



Correction to: How do political steering instruments influence the integration of chemical recycling into plastic recycling networks?

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Correction to: Journal of Industrial Ecology

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In the original version of the publication, an error was committed by the authors in the preprocessing of the input data used to parameterize the German case study. Specifically, during the data import step, the optimization model was inadvertently provided with district identifier values instead of the corresponding district-level waste quantities. As a result, the total waste volumes entering the system were overestimated, and the spatial distribution of available waste across districts was distorted. The mathematical formulation of the optimization model, the scenario setup, and the methodological description in the original article remain unchanged and correct; only the numerical input data used to compute the case study results were affected.

After correcting the data import, all scenarios were recalculated. The correction leads to updated values in the case study for system costs, climate change impact (CCI), recycling rates, and derived network configurations. Due to the lower effective waste quantities and their corrected spatial allocation, transport distances, catchment areas, and plant utilization levels change across scenarios, thereby influencing cost-emission trade-offs and the point at which pyrolysis-based chemical recycling becomes economically favorable.

Table 4 and Figs. 2, 3, and 4 of the original article are affected and have been replaced here with corrected versions provided below. In addition, the updated results for all scenarios are provided in the document *Supporting Information S2_updated*, replacing the previously reported tabular breakdown. Compared to the original publication, absolute values of costs and CCI are lower across scenarios, while the overall structure of the results remains consistent: cost-optimal solutions continue to be dominated by energy recovery, whereas CCI-optimal solutions favor chemical recycling via pyrolysis. Recycling rates are identical in all scenarios except for the CO₂ 45 scenario.

Across scenarios, the updated Fig. 2 preserves the overall pattern reported in the original paper. What changes is where the plateau begins. In the original figure, the system has already reached the high-recycling plateau at CO₂ 45 €/t. In the updated figure, CO₂ 45 €/t is still transitional, with lower recycling and higher CCI, and the plateau is reached only from CO₂ 55 €/t onward. Beyond that point, the updated and published curves are consistent.

The correction thus affects the interpretation of the CO₂ price scenarios. In the original version, a carbon price of 45 €/t CO₂ led to a complete shift from energy recovery to chemical recycling, and the CO₂ price threshold at which this transition occurs was reported as 39.50 €/t CO₂e. In the corrected model runs, the CO₂ price scenario at 45 €/t CO₂ shows that a limited share of waste flows still follows the energetic pathway, while a full transition to chemical recycling occurs at the EU ETS scenario price of 53 €/t CO₂. This shift is driven by the corrected and reduced waste volumes and their altered spatial distribution, which modify optimal catchment areas, transport costs, and the utilization of pyrolysis sites, delaying the point at which some pyrolysis locations become economically viable. Accordingly, the tipping-point CO₂ price, defined here as the level at which the cost-optimal network predominantly routes non-mechanically recyclable residues to pyrolysis, is updated from €39.50/t CO₂e to approximately €46/t

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Fig. 2 Impact of different scenarios on **a** CO₂e emissions (in kt CO₂e), **b** costs (in Mio. €), and recycling rate (in %). All results are displayed in tabular form in Supporting Information S2.2

CO₂e based on the revised scenario results. The updated results still indicate a saturation behavior at higher CO₂ prices: once all non-mechanically recyclable residues

within the model scope are predominantly routed to pyrolysis, further CO₂ price increases lead only to minor changes in network structure.

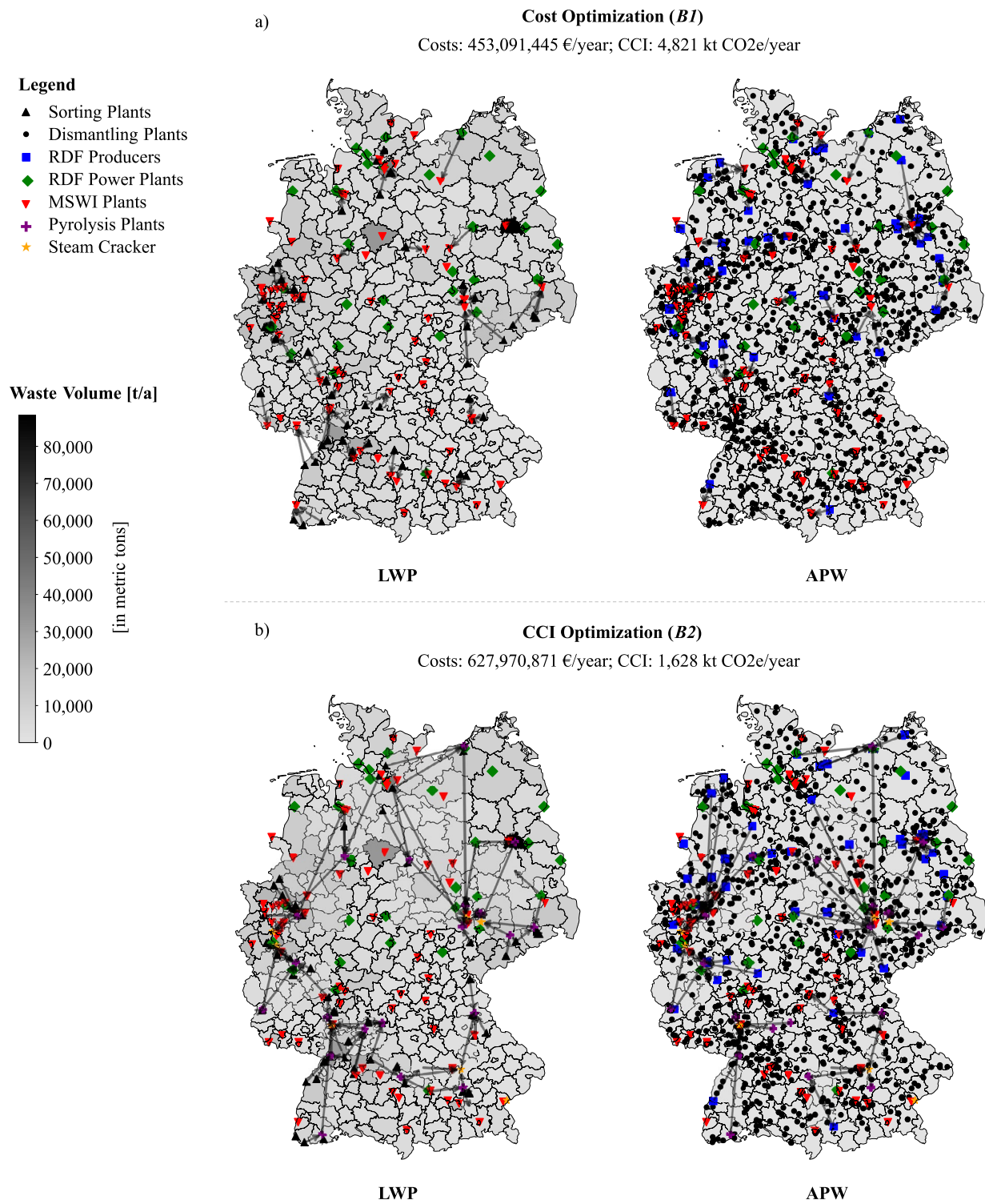


Fig. 3 Material flow in waste treatment networks optimized for **a** costs (scenario B1) and **b** for CCI (scenario B2)

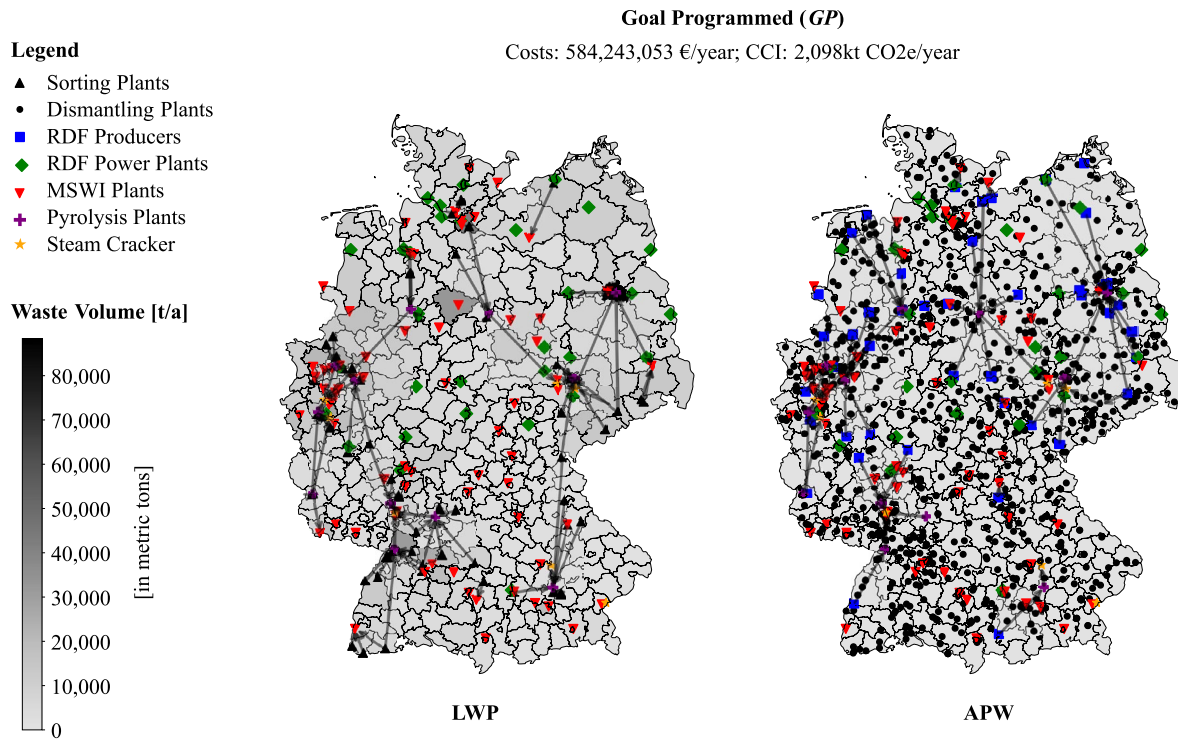


Fig. 4 Material flow in goal programmed waste treatment network optimized for both costs and for CCI (scenario GP)

Table 4 Description of all scenarios assessed, including their key results

Model	Scenario	Description	Recy- cling rate (%)	Costs (in Mio. €)	CCI (in kt CO ₂ e)
Single- objective optimiza- tion model	B1	Model optimized to minimize financial costs	42	453	4821
	B2	Model optimized to minimize climate change impact (CCI)	65	628	1628
Multi- objective optimiza- tion model	GP	Model optimizing both financial costs and climate change impact (CCI) with equal weight assigned to both objectives	62	584	2098
	RR 50	Model with a requirement for at least a 50% recycling rate	50	509	3711
	RR 55	Model with a requirement for at least a 55% recycling rate	55	543	2990
	RR 63	Model with a requirement for at least a 63% recycling rate	63	595	1865
	RR 65	Model with a requirement for at least a 65% recycling rate	65	608	1631
	CO ₂ 25	Model applying Germany's national CO ₂ ETS to the waste sector with a carbon price of €25 per ton of CO ₂	42	545	4821
	CO ₂ 35	Model applying Germany's national CO ₂ ETS to the waste sector with a carbon price of €35 per ton of CO ₂	42	581	4821
	CO ₂ 45	Model applying Germany's national CO ₂ ETS to the waste sector with a carbon price of €45 per ton of CO ₂	60	609	2358
	CO ₂ 55	Model applying Germany's national CO ₂ ETS to the waste sector with a carbon price of €55 per tCO ₂	65	608	1630
	CO ₂ 65	Model applying Germany's national CO ₂ ETS to the waste sector with a carbon price of €65/tCO ₂	65	608	1631
	CO ₂ EU	Model applying the average EU ETS carbon price of 2021 to the waste sector (€53 per ton of CO ₂)	65	609	1636

Despite these updates, the qualitative conclusions of the original article remain valid. Binding recycling-rate requirements of 65% continue to steer the system toward chemical recycling and substantially reduce CCI at increased costs, and carbon pricing remains an effective policy instrument once a sufficiently high CO₂ price level is reached. This correction relates solely to the case-study input data import; it does not change the model scope, assumptions, or the limitations discussed in the original study.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s44498-026-00045-9>.

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