sustainability

MDPI

Table S1 presents the material and energy flows data related to the urban industrial symbiosis scenario.

Table 1. Summary of process data of the symbiotic network.

	UIS options	Related environmental data
Industrial solid waste utilization	Recycle and reuse steel slag to substitute the raw materials required by cement production (scale is 120,000 ton/year)	Achieve an effect to reduce the raw material consumption of clinker by 120,000 ton per year, meanwhile, to reduce the slag by 120,000 ton per year, and via resource saving, related process CO_2 emissions will be reduced by 66,000 ton per year.
	Recycle and reuse phosphorus slag to other industrial sector, like cement production (500, 000 ton/year)	Achieve an effect to reduce the raw material consumption of clinker by 500,000 ton per year, meanwhile, to reduce the slag by 500,000 ton per year, and via resource saving, related process CO_2 emissions will be reduced by 275, 000 ton per year.
	Recycle and reuse aluminum industry's slag to other industrial sector, like cement production (400, 000 ton/year)	Achieve an effect to reduce the raw material consumption of clinker by 400,000 ton per year, meanwhile, to reduce the slag by 400,000 ton per year, and via resource saving, related process CO_2 emissions will be reduced by 220, 000 ton per year.
	Recycle and reuse the coal gangue to the power plant (100, 000 ton/year)	In this way, it can save the fossil fuel for power generation by 30, 000tce per year. Consequently, will mitigate CO_2 emission by 78, 000 ton per year. Meanwhile, to reduce solid waste by 100, 000 ton per year.
	Recycle and reuse coal flying ash (200, 000 ton/year)	Can help to mitigate solid waste, and will reduce the raw material consume for cement production. Such effects will further bring to mitigate the process CO_2 emission by 200, 000 ton per year.
Urban symbiosis for SW	Waste plastics recycling (10, 000 ton/year)	Per unit ton plastic can substitute 1.2 ton coke consume. In this way, it will help to mitigate CO_2 emission by 31, 000 ton per year.

Waste heat use	Heat exchange (300 ton/year)	Via utilizing waste heat can can reduce fossil fuel consume by around 18,860 tce, and further to mitigate CO_2 emission by 49, 046 ton per year.
Tradition recycling	Waste steel recycling (100, 000 ton/year)	Save material and energy consume for fresh steel making, by 2.5 ton and 12.25GJ per unit ton steel. This will further help to mitigate CO_2 emission by 108, 000 ton per year.

Note: 1 tce = 29.27×10^3 GJ. Kt: 10^3 ton.

1t cement production needs 1.4t ore mining (based on the survey on local cement company).