Table S1. Justification of Key Parameter Settings.

Category	Parameter	Value	Definition	Justification	Source
Government	H	50	Penalty for non-compliance by construction enterprise	Set higher than the net compliance cost (F - f = 15) to ensure deterrence, abstracting the median from actual fine ranges (e.g., 30,000 - 100,000 RMB in Shenzhen and Suzhou).	[1,2]
	E_1	50	Subsidy for proactive construction enterprise	Set to exceed the primary cost barrier (E_1 > F = 45), reflecting pilot programs designed to fully cover initial sorting costs and incentivize participation.	
	E_2	48	Subsidy for proactive recycling enterprise	Set close to high-quality recycling cost (K_1 = 50), reflecting policies that support technology investment and market entry.	
Construction enterprise	F	45	Cost of proactive sorting and waste separation	Higher than passive disposal cost (f = 30), based on industry data on increased labor, time, and equipment expenses for on-site sorting.	[3,4]
	f	30	Cost of passive mixed disposal	Baseline cost for standard landfilling or low-cost disposal methods.	
	I	50	Revenue from selling sorted materials	Higher than revenue from mixed waste (R = 40), reflecting the premium price recyclers pay for less contaminated, pre-sorted materials.	
	R	40	Revenue from selling mixed materials	Baseline revenue for low-value, mixed C&D waste.	
Recycling enterprise	K_1	50	Cost of high-quality recycling	Represents substantial capital for advanced technologies (e.g., purification). Set significantly higher than low-quality methods (o = 25).	[5,6]
	o	25	Cost of low-quality recycling	Baseline cost of basic recycling processes with minimal technology.	
	V	70	Revenue from high-quality recycled products	Reflects market premium for certified recycled aggregates. Set to ensure high-quality recycling is more profitable (V - K_1 > i - o) than low-quality.	
	i	40	Revenue from low-quality	Baseline market price for low-grade recycled materials.	

			recycled products		
	w	30	Penalty for substandard recycling	Designed to ensure that if discovered, low-quality recycling becomes unprofitable (i - o - w < 0), discouraging non-compliance.	
Cross-cutting	p	48	Subsidy reduction coefficient	Controls decay rate of subsidies; calibrated so E_1, $E_2 \rightarrow 0$ when q = 1.	[7,8]
	q	0.5	Resource utilization rate (market maturity index)	Reflects current national average (approx. 40 - 50%) for C&D material reuse in China, as reported in official statistics.	
	n	10	Coordination cost / efficiency loss between enterprise	Represents inefficiencies from poor collaboration or information asymmetry.	
	u	20	Environmental remediation cost for government	Fiscal burden of pollution clean-up from improper waste handling.	
	c	3	Auxiliary fine component	Represents marginal penalties used in secondary enforcement.	

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