



Supplementary Materials

Table S1. Inventory data of PLA and Paper/PLA box waste with landfill treatment.

Type	PLA	Paper/PLA	Unit	Stage
Box waste	22.38	28.69	kg	Input
LUC	0.02	0.026	m2	
H2O	5.59	3.47	kg	
CO2	20.52	22.35	kg	Output Emission
CH4	7.46	9.79	kg	

Table S2. Inventory data of PP PLA and Paper/PLA box waste per 1 FU with incineration energy recovery treatment.

Type	PP	PLA	Paper/PLA	Unit	Stage
Box waste	34.66	22.38	28.69	kg	Input
Electricity	2.25	1.45	1.86	kWh	
Fuel oil	0.02	0.01	0.01	Liter	
NaOH	0.17	0.11	0.14	kg	
CaCO3	0.14	0.09	0.11	kg	
NH3	0.07	0.04	0.06	kg	
CO2	107.38	41.1387	46.34	kg	Output
SO2	0.01	0.02	0.11	kg	
NO	0.10	0.14	0.15	kg	
CH4	9.517E-07	3.844E-06	2.197E-06	kg	
N2O	8.827E-08	3.566E-07	2.038E-07	kg	
H2O	47.21	11.26	15.35	kg	
Ash	0.03	0.02	0.02	kg	
Electricity	75.10	18.22	28.31	kWh	
Heavy fuel oil	64.96	15.76	24.48	Liter	

Table S3. Inventory data of PP box waste per 1 FU with mechanical recycling treatment.

Type	PP	Unit	Stage
Box waste	34.64	kg	Input
Electricity	27.20	kWh	
H2O	14.55	kg	
NaOH	0.77	kg	
PP pellet	31.27	kg	Output
Waste water	10.46	kg	
Suspended Solid	0.44	kg	
NH3	0.27	kg	
Phosphorus	0.02	kg	
Oils	0.01	kg	
Solid waste	3.21	kg	

Table S4. Inventory data of PLA and Paper/PLA box waste per 1 FU with composting treatment.

Type	PLA	Paper/PLA	Unit	Stage	
Box waste	22.38	28.69	kg	Input	
Organic waste	134.44	172.35	kg		
Air	118.72	152.19	kg		
CO2	49.25	146.70	kg	Output	
Compost	143.43	183.87	kg		
Fertilizer	N	1.89	2.42		kg
	P	1.18	1.51		kg
	K	1.48	1.89		kg
	Ca	6.89	8.83		kg
	Mg	1.45	1.85	kg	