	2.98E-01
	metal depletion (MDP)	kg Fe-Eq	2.93E+03	1.75E-02	8.94E-01	6.70E-02	3.93E-02
	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
Electric	climate change (GWP20)	kg CO2-Eq	5.57E+04	3.31E-01	3.55E-01	7.45E-02	5.70E-01
	terrestrial acidification (TAP20)	kg SO2-Eq	3.05E+02	1.82E-03	4.66E-01	6.24E-02	4.72E-01
	freshwater eutrophication (FEP)	kg P-Eq	7.54E+01	4.49E-04	4.69E-01	2.14E-02	5.10E-01
	photochemical oxidant formation (POFP)	kg NMVOC-Eq	1.52E+02	9.06E-04	5.50E-01	1.95E-01	2.55E-01
	particulate matter formation (PMFP)	kg PM10-Eq	1.21E+02	7.18E-04	5.66E-01	1.57E-01	2.78E-01
	metal depletion (MDP)	kg Fe-Eq	2.39E+04	1.42E-01	9.70E-01	6.32E-03	2.41E-02
	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
Diesel	climate change (GWP20)	kg CO2-Eq	5.37E+04	3.19E-01	2.50E-01	8.46E-02	6.65E-01
	terrestrial acidification (TAP20)	kg SO2-Eq	2.08E+02	1.24E-03	3.19E-01	9.83E-02	5.83E-01
	freshwater eutrophication (FEP)	kg P-Eq	1.27E+01	7.59E-05	7.54E-01	1.33E-01	1.13E-01
	photochemical oxidant formation (POFP)	kg NMVOC-Eq	2.43E+02	1.45E-03	2.21E-01	1.29E-01	6.51E-01
	particulate matter formation (PMFP)	kg PM10-Eq	1.01E+02	6.03E-04	3.72E-01	1.81E-01	4.47E-01
	metal depletion (MDP)	kg Fe-Eq	3.89E+03	2.31E-02	9.14E-01	5.25E-02	3.38E-02

Table S4. LCIA Transport System—Base Case.

Base Case	ICEV	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
		climate change (GWP20)	kg CO2-Eq	1.06E+11	2.72E-01	1.93E-01	8.14E-02	7.26E-01
		terrestrial acidification (TAP20)	kg SO2-Eq	3.00E+08	7.72E-04	3.01E-01	1.29E-01	5.70E-01
		freshwater eutrophication (FEP)	kg P-Eq	1.98E+07	5.11E-05	7.21E-01	1.62E-01	1.17E-01
		photochemical oxidant formation (POFP)	kg NMVOC-Eq	3.36E+08	8.65E-04	2.39E-01	1.76E-01	5.85E-01
		particulate matter formation (PMFP)	kg PM10-Eq	1.47E+08	3.79E-04	3.74E-01	2.36E-01	3.89E-01
		metal depletion (MDP)	kg Fe-Eq	5.20E+09	1.34E-02	8.81E-01	7.43E-02	4.44E-02
	BEV	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
		climate change (GWP20)	kg CO2-Eq	8.43E+10	2.17E-01	3.32E-01	9.46E-02	5.73E-01
		terrestrial acidification (TAP20)	kg SO2-Eq	4.45E+08	1.15E-03	4.25E-01	8.21E-02	4.93E-01
		freshwater eutrophication (FEP)	kg P-Eq	1.09E+08	2.80E-04	4.33E-01	2.88E-02	5.38E-01
		photochemical oxidant formation (POFP)	kg NMVOC-Eq	2.33E+08	6.01E-04	5.04E-01	2.42E-01	2.53E-01
		particulate matter formation (PMFP)	kg PM10-Eq	1.80E+08	4.63E-04	5.22E-01	1.95E-01	2.83E-01
		metal depletion (MDP)	kg Fe-Eq	3.02E+10	7.79E-02	9.61E-01	9.63E-03	2.89E-02

Table S5. LCIA Transport System—Zero Standstill Case.

Zero Standstill Case	ICEV	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
		climate change (GWP20)	kg CO2-Eq	9.96E+10	2.56E-01	1.45E-01	8.63E-02	7.69E-01
		terrestrial acidification (TAP20)	kg SO2-Eq	2.74E+08	7.05E-04	2.34E-01	1.41E-01	6.25E-01
		freshwater eutrophication (FEP)	kg P-Eq	1.57E+07	4.04E-05	6.47E-01	2.05E-01	1.48E-01
		photochemical oxidant formation (POFP)	kg NMVOC-Eq	3.13E+08	8.06E-04	1.82E-01	1.89E-01	6.29E-01
		particulate matter formation (PMFP)	kg PM10-Eq	1.31E+08	3.38E-04	2.98E-01	2.65E-01	4.37E-01
		metal depletion (MDP)	kg Fe-Eq	3.87E+09	9.97E-03	8.41E-01	9.98E-02	5.96E-02
	BEV	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
		climate change (GWP20)	kg CO2-Eq	7.62E+10	1.96E-01	2.61E-01	1.05E-01	6.34E-01
		terrestrial acidification (TAP20)	kg SO2-Eq	3.90E+08	1.00E-03	3.45E-01	9.36E-02	5.62E-01
		freshwater eutrophication (FEP)	kg P-Eq	9.50E+07	2.45E-04	3.52E-01	3.29E-02	6.15E-01
		photochemical oxidant formation (POFP)	kg NMVOC-Eq	1.99E+08	5.13E-04	4.20E-01	2.84E-01	2.97E-01
		particulate matter formation (PMFP)	kg PM10-Eq	1.52E+08	3.93E-04	4.37E-01	2.29E-01	3.34E-01
		metal depletion (MDP)	kg Fe-Eq	2.18E+10	5.62E-02	9.47E-01	1.33E-02	4.01E-02

Table S6. LCIA Transport System—Distribution Case.

Distribution Case	ICEV	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
		climate change (GWP20)	kg CO2-Eq	9.77E+10	2.51E-01	1.88E-01	7.93E-02	7.33E-01
		terrestrial acidification (TAP20)	kg SO2-Eq	2.62E+08	6.76E-04	3.01E-01	1.33E-01	5.66E-01
		freshwater eutrophication (FEP)	kg P-Eq	1.79E+07	4.60E-05	7.22E-01	1.62E-01	1.16E-01
		photochemical oxidant formation (POFP)	kg NMVOC-Eq	2.91E+08	7.50E-04	2.48E-01	1.83E-01	5.69E-01
		particulate matter formation (PMFP)	kg PM10-Eq	1.29E+08	3.33E-04	3.81E-01	2.42E-01	3.76E-01
		metal depletion (MDP)	kg Fe-Eq	4.57E+09	1.18E-02	8.78E-01	7.62E-02	4.57E-02
	BEV	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
		climate change (GWP20)	kg CO2-Eq	7.59E+10	1.95E-01	3.19E-01	9.50E-02	5.86E-01
		terrestrial acidification (TAP20)	kg SO2-Eq	3.93E+08	1.01E-03	4.02E-01	8.40E-02	5.14E-01
		freshwater eutrophication (FEP)	kg P-Eq	9.61E+07	2.47E-04	4.10E-01	2.95E-02	5.61E-01
		photochemical oxidant formation (POFP)	kg NMVOC-Eq	2.06E+08	5.32E-04	4.90E-01	2.47E-01	2.64E-01
		particulate matter formation (PMFP)	kg PM10-Eq	1.58E+08	4.06E-04	5.05E-01	1.97E-01	2.97E-01
		metal depletion (MDP)	kg Fe-Eq	2.46E+10	6.33E-02	9.56E-01	1.07E-02	3.28E-02

Table S7. LCIA Transport System - Renewable Case.

Renewable Case	BEV	Impact category	Unit	Value	Value per km	pct production	pct transport	pct fuel
		climate change (GWP20)	kg CO2-Eq	3.99E+10	1.03E-01	7.03E-01	2.00E-01	9.68E-02
		terrestrial acidification (TAP20)	kg SO2-Eq	2.46E+08	6.33E-04	7.69E-01	1.49E-01	8.22E-02
		freshwater eutrophication (FEP)	kg P-Eq	5.37E+07	1.38E-04	8.78E-01	5.83E-02	6.39E-02
		photochemical oxidant formation (POFP)	kg NMVOC-Eq	1.89E+08	4.86E-04	6.24E-01	3.00E-01	7.66E-02
		particulate matter formation (PMFP)	kg PM10-Eq	1.40E+08	3.60E-04	6.71E-01	2.50E-01	7.95E-02
		metal depletion (MDP)	kg Fe-Eq	3.05E+10	7.87E-02	9.52E-01	9.53E-03	3.84E-02