Life Cycle Analysis of Mattress Recycling in California

June 2024 Annex - Updated Results

MRC LCA Report v1.0, Annex June 2024
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Executive Summary

Introduction

This Annex presents updated results to the critically reviewed Life Cycle Assessment (LCA) of mattress recycling in California. The LCA is sponsored by Mattress Recycling Council California, LLC (MRC). The original LCA study, and this update, have been conducted by Scope 3 Consulting, LLC. The study baseline covers mattress recycling activities during 2021. The original critically reviewed LCA report was delivered in 2023. This Annex incorporates updated market information that was not available during the critical review period, as described in §1.1 Study Basis.

For more background on the study, the complete methodology, and the critical review verification, please refer to the full LCA report.

Key Findings

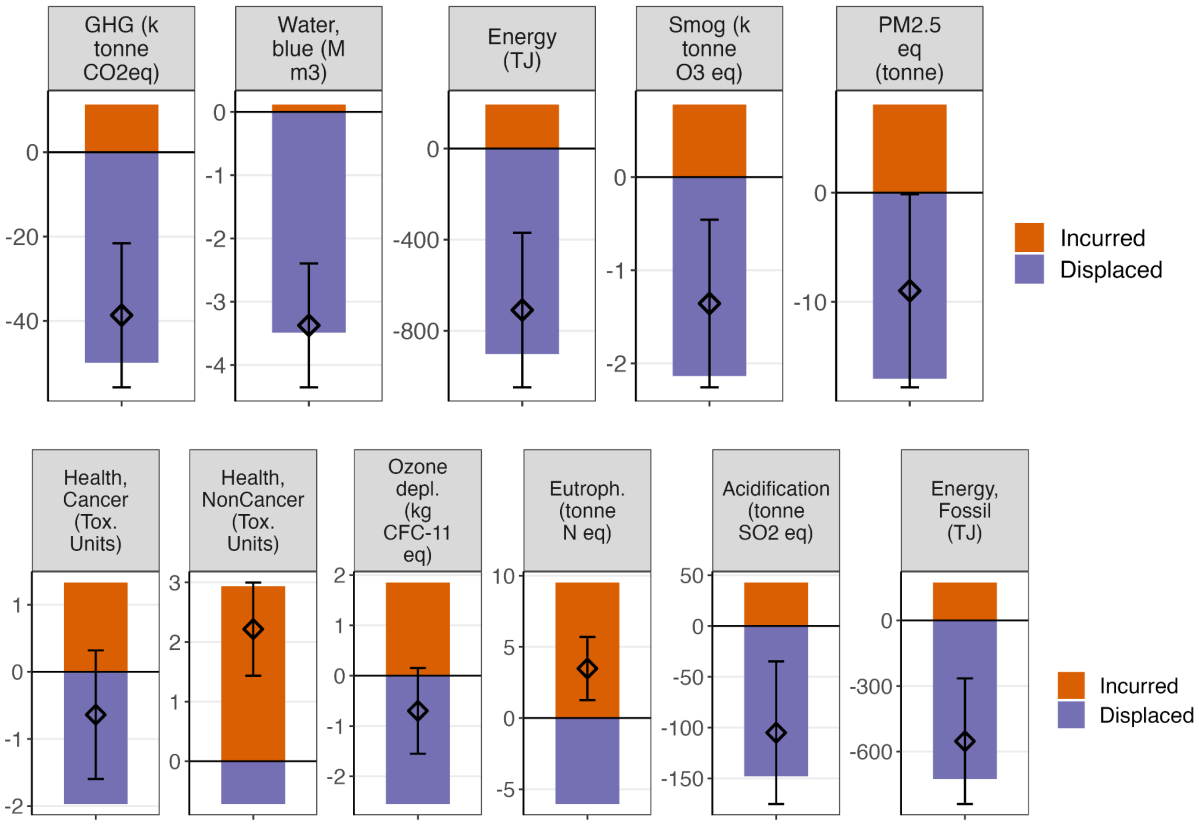
Baseline Performance

In 2021, the California program recycled 1.6 million mattresses. Of the 40.7 thousand metric tons (90 million lbs.) of materials recovered, 31.4 thousand tons (77%) were recycled, and 9.3 thousand tons (23%) were landfilled. The assessment of the 2021 recycling system found that it provides the following net environmental benefits:

- Greenhouse gas reduction: 39,000 metric tons (86 million lbs.) CO_2 equivalents
- Energy demand reduction: 710 terajoules (200 million kWh)
- Blue water demand reduction: 3.4 million m^3 (900 million gallons)
- Particulate matter reduction: 9.0 metric tons PM2.5 equivalent (20 thousand lbs.)
- Smog reduction: 1,360 metric tons O_3 equivalents (1810 thousand lbs.)

According to the LCA model, the mattress recycling system provided environmental benefits in all 5 of the headline study indicators. For supplemental indicators, the overall impact was mixed. Four of the indicators showed net benefits (ozone depletion; acidification; fossil energy; cancer health), while two had consistently worse performance (non-cancer health; eutrophication). The Full ISO-compliant report defines these indicators, explains the modeling methods, and discusses findings in greater detail. Incurred impacts, avoided impacts (displacement), and net results are illustrated in Figure ES.1

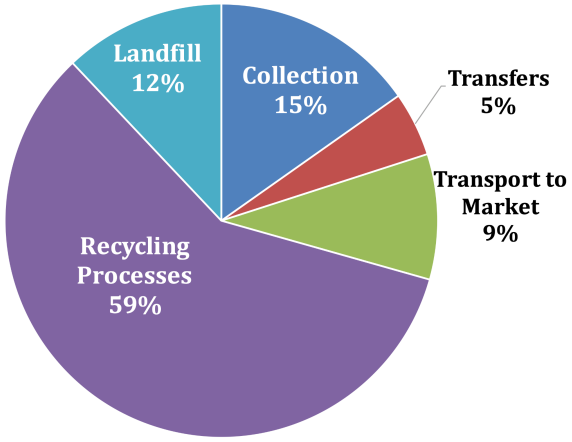
Figure ES.1. Total system impacts for managing 41 thousand tonnes (kt) of used mattresses. Each pane shows the incurred, displaced, and net total impacts of mattress recycling in CA (yr2021). The Diamonds represent the Net total. Top five panes show the headline indicators; bottom panes show the six supplemental indicators. The Error bars show net total results for a range of assumed displacement rates. Tabular data in §Data Tables. See the Full Report, §*Displacement Rates* for explanation, and §*Displaced Production* for ranges.



Incurred Impacts

The *incurred* environmental impacts are from processes related to used mattress collection, transportation, deconstruction, reclamation, transport of extracted mattress materials to final disposition, and remanufacturing. Figure ES.2 illustrates the major drivers for incurred greenhouse gas emissions resulting from the mattress recycling system. Within the Recycling Processes category, the activity of California recyclers and rebond foam pad production are major drivers. The production of methylene diphenyl diisocyanate (MDI) used in rebond foam pad production is also a significant contributor to the Recycling Processes impacts.

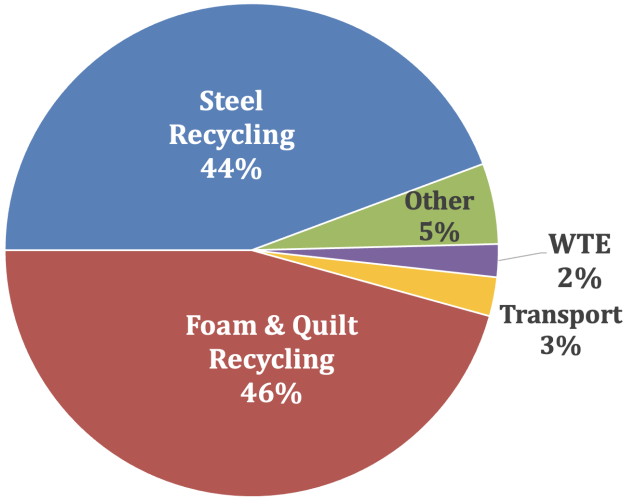
Figure ES.2. Incurred greenhouse gas impacts by process. Estimate of total incurred was 11.3 KT CO_2eq / yr.



Material, Product and Energy Displacement

In addition, the study reports potentially avoided impacts (*displaced*), which would be realized if the supply of recycled materials from mattresses displaces primary (virgin) materials. This relationship between the supply of mattress-derived materials and the displaced production of primary materials is an important uncertainty in this study. For this reason, we model a range of displacement values (depending on the material), and always show incurred impacts (from the mattress recycling system) and potentially avoided impacts (from displaced production), not just a net total. Figure ES.3 illustrates that the major drivers for avoided greenhouse gas impacts were steel recycling and avoided polyurethane foam production.

Figure ES.3. Greenhouse gas displacement drivers by material. Estimate of total displaced climate impact was 50 KT CO_2eq per year.



Net Impacts

For climate impact, water use, smog, energy use, and particulate matter, the magnitude of the potentially displaced impacts is consistently larger than the incurred impacts of the recycling system. Even with the most pessimistic assumption about displacement, the results indicate net benefits from the mattress recycling system.

Alternative Process Assessments

As mentioned previously, global industry research and investments are in progress to develop new pathways for recycling end-of-life materials. This LCA study made a preliminary assessment of several of these technologies.

Initial findings indicate that all established recycling processes, including mechanical recycling, chemical recycling, incineration, and pyrolysis, are more preferable options than landfilling. Chemical recycling has similar environmental impacts, compared with the current mechanical recycling processes and market channels. However, it is important to note that the model relies on publicly available proxy data for the chemical recycling facility. Evaluation of an actual commercial scale chemical recycling facility is necessary to make that firm conclusion.

Improvement Opportunities

The study identified potential short- and long-term opportunities for improving the environmental impacts of mattress recycling.

Transportation of mattresses from collection nodes to recyclers and recovered materials to secondary markets represented approximately 30% of incurred climate impacts. The number, size and location of collection nodes, and primary and secondary recycling facilities, is an important consideration as the mattress recycling industry expands.

Automation to improve recyclers' ability to efficiently separate materials has the potential to increase throughput for recyclers. However, the impact on recovery rates and landfill rates will affect the overall environmental performance.

Development of new end markets for recovered materials remains a key driver for growing and diversifying demand. To maintain and improve current baseline performance, recycling rates for all materials recovered should exceed 75% and must be robust through economic cycles.

Conclusion

The LCA found that the current industry-led product stewardship program offers environmental benefits in all 5 of the headline indicators. Even under the most pessimistic assumptions, the recycling system provides environmental benefits in all 5 of the headline indicators. According to the best estimates of the study, approximately 39,000 metric tons (86 million pounds) of greenhouse gases were avoided when compared with the production of products from virgin raw materials – the same amount as burning 3.8 million gallons of diesel. The program also saved an estimated 900 million gallons of water and mitigated the production of 710 terajoules of primary energy.

This Annex (Q1 2024) is derived from the Full LCA Report that follows ISO 14040 and 14044 guidelines. The full report was critically reviewed by an independent panel of LCA and subject experts, and was found to be in conformance with the ISO standard. This Annex (Q1 2024) presents updates to the Full Report, based on updated information about the fate of recycled quilt, and the status of the scrap foam market.

1 About the study

This document reports the results of a life cycle assessment (LCA) of mattress recycling in the state of California during the year 2021. The results are a continuation of an LCA study commissioned by the Mattress Recycling Council California (MRC) and conducted by Scope 3 Consulting LLC, based in Santa Barbara, CA, USA.

1.1 Study Basis

The study is based on a *material flow analysis* (MFA) of end-of-life mattresses and mattress-derived products collected and managed under the mattress recycling program operated by MRC. The MFA uses primary data provided by MRC to estimate the quantity of EOL mattresses under management, their origins, processing locations, and ultimate fates. The MFA results are coupled to a *life cycle model* that is used to generate estimates of environmental impact. The life cycle model was used to author an ISO 14044-compliant *study report* which underwent critical panel review during 2023. A public version of the critically reviewed report is available from MRC.

The present report updates the study to reflect additional information collected by MRC after the critical review. Two parameters in the study are updated, based on interviews with market participants conducted by MRC:

- The displacement rate (range) for rebond pad has been increased to 50% (with range 20% - 80%), from 30% (10% - 60%). This change was made based on the information that landfill rates for post-industrial scrap foam are very close to zero. If post-industrial scrap foam was landfilled at an appreciable rate, this would indicate some slack in the supply of recycled foam, which would suggest that different sources of scrap foam would compete with each other. However, given the low landfill rates, it is more likely that a change in scrap foam supply could have impacts on other markets (for example, the market for virgin foam). The information about low landfill rates for post-industrial scrap foam does not prove that all rebond foam pad is displacing virgin foam, so the displacement rate assumed is still conservative. Please consult the study report, §1.2.6, for more details on displacement rates.
- All recycled quilt is used as raw material for rebond foam pad manufacturing. Previously, only 25% of recovered quilt was assumed to be used in rebond foam. This update reflects the confirmation from recyclers that all recovered quilt is sold on to rebond pad manufacturers.

The Critical Review Statement (see full LCA report) acknowledges that market dynamics for virgin and recycled foam products will change with time and place. Since the updates reported here are related to use of recycled materials for rebond foam pads, these results remain within the purview of the original critical review. Thus, we refer to this report update as an “Annex”. For further details, including documentation of the study background and methodology, please consult the full study report.

2 Results Updates

2.1 Methodology & MFA Tables

Table 2.1. The annual mass (k tonne) of mattress-derived material (MDM) that is used in each possible recycling route, for the Baseline Scenario, as well as alternative scenarios. A row represents one possible use of a mattress-derived material. 'Primary MDM' indicates the form of a material directly after it is recovered from a mattress. 'Marketed MDM' represents the form of the material that is used in a particular product.

		k tonne / yr			
Primary MDM	**Marketed MDM**	**Baseline**	**Foam to Chemical Recycling**	**Whole units to Pyrolysis**	**Shred and burn**
Steel	Steel to mill	15.13	15.13	15.13	15.17
	Reuse	0.04	0	0	0
Foam	Rebond pad	4.77	0	0	0
	Scrap	0.00	0	0	0
	Reuse	0.40	0	0	0
	Polyol	0.00	5.18	0	0
Quilt	Rebond pad	3.79	3.79	0	0
	Scrap	0.00	0	0	0
	Reuse	0.00	0	0	0
Wood	Mulch	3.51	3.51	0	0
	Reuse	0.20	0.20	0	0
	Energy	1.59	1.59	0	0
Whole mattress	Reuse	0.78	0.78	0	0
	Pyrolysis Oil & Char	0.00	0.00	25.20	0
Cotton	Thread to mill	0.39	0.39	0	0
	Reuse	0.00	0.00	0	0
Shoddy	Plastic to mill	0.22	0.22	0	0

	Scrap	0.00	0.00	0	0
	Reuse	0.00	0.00	0	0
Other fiber & fabric	Thread to mill	0.17	0.17	0	0
	Reuse	0.00	0.00	0	0
Cardboard	Pulp to mill	0.05	0.05	0	0
	Reuse	0.00	0.00	0	0
Plastic	Plastic granulate	0.01	0.01	0	0
Residuals	Landfill	9.26	9.26	0	0
	Energy	0.06	0.06	0	25.20
Total Processed Material		40.38	40.38	40.38	40.38

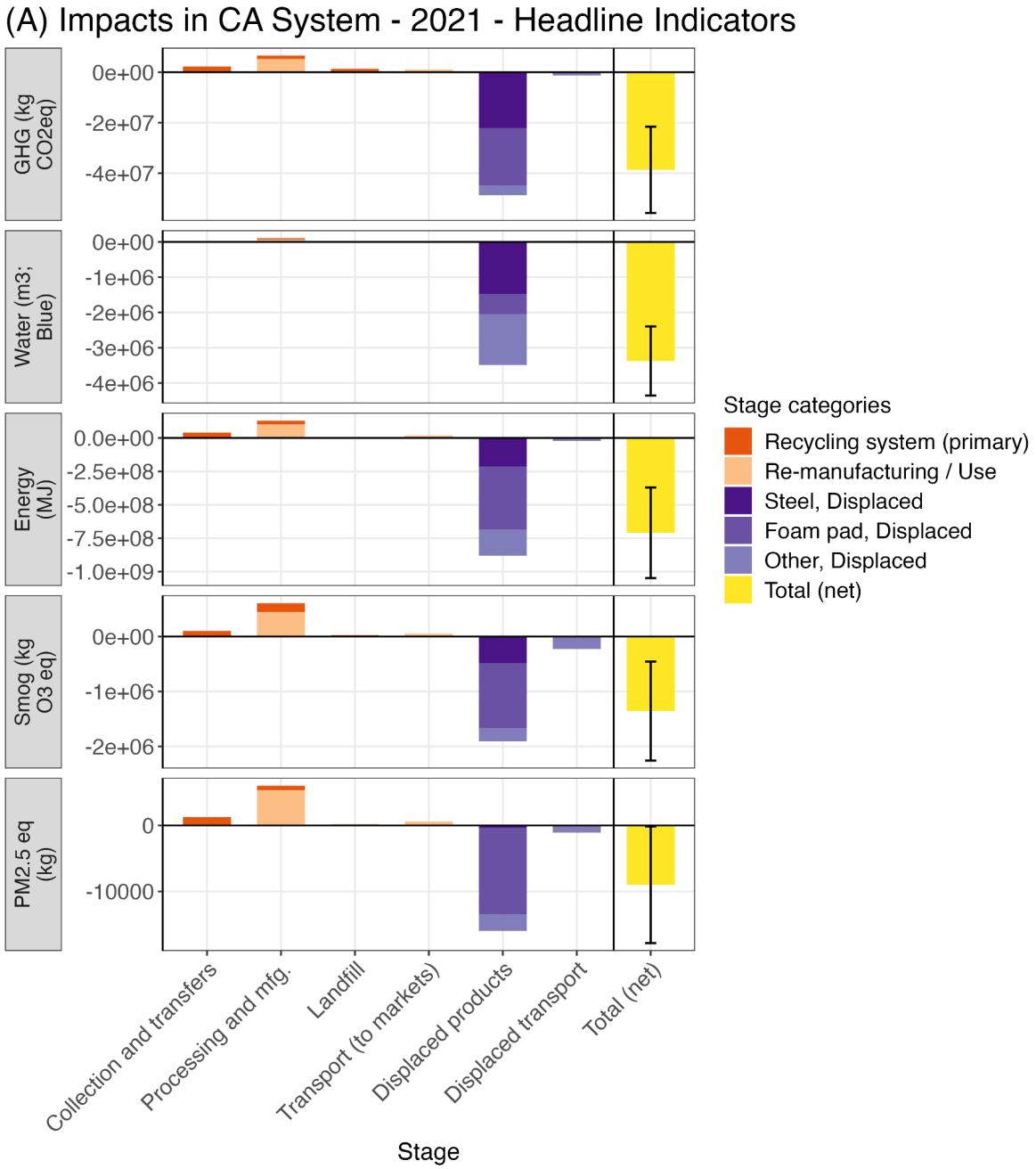
Table 3.17. Displacement rates for each displacement relationship. The column 'Primary MD material?' indicates whether the Mattress-Derived (MD) product is produced directly by CA mattress recyclers ('Yes'), or whether the material requires other processing before being marketed ('No').

Mattress-derived Product	Primary MD material?	Displaced product	Displacement rate (low | rate | hi)
Steel, recycled as scrap	Yes	Steel, displaced	80% | 90% | 100%
Rebond foam pad	No	Foam pad, displaced	20% | 50% | 80%
Foam, recovered	Yes	Post industrial scrap foam, displaced	80% | 90% | 100%
Quilt, recovered	Yes	Post industrial scrap foam, displaced	80% | 90% | 100%
Wood mulch, recovered	No	Wood chips, displaced	80% | 90% | 100%
Cotton, recovered	Yes	Cotton fiber, displaced	50% | 75% | 100%
Shoddy, recovered	Yes	Fibers (mix), displaced	50% | 75% | 100%
Other fiber, recovered	Yes	Fibers (mix), displaced	50% | 75% | 100%
Cardboard, recovered	Yes	Wood pulp, displaced	80% | 90% | 100%
Plastic, recovered	Yes	Plastic, displaced	50% | 75% | 100%
Whole unit, cleaned (reuse)	No	New whole unit, displaced	38% | 56% | 75%
Foam, cleaned (reuse)	No	Foam pad, displaced	50% | 75% | 100%

Wood, cleaned (reuse)	No	Wood, displaced (board)	50% | 75% | 100%
Steel component (reuse)	Yes	Steel spring, displaced	50% | 75% | 100%
Quilt, cleaned (reuse)	No	Quilt, displaced	50% | 75% | 100%
Cotton fabric, cleaned (reuse)	No	Cotton fabric, displaced	50% | 75% | 100%
Other fabric, cleaned (reuse)	No	Polyester fabric, displaced	50% | 75% | 100%
Other, cleaned (reuse)	No	Unknown (reuse)	50% | 75% | 100%
Shoddy, cleaned (reuse)	No	Shoddy pad, displaced	50% | 75% | 100%
Wood fuel	Yes	Heat, natural gas, displaced	60% | 68% | 75%
Electricity from incineration	No	Electricity, Unspecified	80% | 90% | 100%
Heat, from wood chips	No	Heat, natural gas, displaced	60% | 68% | 75%
Polyol, recovered	No	Polyol, displaced	80% | 90% | 100%
Pyrolysis oil	No	Petroleum, displaced	80% | 90% | 100%
Pyrolysis char	No	Carbon black, displaced	80% | 90% | 100%
Synthetic cement	No	Cement (Portland), displaced	75% | 113% | 150%

2.2 Results Figures

Figure 4.1. Impacts of mattress recycling activities, and of the potentially displaced products. These results represent the recycling and management of 1.6 million used mattresses in California during calendar year 2021 Each panel shows results for one type of indicator (Greenhouse gas impact at the top); each panel has a distinct y-axis. Different stages in the system are shown along the horizontal axis. The error bars show the Total (net) impact for the higher and lower displacement rates.



(B) Impacts in CA System - 2021 - Supp. Indicators

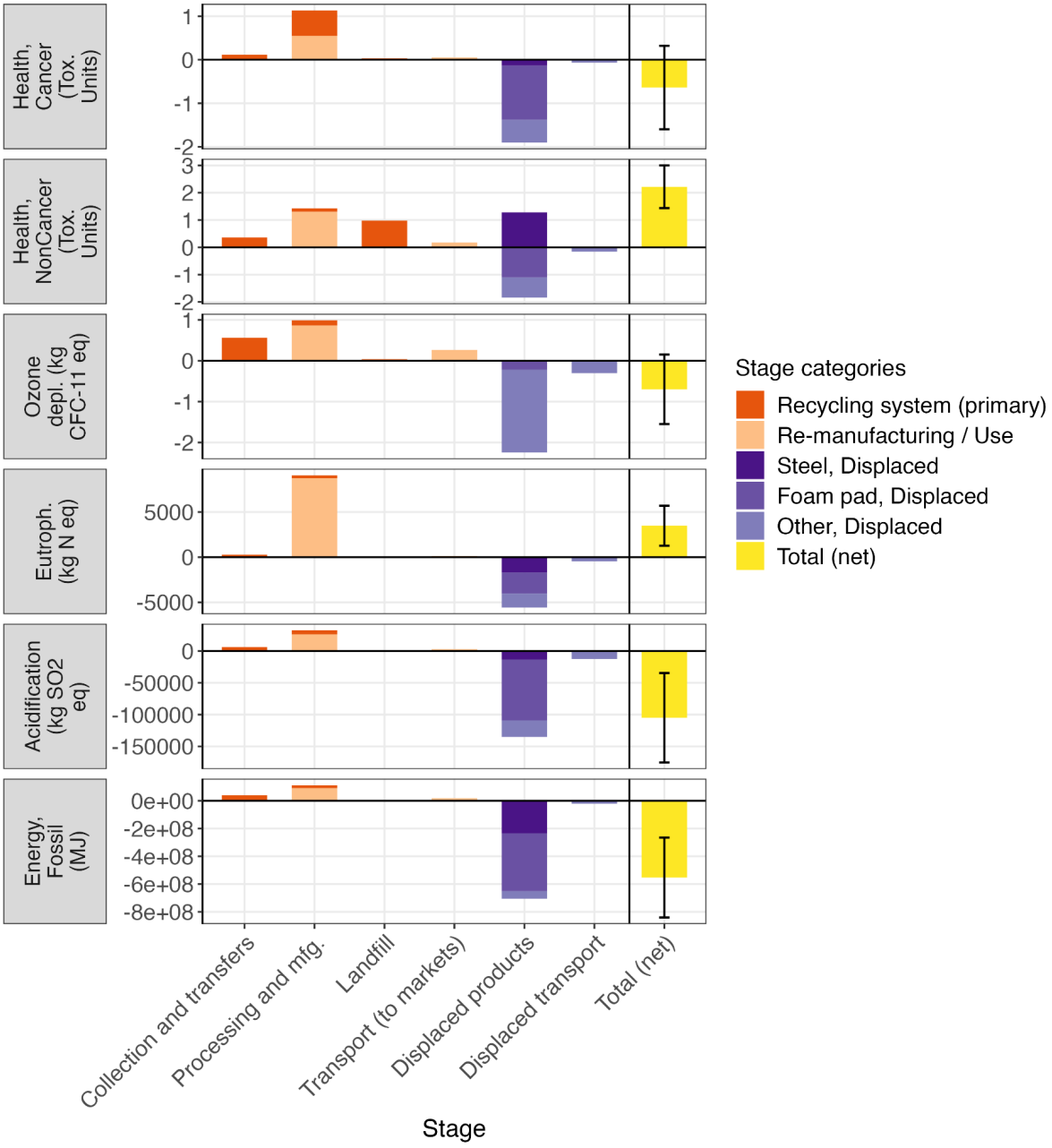
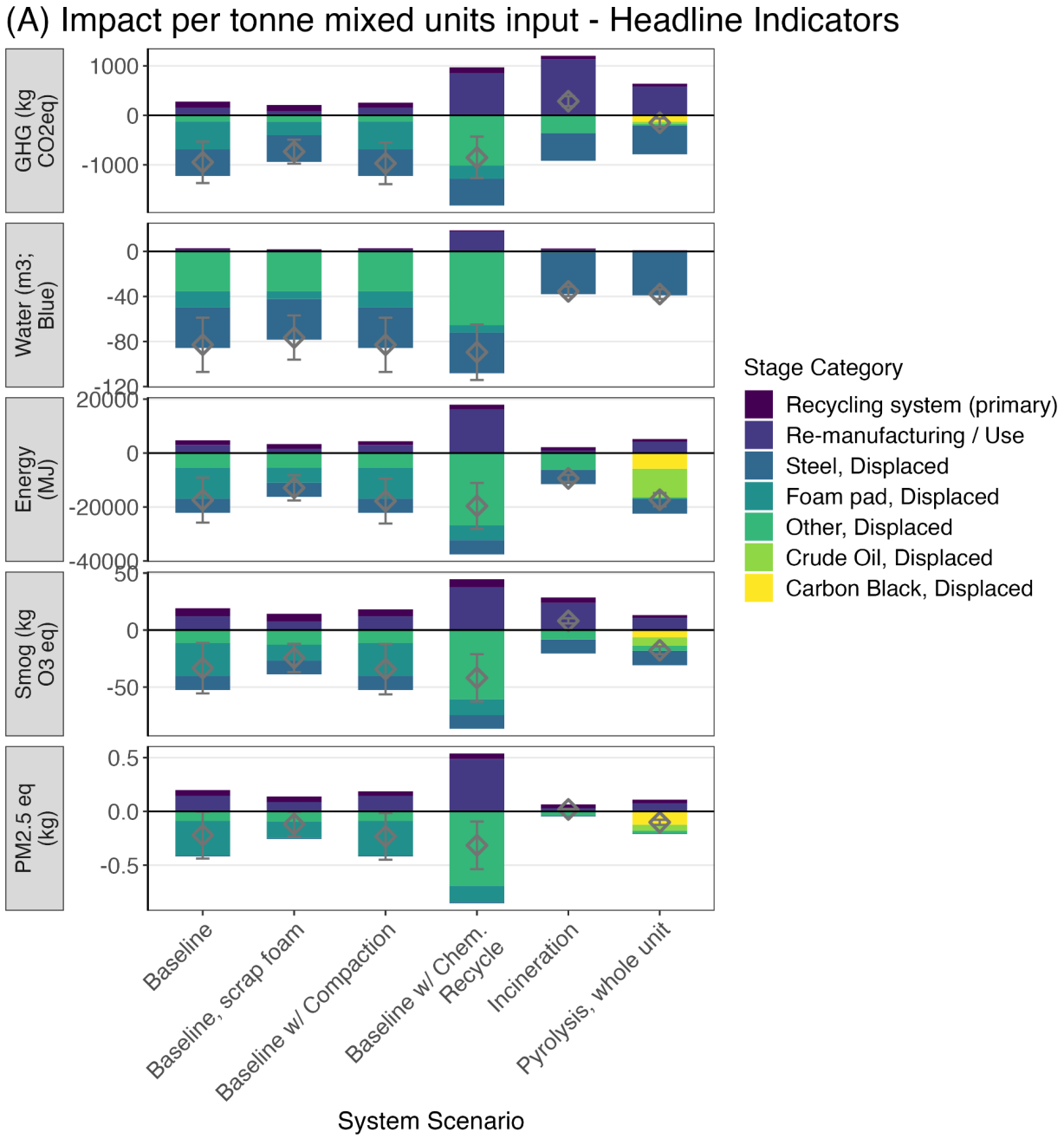


Figure 4.2. Impacts of six used mattress management system scenarios. The scenario on the far left represents the Baseline (representative of the situation in CA 2021).



(B) Impact per tonne mixed units input - Supp. Indicators

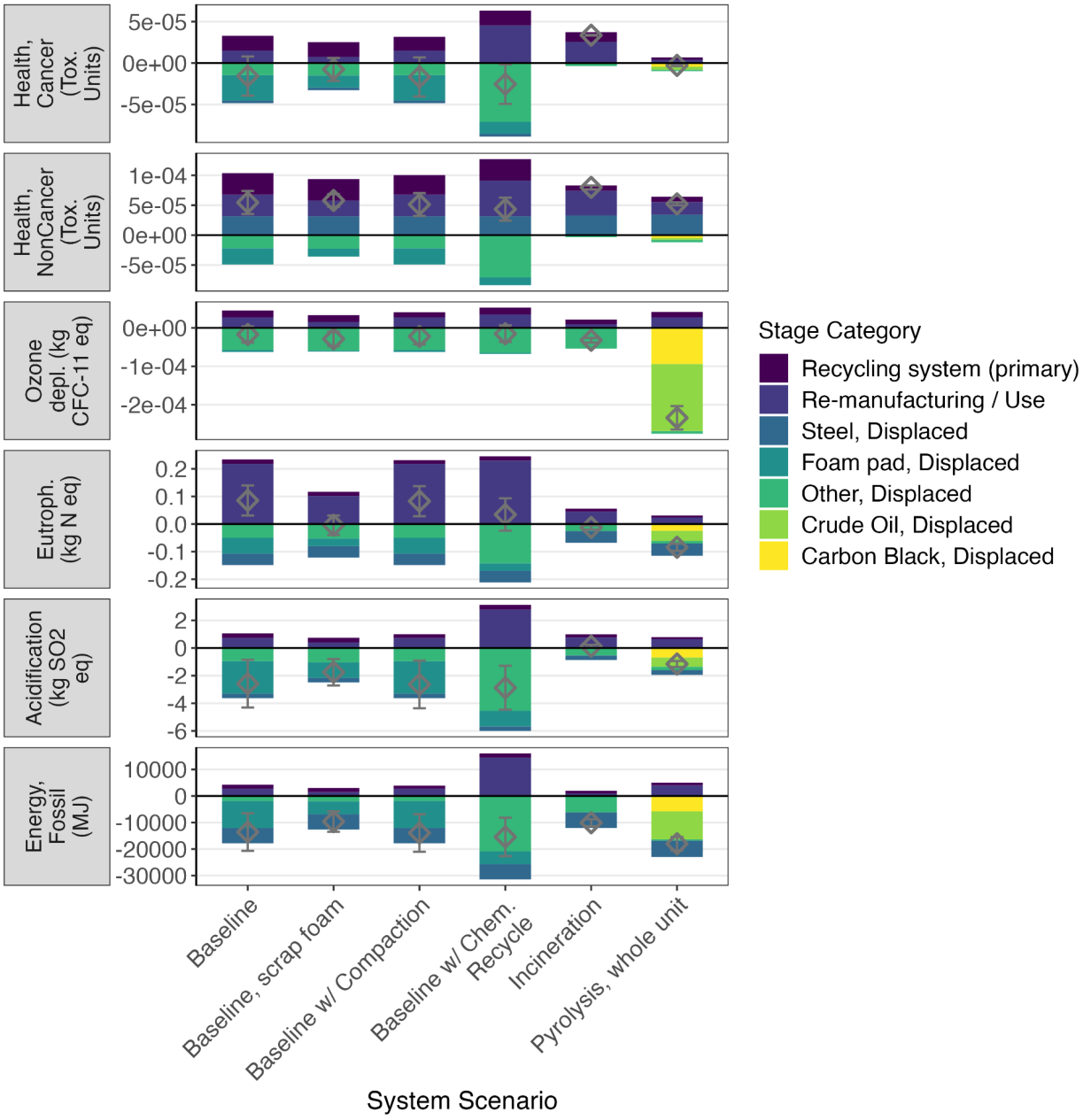
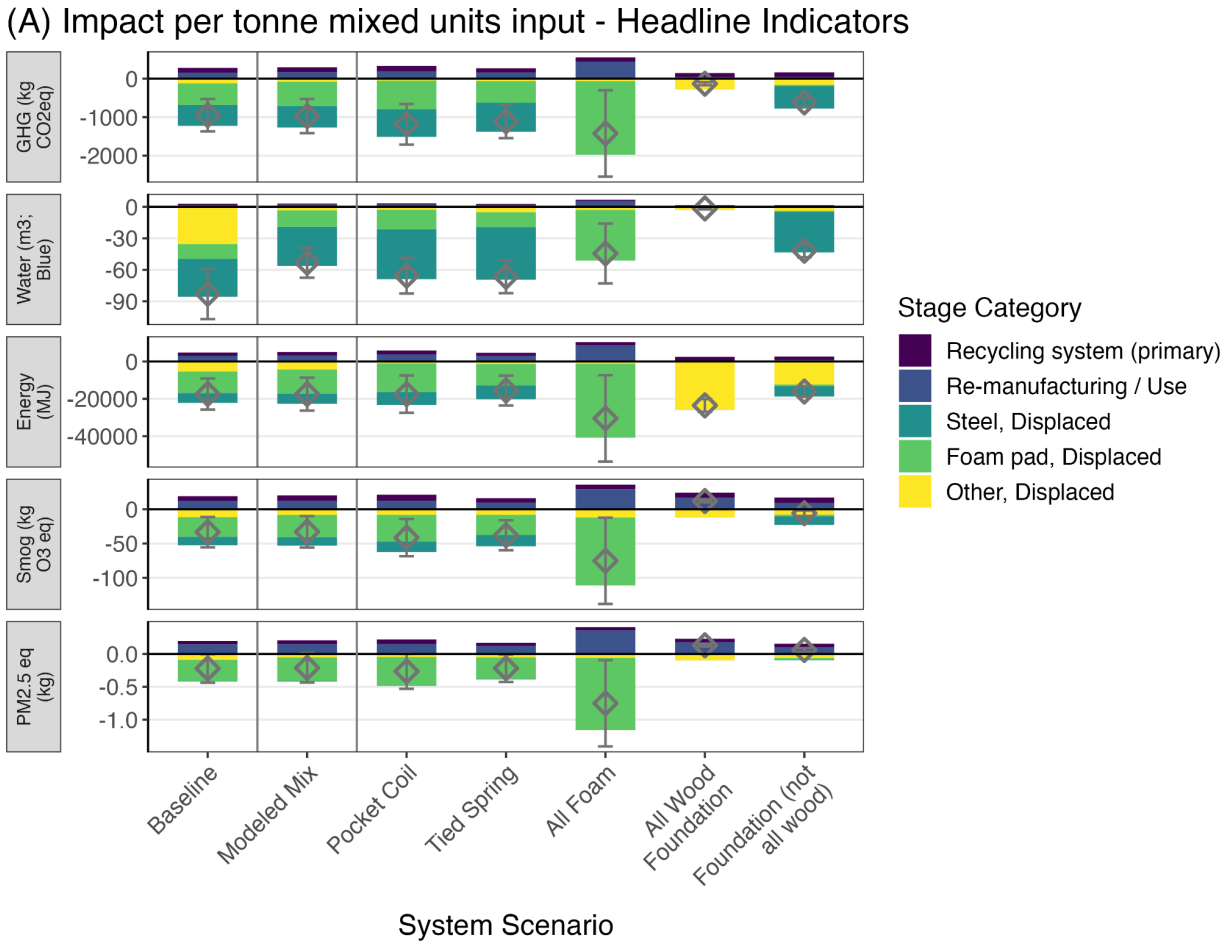


Figure 4.3. Impacts of recycling six different types of used mattress types. The Baseline scenario (far left) is included for comparison. For all other scenarios, the uses (dispositions) of recovered materials are as in the Baseline, but the relative amounts of the materials are determined by the makeup of each type of mattress (see Full Report, §Mattress Unit Characterizations). The “Modeled Mix” scenario is similar to the “Baseline” scenario, but the mix of material outputs is based on the makeup of the mix of mattresses (not on the material outputs reported annually by MRC).



(B) Impact per tonne mixed units input - Supp. Indicators

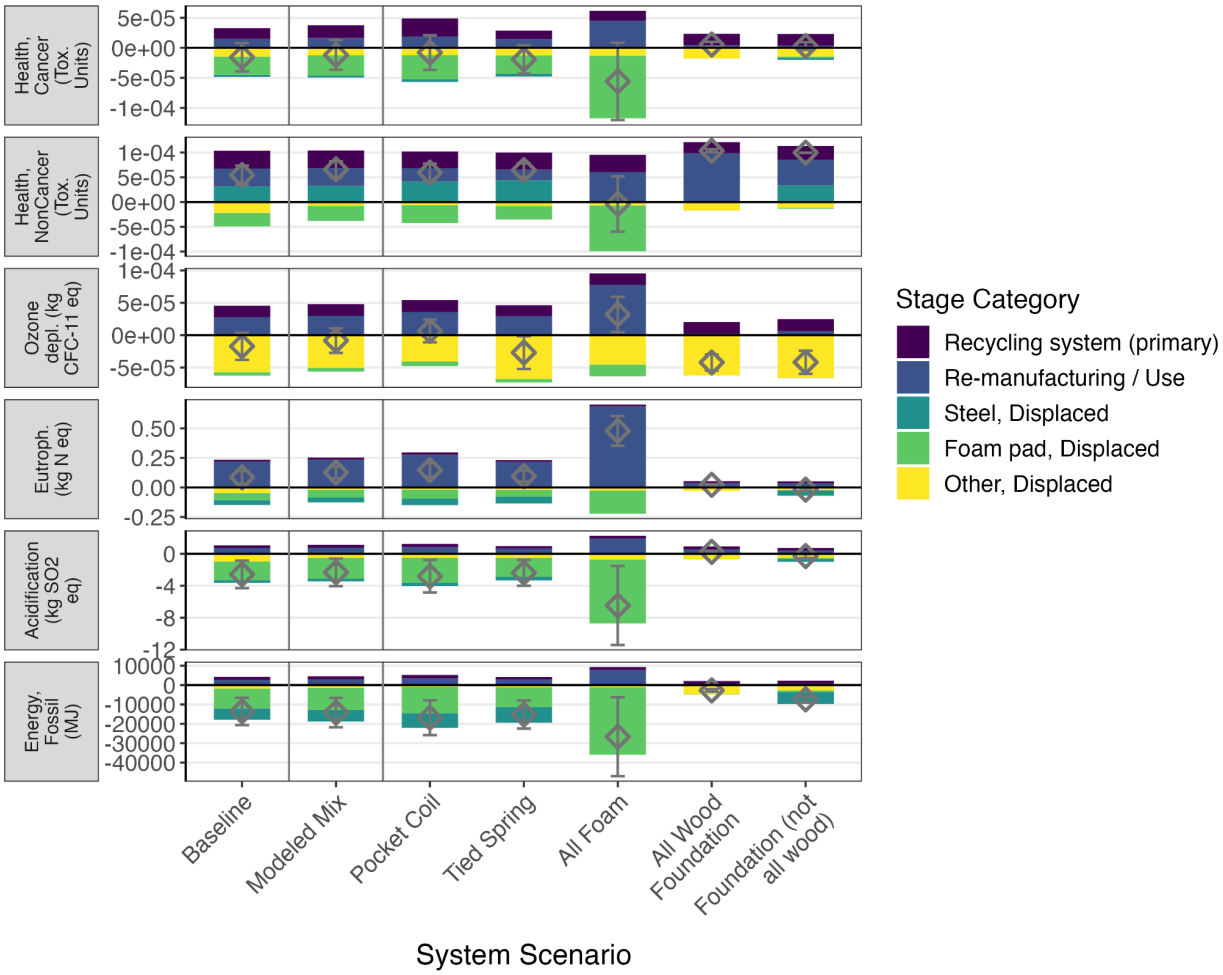
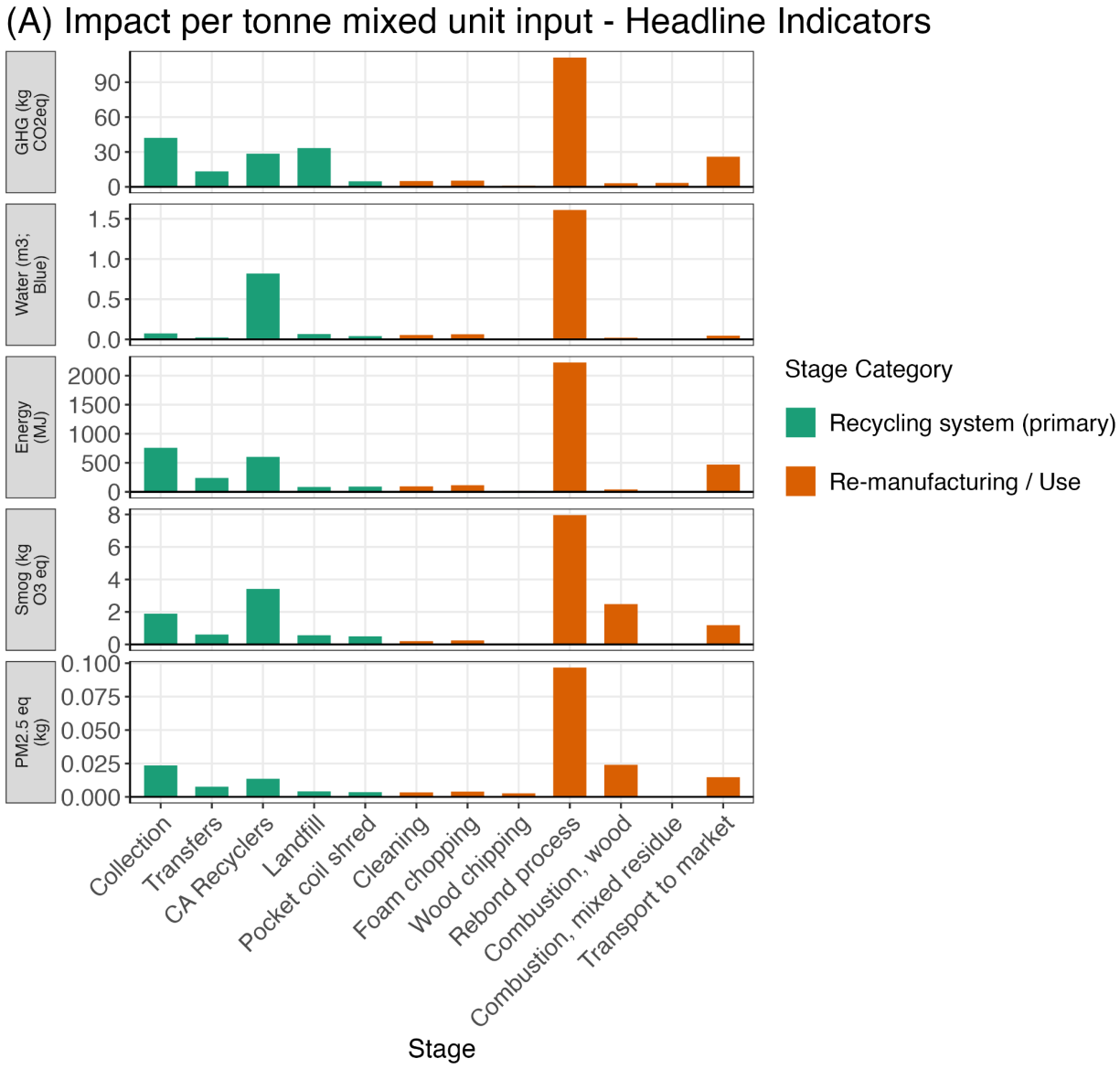


Figure 4.4. Incurred impacts in the recycling system. These results exclude the potentially avoided impacts associated with displaced products.



(B) Impact per tonne mixed unit input - Supp. Indicators

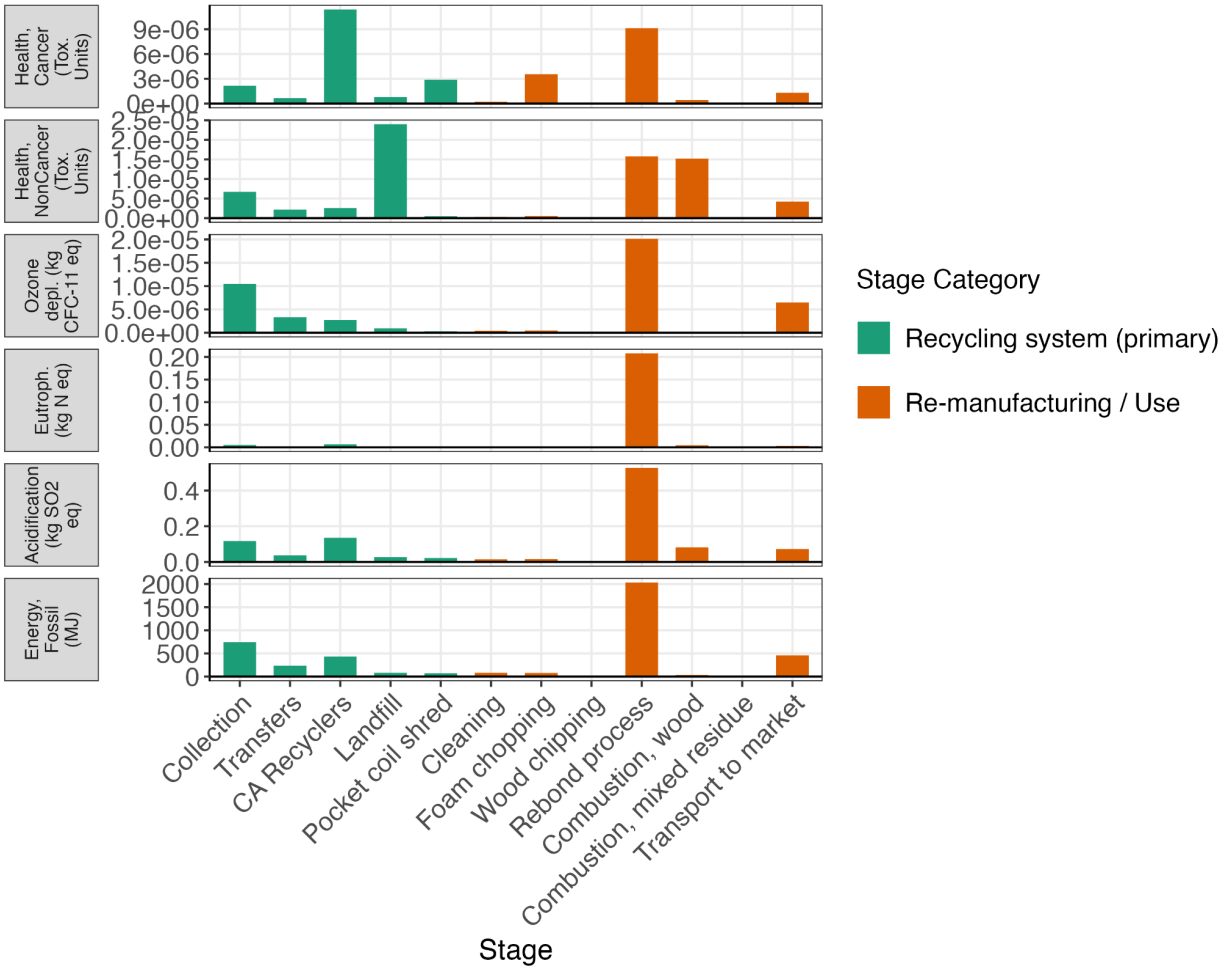
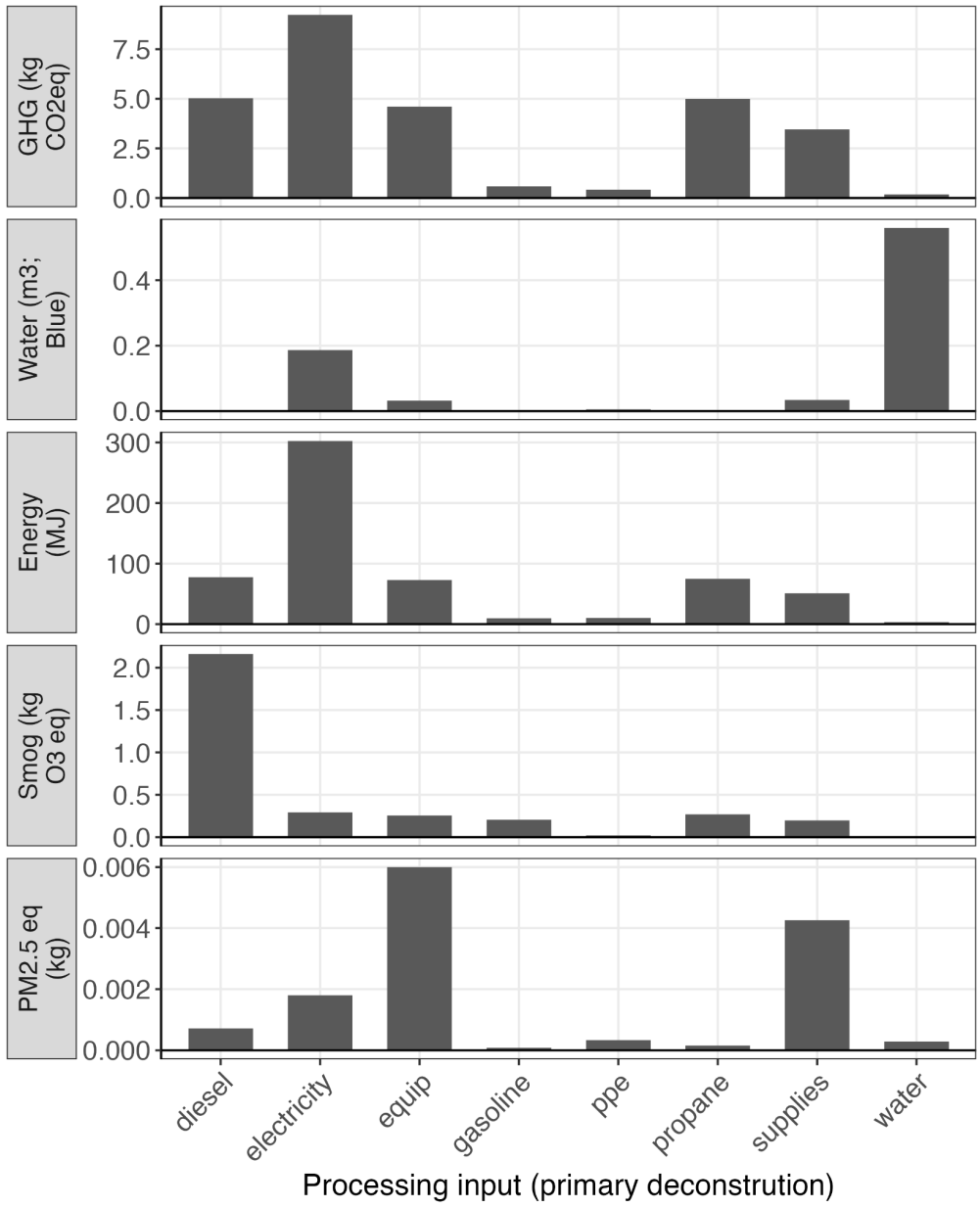


Figure 4.5. Impacts of activities during primary mattress deconstruction. These impacts do not include pocket coil chopping or foam shredding (see previous section). The charts show the impact of processing one tonne of mixed mattress units.



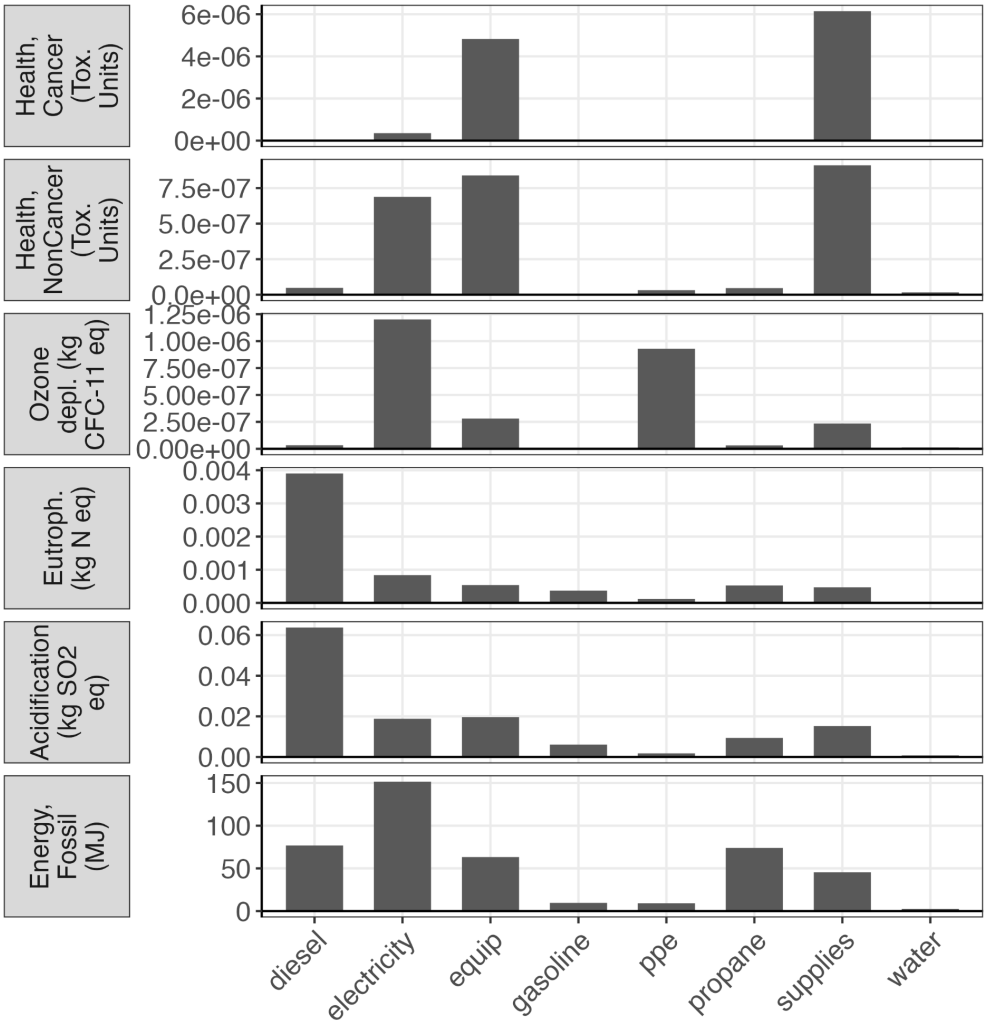
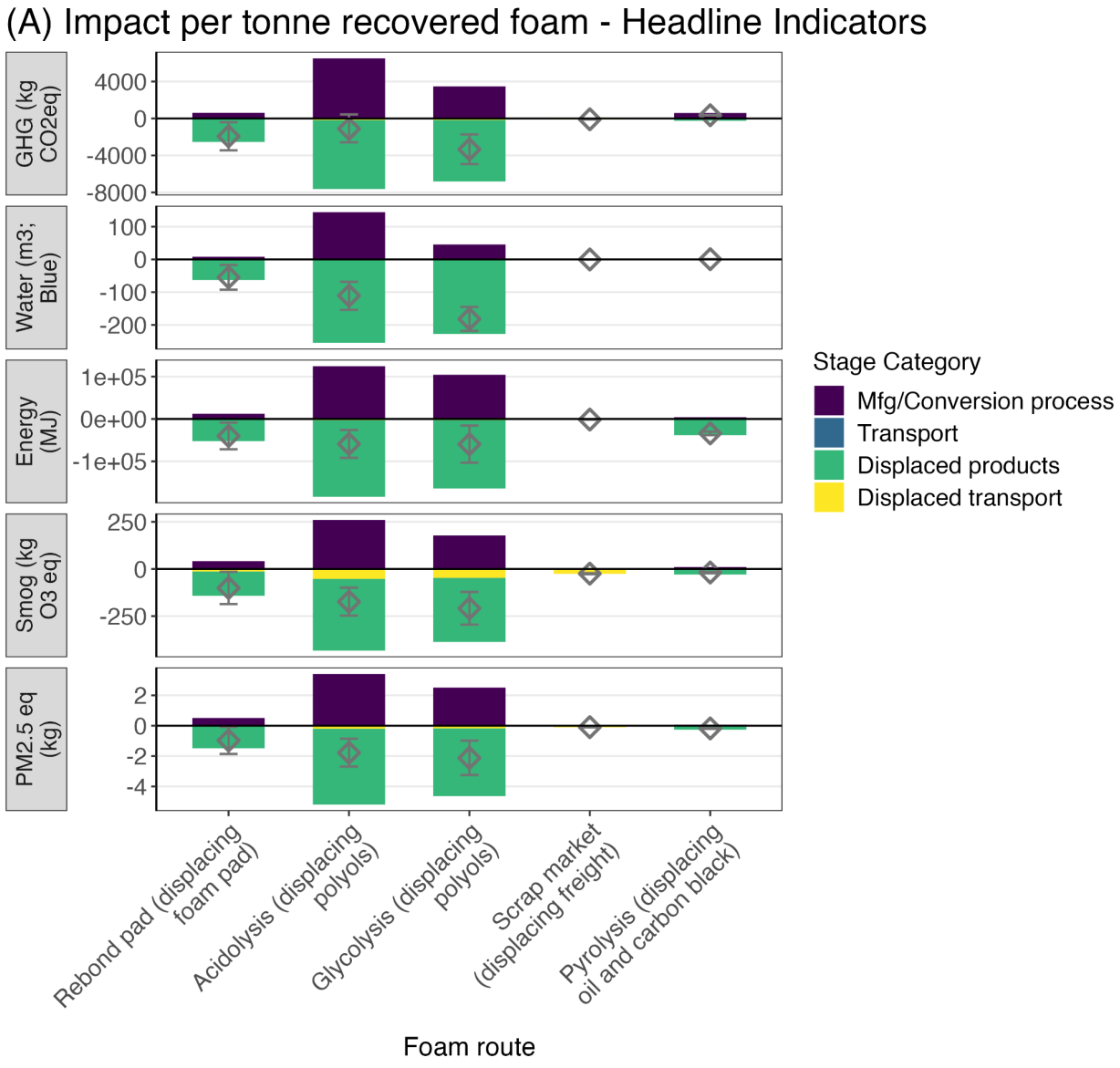

Health, Cancer (Tox. Units)
6e-06
4e-06
2e-06
0e+00
Health, NonCancer (Tox. Units)
7.5e-07
5.0e-07
2.5e-07
0.0e+00
Ozone depl. (kg CFC-11 eq)
1.25e-06
1.00e-06
7.50e-07
5.00e-07
2.50e-07
0.00e+00
Eutroph. (kg N eq)
0.004
0.003
0.002
0.001
0.000
Acidification (kg SO2 eq)
0.06
0.04
0.02
0.00
Energy, Fossil (MJ)
150
100
50
0
diesel
electricity
equip
gasoline
ppe
propane
supplies
water
Processing input (primary deconstrution)

Figure 4.6. Impacts of the different foam disposition routes. These results do not include impacts from Collection or Primary deconstruction. They represent the use of one tonne of recovered foam.



(B) Impact per tonne recovered foam - Supp. Indicators

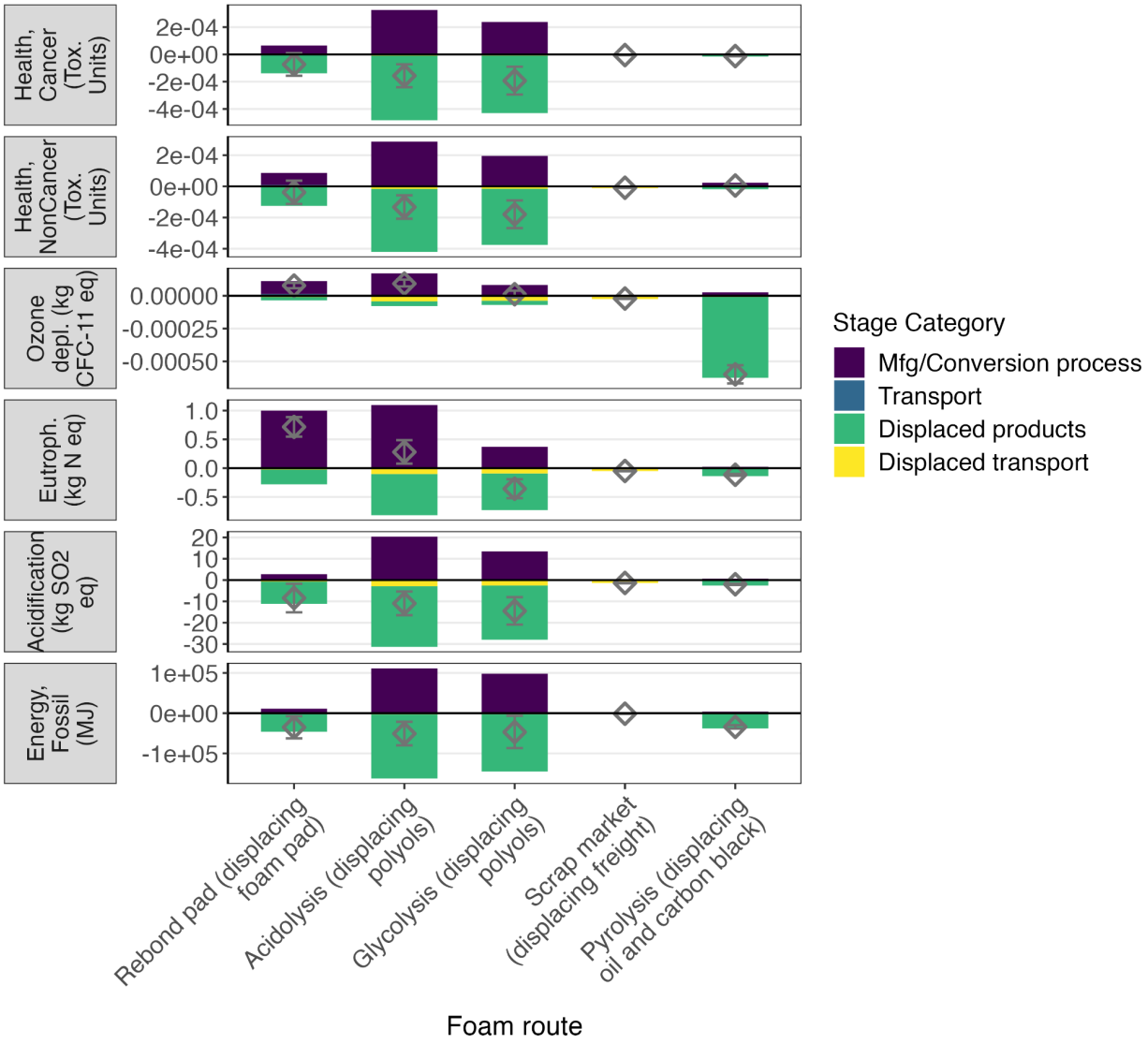
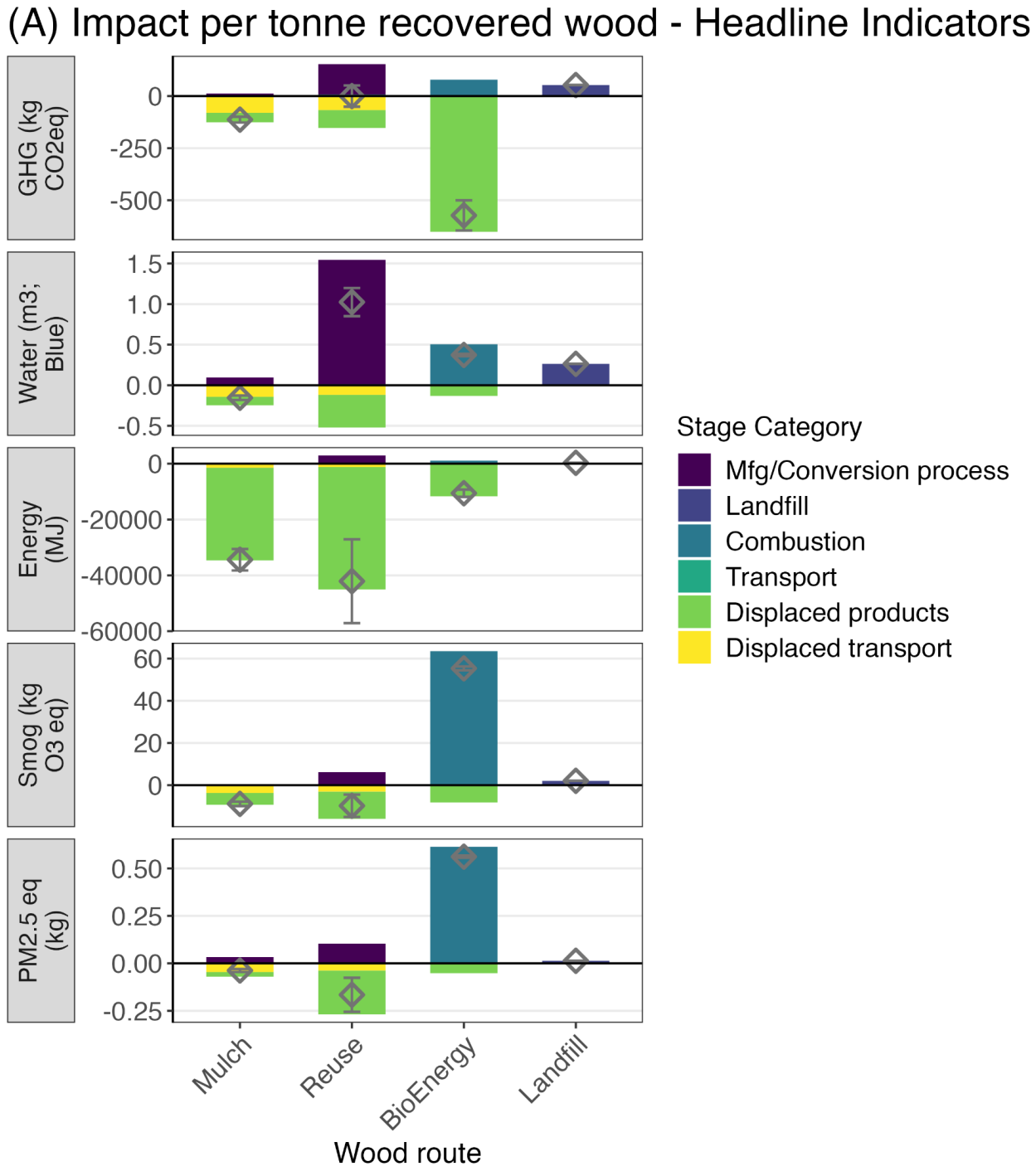


Figure 4.7. Impacts of different wood disposition routes. These results do not include impacts from Collection or Primary deconstruction. They represent the use of one tonne of recovered wood.



(B) Impact per tonne recovered wood - Supp. Indicators

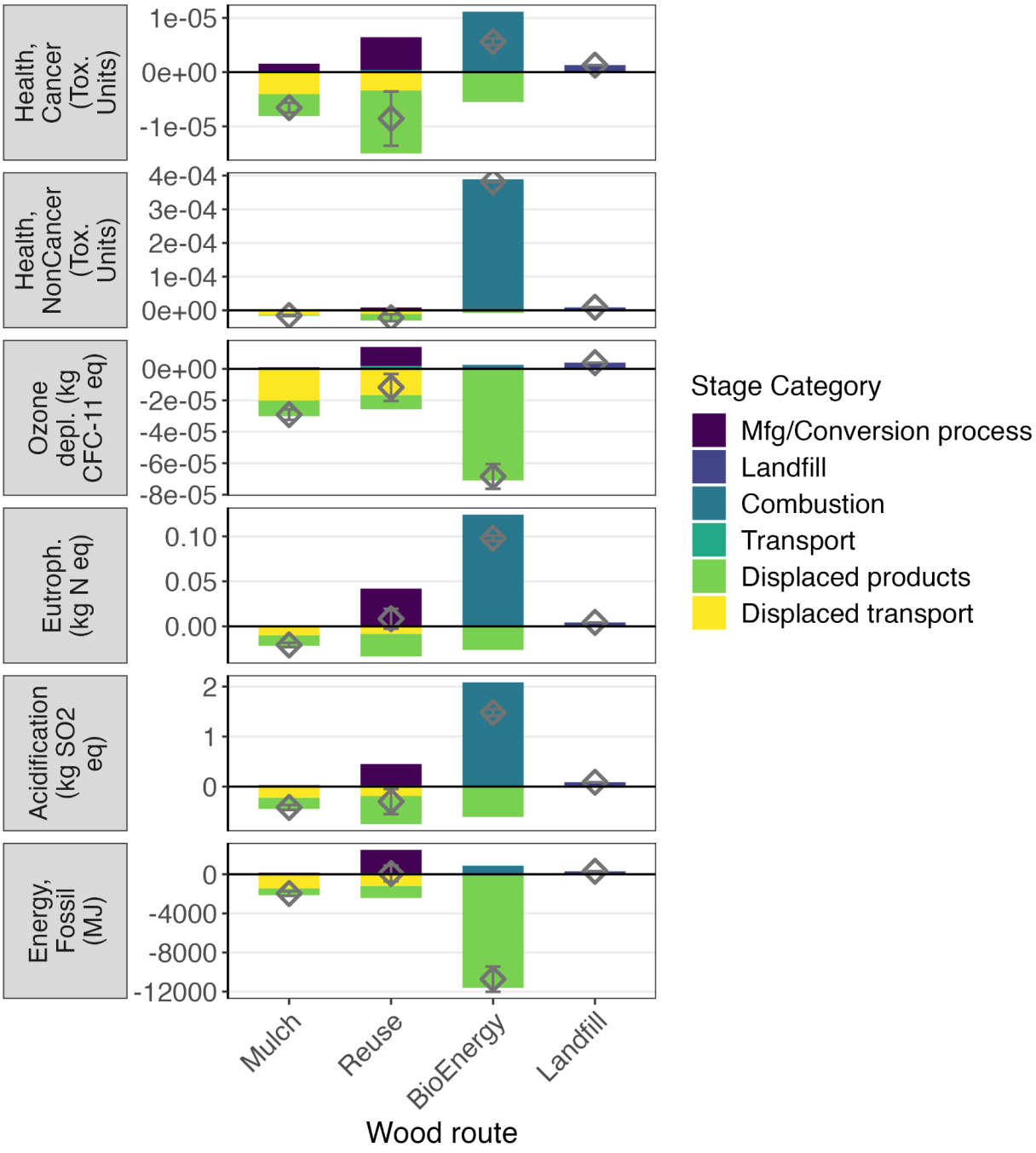
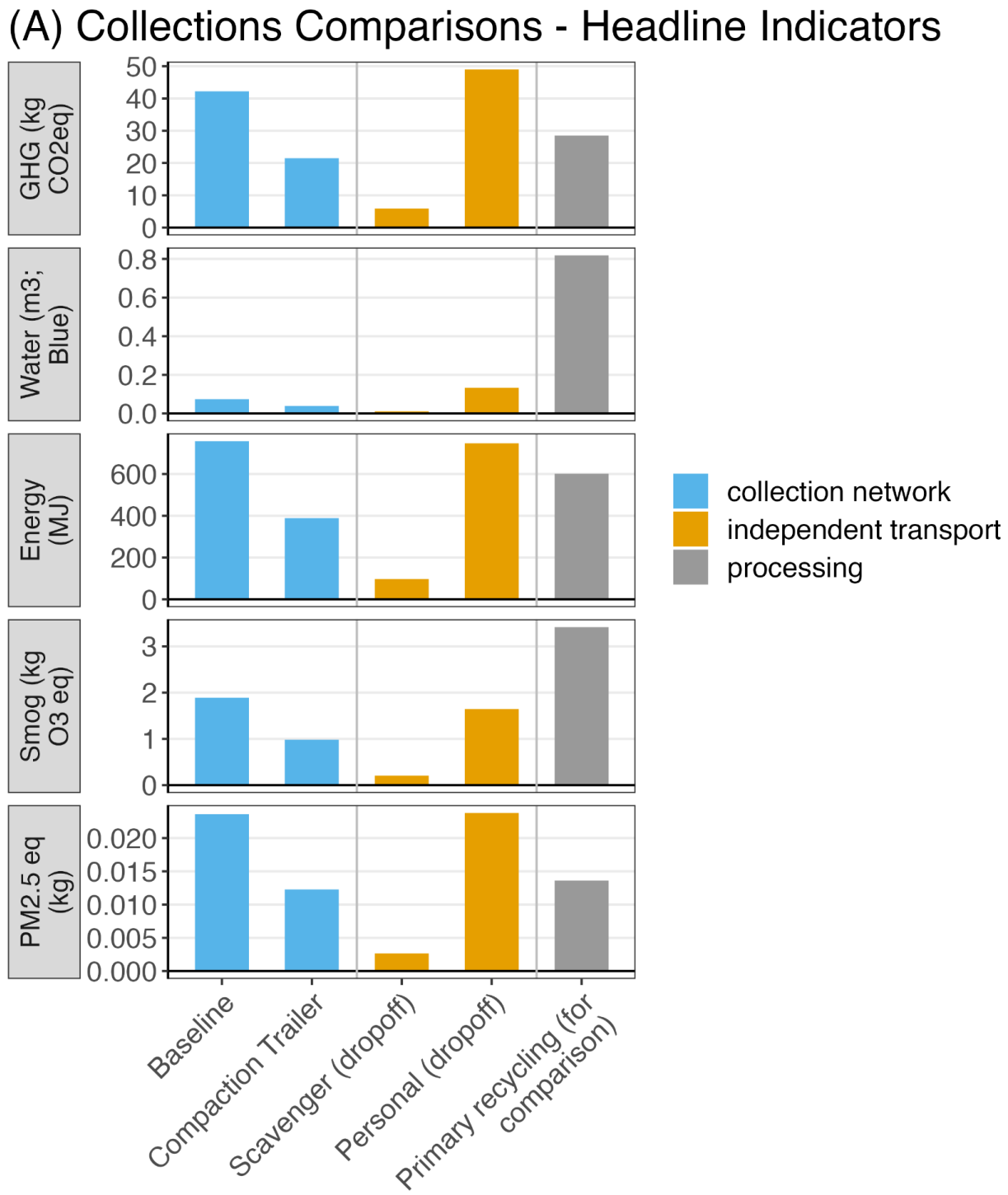
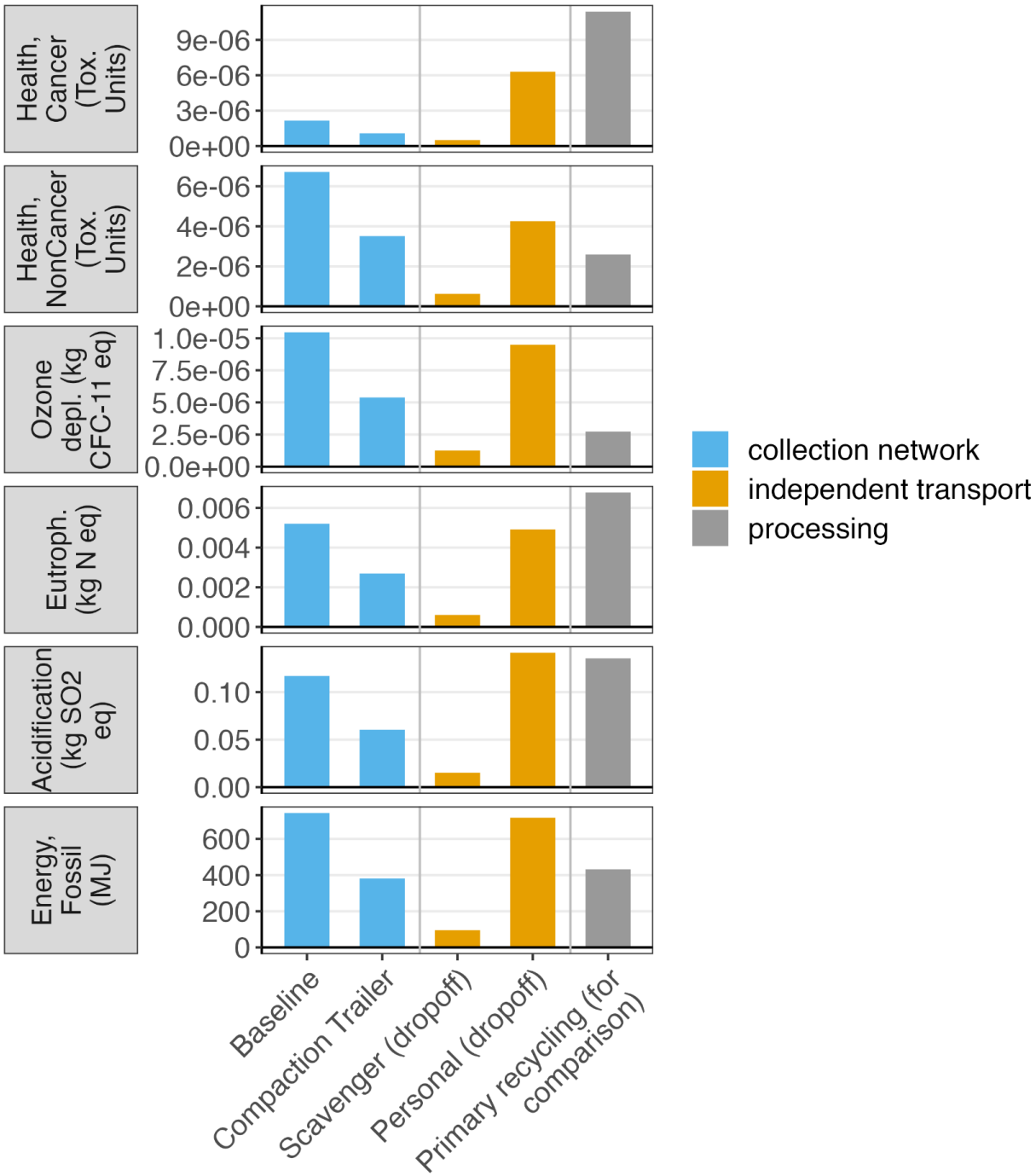


Figure 4.8. Impacts associated with different collection scenarios. Blue bars (left two) represent the baseline collection freight impacts and an alternative “compaction trailer” scenario. Orange bars represent independent scavenger and consumer transport scenarios (described in main text). The gray bar shows the impacts of the primary recycling process, for comparison.



(B) Collections Comparisons - Supp. Indicators



2.3 Tabular Data: Incurred, Displaced, and Net total

Data for Figure ES.1. and Figure 4.1: Overall results of the LCA study. Impacts of recycling and managing 1.6 million mattress recycling in CA (yr2021).

Scenario	Impact Type	Incurred, Displaced	result	result_lo	result_hi
Baseline (CA 2021)	GHG (kt CO2eq)	Incurred	11.3	11.3	11.3
Baseline (CA 2021)	GHG (kt CO2eq)	Displaced	-49.9	-67.0	-32.8
Baseline (CA 2021)	GHG (kt CO2eq)	Net	-38.7	-55.7	-21.6
Baseline (CA 2021)	Water (k m3; Blue)	Incurred	115.1	115.1	115.1
Baseline (CA 2021)	Water (k m3; Blue)	Displaced	-3,488.7	-4,467.3	-2,510.1
Baseline (CA 2021)	Water (k m3; Blue)	Net	-3,373.6	-4,352.2	-2,395.0
Baseline (CA 2021)	Energy (TJ)	Incurred	192.9	192.9	192.9
Baseline (CA 2021)	Energy (TJ)	Displaced	-901.8	-1,240.9	-562.8
Baseline (CA 2021)	Energy (TJ)	Net	-708.9	-1,048.0	-369.8
Baseline (CA 2021)	Smog (t O3 eq)	Incurred	778.0	778.0	778.0
Baseline (CA 2021)	Smog (t O3 eq)	Displaced	-2,135.3	-3,034.9	-1,235.7
Baseline (CA 2021)	Smog (t O3 eq)	Net	-1,357.3	-2,256.9	-457.6
Baseline (CA 2021)	PM2.5eq (t)	Incurred	8.1	8.1	8.1
Baseline (CA 2021)	PM2.5eq (t)	Displaced	-17.1	-25.9	-8.2
Baseline (CA 2021)	PM2.5eq (t)	Net	-9.0	-17.8	-0.1
Baseline (CA 2021)	Health, Cancer (Tox. Units)	Incurred	1.3	1.3	1.3
Baseline (CA 2021)	Health, Cancer (Tox. Units)	Displaced	-2.0	-2.9	-1.0
Baseline (CA 2021)	Health, Cancer (Tox. Units)	Net	-0.6	-1.6	0.3
Baseline (CA 2021)	Health, NonCancer (Tox. Units)	Incurred	2.9	2.9	2.9
Baseline (CA 2021)	Health, NonCancer (Tox. Units)	Displaced	-0.7	-1.5	0.1
Baseline (CA 2021)	Health, NonCancer (Tox. Units)	Net	2.2	1.4	3.0
Baseline (CA 2021)	Ozone depl. (kg CFC-11 eq)	Incurred	1.9	1.9	1.9
Baseline (CA 2021)	Ozone depl. (kg CFC-11 eq)	Displaced	-2.5	-3.4	-1.7
Baseline (CA 2021)	Ozone depl. (kg CFC-11 eq)	Net	-0.7	-1.5	0.2
Baseline (CA 2021)	Eutroph. (t N eq)	Incurred	9.5	9.5	9.5
Baseline (CA 2021)	Eutroph. (t N eq)	Displaced	-6.0	-8.3	-3.8

Baseline (CA 2021)	Eutroph. (t N eq)	Net	3.5	1.3	5.7
Baseline (CA 2021)	Acidification (t SO2 eq)	Incurred	42.9	42.9	42.9
Baseline (CA 2021)	Acidification (t SO2 eq)	Displaced	-147.9	-218.2	-77.6
Baseline (CA 2021)	Acidification (t SO2 eq)	Net	-105.0	-175.3	-34.7
Baseline (CA 2021)	Energy, Fossil (TJ)	Incurred	173.4	173.4	173.4
Baseline (CA 2021)	Energy, Fossil (TJ)	Displaced	-726.1	-1,013.6	-438.6
Baseline (CA 2021)	Energy, Fossil (TJ)	Net	-552.7	-840.3	-265.2

Data for Figure 2.1: Sankey chart overview of material through the primary recycling system

mfaType	flowType	type	ktonne
collections	mixed units	Collection Site	26.61
collections	mixed units	Commercial Sources	9.36
collections	mixed units	Dropoff, Incentive	2.97
collections	mixed units	Non-program Unit Recycling	0.72
collections	mixed units	Collection Events	0.4
collections	mixed units	Dropoff, No incentive	0.39
collections	mixed units	Illegal Dumping	0.24
outputs	Steel	recycle	15.13
outputs	Waste to Landfill	dispose	9.26
outputs	Foam	recycle	4.77
outputs	Quilt	recycle	3.79
outputs	Wood	recycle	3.51
outputs	Wood	energy	1.59
outputs	Whole unit (reused)	reuse	0.78
outputs	Foam (reused)	reuse	0.4
outputs	Cotton	recycle	0.39
outputs	Shoddy	recycle	0.22
outputs	Wood (reused)	reuse	0.2
outputs	Other fiber	recycle	0.17
outputs	Waste-to-Energy	energy	0.06

outputs	Cardboard	recycle	0.05
outputs	Steel (reused)	reuse	0.04
outputs	Plastic	recycle	0.01
outputs	Other fiber (reused)	reuse	0
outputs	Shoddy (reused)	reuse	0
outputs	Quilt (reused)	reuse	0
outputs	Cotton (reused)	reuse	0
transfer	pocket coil	NA	1.94
transfer	foam	NA	1.08
transfer	quilt	NA	0.78
transfer	other	NA	0.05

Data for Figure 4.5: Impacts of primary recycling facilities (one tonne of mattress processed)

Impact Type	diesel	electri-city	equip	gasoline	ppe	pro-pane	supplies	water	total
GHG (kg CO2eq)	5.0	9.2	4.6	0.6	0.4	5.0	3.5	0.2	28.5
PM2.5 eq (kg)	7.1E-04	1.8E-03	6.0E-03	8.0E-05	3.3E-04	1.5E-04	4.3E-03	2.8E-04	1.4E-02
Water (m3; Blue)	0.00	0.19	0.03	0.00	0.01	0.00	0.03	0.56	0.82
Energy (MJ)	77.6	302.5	72.8	9.7	10.1	74.8	51.0	3.2	601.7
Smog (kg O3 eq)	2.16	0.29	0.26	0.21	0.02	0.27	0.20	0.01	3.41
Health, Cancer (Tox. Units)	4.5E-10	3.5E-07	4.8E-06	5.7E-11	3.6E-08	3.9E-10	6.1E-06	2.5E-08	1.1E-05
Health, NonCancer (Tox. Units)	4.8E-08	6.9E-07	8.4E-07	6.0E-09	3.2E-08	4.7E-08	9.1E-07	1.6E-08	2.6E-06
Acidification (kg SO2 eq)	0.06	0.02	0.02	0.01	0.00	0.01	0.02	0.00	0.14
Ozone depl. (kg CFC-11 eq)	3.3E-08	1.2E-06	2.8E-07	4.1E-09	9.3E-07	3.2E-08	2.3E-07	1.3E-08	2.7E-06
Eutroph. (kg N eq)	3.9E-03	8.4E-04	5.4E-04	3.7E-04	1.2E-04	5.3E-04	4.7E-04	1.9E-05	6.8E-03
Energy, Fossil (MJ)	76.8	151.5	63.2	9.6	9.1	74.0	45.5	2.5	432.3

Data for Figure 4.2: Impacts of recycling one tonne of mattresses; six system scenarios

Scenario	Impact Type	Incurred, Displaced	result	result_lo	result_hi
Baseline	GHG (t CO2eq)	Incurred	0.236	0.236	0.236
Baseline	GHG (t CO2eq)	Displaced	-0.915	-1.229	-0.672
Baseline	GHG (t CO2eq)	Net	-0.679	-0.993	-0.436
Baseline	Water (m3; Blue)	Incurred	2.266	2.266	2.266
Baseline	Water (m3; Blue)	Displaced	-77.820	-99.237	-58.168
Baseline	Water (m3; Blue)	Net	-75.554	-96.971	-55.902
Baseline	Energy (GJ)	Incurred	3.914	3.914	3.914
Baseline	Energy (GJ)	Displaced	-15.695	-21.851	-11.009
Baseline	Energy (GJ)	Net	-11.781	-17.937	-7.095
Baseline	Smog (kg O3 eq)	Incurred	16.270	16.270	16.270
Baseline	Smog (kg O3 eq)	Displaced	-36.307	-52.648	-23.970
Baseline	Smog (kg O3 eq)	Net	-20.037	-36.378	-7.700
Baseline	PM2.5 eq (kg)	Incurred	0.163	0.163	0.163
Baseline	PM2.5 eq (kg)	Displaced	-0.239	-0.395	-0.125
Baseline	PM2.5 eq (kg)	Net	-0.076	-0.232	0.038
Baseline	Health, Cancer (Tox. Units)	Incurred	2.83E-05	2.83E-05	2.83E-05
Baseline	Health, Cancer (Tox. Units)	Displaced	-3.14E-05	-4.92E-05	-1.75E-05
Baseline	Health, Cancer (Tox. Units)	Net	-3.14E-06	-2.10E-05	1.08E-05
Baseline	Health, NonCancer (Tox. Units)	Incurred	6.63E-05	6.63E-05	6.63E-05
Baseline	Health, NonCancer (Tox. Units)	Displaced	-2.78E-06	-1.69E-05	7.80E-06
Baseline	Health, NonCancer (Tox. Units)	Net	6.35E-05	4.94E-05	7.41E-05
Baseline	Ozone depl. (g CFC-11 eq)	Incurred	0.038	0.038	0.038
Baseline	Ozone depl. (g CFC-11 eq)	Displaced	-0.060	-0.080	-0.041

Baseline	Ozone depl. (g CFC-11 eq)	Net	-0.022	-0.042	-0.003
Baseline	Eutroph. (kg N eq)	Incurred	0.164	0.164	0.164
Baseline	Eutroph. (kg N eq)	Displaced	-0.116	-0.160	-0.081
Baseline	Eutroph. (kg N eq)	Net	0.048	0.005	0.083
Baseline	Acidification (kg SO2 eq)	Incurred	0.867	0.867	0.867
Baseline	Acidification (kg SO2 eq)	Displaced	-2.325	-3.595	-1.369
Baseline	Acidification (kg SO2 eq)	Net	-1.459	-2.729	-0.503
Baseline	Energy, Fossil (GJ)	Incurred	3.512	3.512	3.512
Baseline	Energy, Fossil (GJ)	Displaced	-12.150	-17.297	-8.300
Baseline	Energy, Fossil (GJ)	Net	-8.639	-13.785	-4.789
Baseline, scrap foam	GHG (t CO2eq)	Incurred	0.166	0.166	0.166
Baseline, scrap foam	GHG (t CO2eq)	Displaced	-0.749	-0.886	-0.623
Baseline, scrap foam	GHG (t CO2eq)	Net	-0.583	-0.720	-0.457
Baseline, scrap foam	Water (m3; Blue)	Incurred	1.321	1.321	1.321
Baseline, scrap foam	Water (m3; Blue)	Displaced	-73.418	-90.417	-56.710
Baseline, scrap foam	Water (m3; Blue)	Net	-72.096	-89.096	-55.389
Baseline, scrap foam	Energy (GJ)	Incurred	2.525	2.525	2.525
Baseline, scrap foam	Energy (GJ)	Displaced	-12.224	-14.724	-9.967
Baseline, scrap foam	Energy (GJ)	Net	-9.699	-12.199	-7.442
Baseline, scrap foam	Smog (kg O3 eq)	Incurred	11.484	11.484	11.484
Baseline, scrap foam	Smog (kg O3 eq)	Displaced	-29.283	-35.935	-23.293
Baseline, scrap foam	Smog (kg O3 eq)	Net	-17.799	-24.451	-11.809
Baseline, scrap foam	PM2.5 eq (kg)	Incurred	0.104	0.104	0.104
Baseline, scrap foam	PM2.5 eq (kg)	Displaced	-0.147	-0.200	-0.101
Baseline, scrap foam	PM2.5 eq (kg)	Net	-0.043	-0.096	0.003
Baseline, scrap foam	Health, Cancer (Tox. Units)	Incurred	2.07E-05	2.07E-05	2.07E-05
Baseline, scrap foam	Health, Cancer (Tox. Units)	Displaced	-2.23E-05	-3.05E-05	-1.48E-05
Baseline, scrap foam	Health, Cancer (Tox. Units)	Net	-1.62E-06	-9.77E-06	5.90E-06

Baseline, scrap foam	Health, NonCancer (Tox. Units)	Incurred	5.65E-05	5.65E-05	5.65E-05
Baseline, scrap foam	Health, NonCancer (Tox. Units)	Displaced	4.64E-06	-8.17E-07	9.52E-06
Baseline, scrap foam	Health, NonCancer (Tox. Units)	Net	6.11E-05	5.57E-05	6.60E-05
Baseline, scrap foam	Ozone depl. (g CFC-11 eq)	Incurred	0.025	0.025	0.025
Baseline, scrap foam	Ozone depl. (g CFC-11 eq)	Displaced	-0.061	-0.078	-0.043
Baseline, scrap foam	Ozone depl. (g CFC-11 eq)	Net	-0.035	-0.053	-0.018
Baseline, scrap foam	Eutroph. (kg N eq)	Incurred	0.048	0.048	0.048
Baseline, scrap foam	Eutroph. (kg N eq)	Displaced	-0.103	-0.127	-0.080
Baseline, scrap foam	Eutroph. (kg N eq)	Net	-0.055	-0.079	-0.032
Baseline, scrap foam	Acidification (kg SO2 eq)	Incurred	0.551	0.551	0.551
Baseline, scrap foam	Acidification (kg SO2 eq)	Displaced	-1.704	-2.207	-1.254
Baseline, scrap foam	Acidification (kg SO2 eq)	Net	-1.153	-1.656	-0.703
Baseline, scrap foam	Energy, Fossil (GJ)	Incurred	2.255	2.255	2.255
Baseline, scrap foam	Energy, Fossil (GJ)	Displaced	-9.109	-11.032	-7.400
Baseline, scrap foam	Energy, Fossil (GJ)	Net	-6.854	-8.777	-5.145
Baseline w/ Compaction	GHG (t CO2eq)	Incurred	0.215	0.215	0.215
Baseline w/ Compaction	GHG (t CO2eq)	Displaced	-0.915	-1.229	-0.672
Baseline w/ Compaction	GHG (t CO2eq)	Net	-0.700	-1.014	-0.457
Baseline w/ Compaction	Water (m3; Blue)	Incurred	2.231	2.231	2.231
Baseline w/ Compaction	Water (m3; Blue)	Displaced	-77.820	-99.237	-58.168
Baseline w/ Compaction	Water (m3; Blue)	Net	-75.590	-97.007	-55.938
Baseline w/ Compaction	Energy (GJ)	Incurred	3.546	3.546	3.546
Baseline w/ Compaction	Energy (GJ)	Displaced	-15.695	-21.851	-11.009
Baseline w/ Compaction	Energy (GJ)	Net	-12.149	-18.305	-7.463
Baseline w/ Compaction	Smog (kg O3 eq)	Incurred	15.363	15.363	15.363
Baseline w/ Compaction	Smog (kg O3 eq)	Displaced	-36.307	-52.648	-23.970
Baseline w/ Compaction	Smog (kg O3 eq)	Net	-20.944	-37.285	-8.606
Baseline w/ Compaction	PM2.5 eq (kg)	Incurred	0.152	0.152	0.152

Baseline w/ Compaction	PM2.5 eq (kg)	Displaced	-0.239	-0.395	-0.125
Baseline w/ Compaction	PM2.5 eq (kg)	Net	-0.088	-0.244	0.027
Baseline w/ Compaction	Health, Cancer (Tox. Units)	Incurred	2.72E-05	2.72E-05	2.72E-05
Baseline w/ Compaction	Health, Cancer (Tox. Units)	Displaced	-3.14E-05	-4.92E-05	-1.75E-05
Baseline w/ Compaction	Health, Cancer (Tox. Units)	Net	-4.22E-06	-2.20E-05	9.71E-06
Baseline w/ Compaction	Health, NonCancer (Tox. Units)	Incurred	6.31E-05	6.31E-05	6.31E-05
Baseline w/ Compaction	Health, NonCancer (Tox. Units)	Displaced	-2.78E-06	-1.69E-05	7.80E-06
Baseline w/ Compaction	Health, NonCancer (Tox. Units)	Net	6.03E-05	4.62E-05	7.09E-05
Baseline w/ Compaction	Ozone depl. (g CFC-11 eq)	Incurred	0.033	0.033	0.033
Baseline w/ Compaction	Ozone depl. (g CFC-11 eq)	Displaced	-0.060	-0.080	-0.041
Baseline w/ Compaction	Ozone depl. (g CFC-11 eq)	Net	-0.027	-0.047	-0.009
Baseline w/ Compaction	Eutroph. (kg N eq)	Incurred	0.162	0.162	0.162
Baseline w/ Compaction	Eutroph. (kg N eq)	Displaced	-0.116	-0.160	-0.081
Baseline w/ Compaction	Eutroph. (kg N eq)	Net	0.045	0.002	0.081
Baseline w/ Compaction	Acidification (kg SO2 eq)	Incurred	0.810	0.810	0.810
Baseline w/ Compaction	Acidification (kg SO2 eq)	Displaced	-2.325	-3.595	-1.369
Baseline w/ Compaction	Acidification (kg SO2 eq)	Net	-1.515	-2.785	-0.559
Baseline w/ Compaction	Energy, Fossil (GJ)	Incurred	3.151	3.151	3.151
Baseline w/ Compaction	Energy, Fossil (GJ)	Displaced	-12.150	-17.297	-8.300
Baseline w/ Compaction	Energy, Fossil (GJ)	Net	-9.000	-14.147	-5.150
Baseline w/ Chem. Recycle	GHG (t CO2eq)	Incurred	0.928	0.857	1.012
Baseline w/ Chem. Recycle	GHG (t CO2eq)	Displaced	-1.631	-1.866	-1.408
Baseline w/ Chem. Recycle	GHG (t CO2eq)	Net	-0.703	-1.010	-0.395
Baseline w/ Chem. Recycle	Water (m3; Blue)	Incurred	18.227	16.473	19.859

Baseline w/ Chem. Recycle	Water (m3; Blue)	Displaced	-103.293	-123.612	-83.266
Baseline w/ Chem. Recycle	Water (m3; Blue)	Net	-85.066	-107.139	-63.407
Baseline w/ Chem. Recycle	Energy (GJ)	Incurred	17.117	15.657	18.598
Baseline w/ Chem. Recycle	Energy (GJ)	Displaced	-33.559	-38.430	-28.932
Baseline w/ Chem. Recycle	Energy (GJ)	Net	-16.442	-22.773	-10.334
Baseline w/ Chem. Recycle	Smog (kg O3 eq)	Incurred	41.845	38.820	44.943
Baseline w/ Chem. Recycle	Smog (kg O3 eq)	Displaced	-77.096	-89.061	-65.793
Baseline w/ Chem. Recycle	Smog (kg O3 eq)	Net	-35.251	-50.242	-20.851
Baseline w/ Chem. Recycle	PM2.5 eq (kg)	Incurred	0.503	0.464	0.544
Baseline w/ Chem. Recycle	PM2.5 eq (kg)	Displaced	-0.744	-0.863	-0.632
Baseline w/ Chem. Recycle	PM2.5 eq (kg)	Net	-0.241	-0.400	-0.088
Baseline w/ Chem. Recycle	Health, Cancer (Tox. Units)	Incurred	5.88E-05	5.52E-05	6.24E-05
Baseline w/ Chem. Recycle	Health, Cancer (Tox. Units)	Displaced	-7.82E-05	-9.26E-05	-6.45E-05
Baseline w/ Chem. Recycle	Health, Cancer (Tox. Units)	Net	-1.94E-05	-3.74E-05	-2.05E-06
Baseline w/ Chem. Recycle	Health, NonCancer (Tox. Units)	Incurred	8.98E-05	8.65E-05	9.32E-05
Baseline w/ Chem. Recycle	Health, NonCancer (Tox. Units)	Displaced	-4.32E-05	-5.40E-05	-3.30E-05
Baseline w/ Chem. Recycle	Health, NonCancer (Tox. Units)	Net	4.65E-05	3.25E-05	6.02E-05
Baseline w/ Chem. Recycle	Ozone depl. (g CFC-11 eq)	Incurred	0.045	0.043	0.047
Baseline w/ Chem. Recycle	Ozone depl. (g CFC-11 eq)	Displaced	-0.067	-0.085	-0.049
Baseline w/ Chem. Recycle	Ozone depl. (g CFC-11 eq)	Net	-0.022	-0.042	-0.001

Baseline w/ Chem. Recycle	Eutroph. (kg N eq)	Incurred	0.176	0.163	0.190
Baseline w/ Chem. Recycle	Eutroph. (kg N eq)	Displaced	-0.192	-0.226	-0.160
Baseline w/ Chem. Recycle	Eutroph. (kg N eq)	Net	-0.016	-0.063	0.030
Baseline w/ Chem. Recycle	Acidification (kg SO2 eq)	Incurred	2.934	2.699	3.181
Baseline w/ Chem. Recycle	Acidification (kg SO2 eq)	Displaced	-5.214	-6.107	-4.374
Baseline w/ Chem. Recycle	Acidification (kg SO2 eq)	Net	-2.280	-3.408	-1.193
Baseline w/ Chem. Recycle	Energy, Fossil (GJ)	Incurred	15.293	13.987	16.621
Baseline w/ Chem. Recycle	Energy, Fossil (GJ)	Displaced	-27.947	-31.964	-24.146
Baseline w/ Chem. Recycle	Energy, Fossil (GJ)	Net	-12.654	-17.977	-7.525
Incineration	GHG (t CO2eq)	Incurred	1.203	1.203	1.203
Incineration	GHG (t CO2eq)	Displaced	-0.918	-1.020	-0.816
Incineration	GHG (t CO2eq)	Net	0.285	0.183	0.387
Incineration	Water (m3; Blue)	Incurred	2.581	2.581	2.581
Incineration	Water (m3; Blue)	Displaced	-38.075	-42.306	-33.845
Incineration	Water (m3; Blue)	Net	-35.494	-39.725	-31.264
Incineration	Energy (GJ)	Incurred	2.157	2.157	2.157
Incineration	Energy (GJ)	Displaced	-11.547	-12.829	-10.264
Incineration	Energy (GJ)	Net	-9.390	-10.673	-8.107
Incineration	Smog (kg O3 eq)	Incurred	28.605	28.605	28.605
Incineration	Smog (kg O3 eq)	Displaced	-20.543	-22.826	-18.261
Incineration	Smog (kg O3 eq)	Net	8.062	5.779	10.344
Incineration	PM2.5 eq (kg)	Incurred	0.065	0.065	0.065
Incineration	PM2.5 eq (kg)	Displaced	-0.047	-0.052	-0.042
Incineration	PM2.5 eq (kg)	Net	0.018	0.013	0.023
Incineration	Health, Cancer (Tox. Units)	Incurred	3.71E-05	3.71E-05	3.71E-05

Incineration	Health, Cancer (Tox. Units)	Displaced	-3.61E-06	-4.01E-06	-3.21E-06
Incineration	Health, Cancer (Tox. Units)	Net	3.35E-05	3.31E-05	3.39E-05
Incineration	Health, NonCancer (Tox. Units)	Incurred	5.03E-05	5.03E-05	5.03E-05
Incineration	Health, NonCancer (Tox. Units)	Displaced	2.95E-05	3.28E-05	2.62E-05
Incineration	Health, NonCancer (Tox. Units)	Net	7.98E-05	8.30E-05	7.65E-05
Incineration	Ozone depl. (g CFC-11 eq)	Incurred	0.022	0.022	0.022
Incineration	Ozone depl. (g CFC-11 eq)	Displaced	-0.054	-0.060	-0.048
Incineration	Ozone depl. (g CFC-11 eq)	Net	-0.032	-0.038	-0.026
Incineration	Eutroph. (kg N eq)	Incurred	0.055	0.055	0.055
Incineration	Eutroph. (kg N eq)	Displaced	-0.068	-0.075	-0.060
Incineration	Eutroph. (kg N eq)	Net	-0.012	-0.020	-0.005
Incineration	Acidification (kg SO2 eq)	Incurred	0.994	0.994	0.994
Incineration	Acidification (kg SO2 eq)	Displaced	-0.866	-0.963	-0.770
Incineration	Acidification (kg SO2 eq)	Net	0.127	0.031	0.223
Incineration	Energy, Fossil (GJ)	Incurred	1.977	1.977	1.977
Incineration	Energy, Fossil (GJ)	Displaced	-12.072	-13.413	-10.730
Incineration	Energy, Fossil (GJ)	Net	-10.094	-11.436	-8.753
Pyrolysis, whole unit	GHG (t CO2eq)	Incurred	0.638	0.638	0.638
Pyrolysis, whole unit	GHG (t CO2eq)	Displaced	-0.787	-0.875	-0.700
Pyrolysis, whole unit	GHG (t CO2eq)	Net	-0.150	-0.237	-0.062
Pyrolysis, whole unit	Water (m3; Blue)	Incurred	1.061	1.061	1.061
Pyrolysis, whole unit	Water (m3; Blue)	Displaced	-38.959	-43.287	-34.630
Pyrolysis, whole unit	Water (m3; Blue)	Net	-37.898	-42.226	-33.569
Pyrolysis, whole unit	Energy (GJ)	Incurred	5.193	5.193	5.193
Pyrolysis, whole unit	Energy (GJ)	Displaced	-22.506	-25.006	-20.005
Pyrolysis, whole unit	Energy (GJ)	Net	-17.312	-19.813	-14.812
Pyrolysis, whole unit	Smog (kg O3 eq)	Incurred	13.107	13.107	13.107

Pyrolysis, whole unit	Smog (kg O3 eq)	Displaced	-30.851	-34.279	-27.423
Pyrolysis, whole unit	Smog (kg O3 eq)	Net	-17.744	-21.172	-14.316
Pyrolysis, whole unit	PM2.5 eq (kg)	Incurred	0.109	0.109	0.109
Pyrolysis, whole unit	PM2.5 eq (kg)	Displaced	-0.210	-0.233	-0.187
Pyrolysis, whole unit	PM2.5 eq (kg)	Net	-0.101	-0.124	-0.078
Pyrolysis, whole unit	Health, Cancer (Tox. Units)	Incurred	0.000	0.000	0.000
Pyrolysis, whole unit	Health, Cancer (Tox. Units)	Displaced	0.000	0.000	0.000
Pyrolysis, whole unit	Health, Cancer (Tox. Units)	Net	0.000	0.000	0.000
Pyrolysis, whole unit	Health, NonCancer (Tox. Units)	Incurred	0.000	0.000	0.000
Pyrolysis, whole unit	Health, NonCancer (Tox. Units)	Displaced	0.000	0.000	0.000
Pyrolysis, whole unit	Health, NonCancer (Tox. Units)	Net	0.000	0.000	0.000
Pyrolysis, whole unit	Ozone depl. (g CFC-11 eq)	Incurred	0.041	0.041	0.041
Pyrolysis, whole unit	Ozone depl. (g CFC-11 eq)	Displaced	-0.275	-0.306	-0.245
Pyrolysis, whole unit	Ozone depl. (g CFC-11 eq)	Net	-0.234	-0.264	-0.203
Pyrolysis, whole unit	Eutroph. (kg N eq)	Incurred	0.031	0.031	0.031
Pyrolysis, whole unit	Eutroph. (kg N eq)	Displaced	-0.115	-0.128	-0.102
Pyrolysis, whole unit	Eutroph. (kg N eq)	Net	-0.084	-0.097	-0.071
Pyrolysis, whole unit	Acidification (kg SO2 eq)	Incurred	0.786	0.786	0.786
Pyrolysis, whole unit	Acidification (kg SO2 eq)	Displaced	-1.945	-2.161	-1.729
Pyrolysis, whole unit	Acidification (kg SO2 eq)	Net	-1.159	-1.375	-0.943
Pyrolysis, whole unit	Energy, Fossil (GJ)	Incurred	4.983	4.983	4.983
Pyrolysis, whole unit	Energy, Fossil (GJ)	Displaced	-22.990	-25.545	-20.436
Pyrolysis, whole unit	Energy, Fossil (GJ)	Net	-18.008	-20.562	-15.453

Data for Figure 4.3: Impacts of recycling one tonne of mattresses; five types of mattresses, and one mix of types

Scenario	Impact Type	Incurred, Displaced	result	result_lo	result_hi
Modeled Mix	GHG (t CO2eq)	Incurred	0.27	0.27	0.27
Modeled Mix	GHG (t CO2eq)	Displaced	-0.97	-1.35	-0.69
Modeled Mix	GHG (t CO2eq)	Net	-0.70	-1.08	-0.42
Modeled Mix	Water (m3; Blue)	Incurred	2.67	2.67	2.67
Modeled Mix	Water (m3; Blue)	Displaced	-48.80	-61.39	-38.51
Modeled Mix	Water (m3; Blue)	Net	-46.13	-58.72	-35.85
Modeled Mix	Energy (GJ)	Incurred	4.55	4.55	4.55
Modeled Mix	Energy (GJ)	Displaced	-16.46	-23.84	-11.00
Modeled Mix	Energy (GJ)	Net	-11.90	-19.28	-6.44
Modeled Mix	Smog (kg O3 eq)	Incurred	18.34	18.34	18.34
Modeled Mix	Smog (kg O3 eq)	Displaced	-37.25	-56.44	-23.31
Modeled Mix	Smog (kg O3 eq)	Net	-18.91	-38.09	-4.96
Modeled Mix	PM2.5 eq (kg)	Incurred	0.19	0.19	0.19
Modeled Mix	PM2.5 eq (kg)	Displaced	-0.25	-0.43	-0.12
Modeled Mix	PM2.5 eq (kg)	Net	-0.06	-0.25	0.07
Modeled Mix	Health, Cancer (Tox. Units)	Incurred	3.5E-05	3.5E-05	3.5E-05
Modeled Mix	Health, Cancer (Tox. Units)	Displaced	-3.4E-05	-5.5E-05	-1.8E-05
Modeled Mix	Health, Cancer (Tox. Units)	Net	1.2E-06	-2.0E-05	1.7E-05
Modeled Mix	Health, NonCancer (Tox. Units)	Incurred	6.8E-05	6.8E-05	6.8E-05
Modeled Mix	Health, NonCancer (Tox. Units)	Displaced	8.5E-06	-4.3E-06	1.7E-05
Modeled Mix	Health, NonCancer (Tox. Units)	Net	7.6E-05	6.4E-05	8.5E-05
Modeled Mix	Ozone depl. (g CFC-11 eq)	Incurred	0.04	0.04	0.04
Modeled Mix	Ozone depl. (g CFC-11 eq)	Displaced	-0.05	-0.07	-0.04
Modeled Mix	Ozone depl. (g CFC-11 eq)	Net	-0.01	-0.03	0.01
Modeled Mix	Eutroph. (kg N eq)	Incurred	0.21	0.21	0.21
Modeled Mix	Eutroph. (kg N eq)	Displaced	-0.10	-0.14	-0.07
Modeled Mix	Eutroph. (kg N eq)	Net	0.11	0.07	0.14
Modeled Mix	Acidification (kg SO2 eq)	Incurred	1.00	1.00	1.00

Modeled Mix	Acidification (kg SO2 eq)	Displaced	-2.19	-3.62	-1.18
Modeled Mix	Acidification (kg SO2 eq)	Net	-1.19	-2.61	-0.18
Modeled Mix	Energy, Fossil (GJ)	Incurred	4.07	4.07	4.07
Modeled Mix	Energy, Fossil (GJ)	Displaced	-13.36	-19.70	-8.72
Modeled Mix	Energy, Fossil (GJ)	Net	-9.29	-15.63	-4.64
Pocket Coil	GHG (t CO2eq)	Incurred	0.29	0.29	0.29
Pocket Coil	GHG (t CO2eq)	Displaced	-1.16	-1.60	-0.82
Pocket Coil	GHG (t CO2eq)	Net	-0.86	-1.31	-0.53
Pocket Coil	Water (m3; Blue)	Incurred	2.87	2.87	2.87
Pocket Coil	Water (m3; Blue)	Displaced	-59.97	-74.89	-47.79
Pocket Coil	Water (m3; Blue)	Net	-57.10	-72.01	-44.92
Pocket Coil	Energy (GJ)	Incurred	5.19	5.19	5.19
Pocket Coil	Energy (GJ)	Displaced	-15.96	-24.24	-9.97
Pocket Coil	Energy (GJ)	Net	-10.77	-19.05	-4.78
Pocket Coil	Smog (kg O3 eq)	Incurred	18.84	18.84	18.84
Pocket Coil	Smog (kg O3 eq)	Displaced	-43.57	-66.14	-27.22
Pocket Coil	Smog (kg O3 eq)	Net	-24.74	-47.30	-8.38
Pocket Coil	PM2.5 eq (kg)	Incurred	0.19	0.19	0.19
Pocket Coil	PM2.5 eq (kg)	Displaced	-0.28	-0.50	-0.13
Pocket Coil	PM2.5 eq (kg)	Net	-0.09	-0.30	0.07
Pocket Coil	Health, Cancer (Tox. Units)	Incurred	4.5E-05	4.5E-05	4.5E-05
Pocket Coil	Health, Cancer (Tox. Units)	Displaced	-3.7E-05	-6.2E-05	-1.9E-05
Pocket Coil	Health, Cancer (Tox. Units)	Net	7.9E-06	-1.6E-05	2.6E-05
Pocket Coil	Health, NonCancer (Tox. Units)	Incurred	5.6E-05	5.6E-05	5.6E-05
Pocket Coil	Health, NonCancer (Tox. Units)	Displaced	1.6E-05	1.6E-06	2.5E-05
Pocket Coil	Health, NonCancer (Tox. Units)	Net	7.2E-05	5.8E-05	8.1E-05
Pocket Coil	Ozone depl. (g CFC-11 eq)	Incurred	0.05	0.05	0.05
Pocket Coil	Ozone depl. (g CFC-11 eq)	Displaced	-0.04	-0.06	-0.03
Pocket Coil	Ozone depl. (g CFC-11 eq)	Net	0.00	-0.01	0.02

Pocket Coil	Eutroph. (kg N eq)	Incurred	0.24	0.24	0.24
Pocket Coil	Eutroph. (kg N eq)	Displaced	-0.11	-0.16	-0.08
Pocket Coil	Eutroph. (kg N eq)	Net	0.13	0.08	0.16
Pocket Coil	Acidification (kg SO2 eq)	Incurred	1.09	1.09	1.09
Pocket Coil	Acidification (kg SO2 eq)	Displaced	-2.52	-4.19	-1.34
Pocket Coil	Acidification (kg SO2 eq)	Net	-1.44	-3.11	-0.25
Pocket Coil	Energy, Fossil (GJ)	Incurred	4.64	4.64	4.64
Pocket Coil	Energy, Fossil (GJ)	Displaced	-15.59	-23.04	-10.14
Pocket Coil	Energy, Fossil (GJ)	Net	-10.95	-18.41	-5.50
Tied Spring	GHG (t CO2eq)	Incurred	0.22	0.22	0.22
Tied Spring	GHG (t CO2eq)	Displaced	-1.05	-1.36	-0.81
Tied Spring	GHG (t CO2eq)	Net	-0.83	-1.14	-0.58
Tied Spring	Water (m3; Blue)	Incurred	2.07	2.07	2.07
Tied Spring	Water (m3; Blue)	Displaced	-61.03	-73.59	-50.16
Tied Spring	Water (m3; Blue)	Net	-58.97	-71.52	-48.09
Tied Spring	Energy (GJ)	Incurred	3.69	3.69	3.69
Tied Spring	Energy (GJ)	Displaced	-13.37	-18.91	-9.22
Tied Spring	Energy (GJ)	Net	-9.68	-15.22	-5.53
Tied Spring	Smog (kg O3 eq)	Incurred	12.85	12.85	12.85
Tied Spring	Smog (kg O3 eq)	Displaced	-37.08	-52.29	-25.67
Tied Spring	Smog (kg O3 eq)	Net	-24.23	-39.45	-12.82
Tied Spring	PM2.5 eq (kg)	Incurred	0.13	0.13	0.13
Tied Spring	PM2.5 eq (kg)	Displaced	-0.20	-0.34	-0.10
Tied Spring	PM2.5 eq (kg)	Net	-0.07	-0.21	0.03
Tied Spring	Health, Cancer (Tox. Units)	Incurred	2.3E-05	2.3E-05	2.3E-05
Tied Spring	Health, Cancer (Tox. Units)	Displaced	-3.0E-05	-4.7E-05	-1.7E-05
Tied Spring	Health, Cancer (Tox. Units)	Net	-6.4E-06	-2.4E-05	7.0E-06
Tied Spring	Health, NonCancer (Tox. Units)	Incurred	5.0E-05	5.0E-05	5.0E-05
Tied Spring	Health, NonCancer (Tox. Units)	Displaced	2.4E-05	1.6E-05	2.8E-05

Tied Spring	Health, NonCancer (Tox. Units)	Net	7.4E-05	6.6E-05	7.8E-05
Tied Spring	Ozone depl. (g CFC-11 eq)	Incurred	0.04	0.04	0.04
Tied Spring	Ozone depl. (g CFC-11 eq)	Displaced	-0.07	-0.09	-0.05
Tied Spring	Ozone depl. (g CFC-11 eq)	Net	-0.03	-0.06	-0.01
Tied Spring	Eutroph. (kg N eq)	Incurred	0.15	0.15	0.15
Tied Spring	Eutroph. (kg N eq)	Displaced	-0.10	-0.14	-0.08
Tied Spring	Eutroph. (kg N eq)	Net	0.05	0.01	0.08
Tied Spring	Acidification (kg SO2 eq)	Incurred	0.74	0.74	0.74
Tied Spring	Acidification (kg SO2 eq)	Displaced	-1.96	-3.05	-1.17
Tied Spring	Acidification (kg SO2 eq)	Net	-1.22	-2.31	-0.43
Tied Spring	Energy, Fossil (GJ)	Incurred	3.35	3.35	3.35
Tied Spring	Energy, Fossil (GJ)	Displaced	-13.39	-18.44	-9.56
Tied Spring	Energy, Fossil (GJ)	Net	-10.04	-15.09	-6.21
All Foam	GHG (t CO2eq)	Incurred	0.55	0.55	0.55
All Foam	GHG (t CO2eq)	Displaced	-1.28	-2.40	-0.51
All Foam	GHG (t CO2eq)	Net	-0.73	-1.85	0.04
All Foam	Water (m3; Blue)	Incurred	6.74	6.74	6.74
All Foam	Water (m3; Blue)	Displaced	-34.05	-62.55	-14.12
All Foam	Water (m3; Blue)	Net	-27.31	-55.82	-7.39
All Foam	Energy (GJ)	Incurred	10.31	10.31	10.31
All Foam	Energy (GJ)	Displaced	-26.49	-49.60	-10.52
All Foam	Energy (GJ)	Net	-16.18	-39.28	-0.21
All Foam	Smog (kg O3 eq)	Incurred	35.87	35.87	35.87
All Foam	Smog (kg O3 eq)	Displaced	-72.13	-135.07	-28.65
All Foam	Smog (kg O3 eq)	Net	-36.27	-99.20	7.22
All Foam	PM2.5 eq (kg)	Incurred	0.41	0.41	0.41
All Foam	PM2.5 eq (kg)	Displaced	-0.76	-1.41	-0.30
All Foam	PM2.5 eq (kg)	Net	-0.35	-1.00	0.11
All Foam	Health, Cancer (Tox. Units)	Incurred	6.1E-05	6.1E-05	6.1E-05
All Foam	Health, Cancer (Tox. Units)	Displaced	-8.0E-05	-1.4E-04	-3.4E-05

All Foam	Health, Cancer (Tox. Units)	Net	-1.8E-05	-8.2E-05	2.7E-05
All Foam	Health, NonCancer (Tox. Units)	Incurred	9.5E-05	9.5E-05	9.5E-05
All Foam	Health, NonCancer (Tox. Units)	Displaced	-6.5E-05	-1.2E-04	-2.7E-05
All Foam	Health, NonCancer (Tox. Units)	Net	3.0E-05	-2.6E-05	6.9E-05
All Foam	Ozone depl. (g CFC-11 eq)	Incurred	0.10	0.10	0.10
All Foam	Ozone depl. (g CFC-11 eq)	Displaced	-0.05	-0.08	-0.03
All Foam	Ozone depl. (g CFC-11 eq)	Net	0.04	0.01	0.06
All Foam	Eutroph. (kg N eq)	Incurred	0.70	0.70	0.70
All Foam	Eutroph. (kg N eq)	Displaced	-0.15	-0.27	-0.06
All Foam	Eutroph. (kg N eq)	Net	0.56	0.43	0.64
All Foam	Acidification (kg SO2 eq)	Incurred	2.24	2.24	2.24
All Foam	Acidification (kg SO2 eq)	Displaced	-5.66	-10.60	-2.25
All Foam	Acidification (kg SO2 eq)	Net	-3.42	-8.36	-0.01
All Foam	Energy, Fossil (GJ)	Incurred	9.29	9.29	9.29
All Foam	Energy, Fossil (GJ)	Displaced	-23.33	-43.70	-9.26
All Foam	Energy, Fossil (GJ)	Net	-14.04	-34.42	0.03
All Wood Foundation	GHG (t CO2eq)	Incurred	0.15	0.15	0.15
All Wood Foundation	GHG (t CO2eq)	Displaced	-0.28	-0.32	-0.24
All Wood Foundation	GHG (t CO2eq)	Net	-0.13	-0.17	-0.09
All Wood Foundation	Water (m3; Blue)	Incurred	1.55	1.55	1.55
All Wood Foundation	Water (m3; Blue)	Displaced	-3.06	-3.93	-2.21
All Wood Foundation	Water (m3; Blue)	Net	-1.51	-2.38	-0.66
All Wood Foundation	Energy (GJ)	Incurred	2.46	2.46	2.46
All Wood Foundation	Energy (GJ)	Displaced	-25.94	-29.30	-22.60
All Wood Foundation	Energy (GJ)	Net	-23.48	-26.84	-20.14
All Wood Foundation	Smog (kg O3 eq)	Incurred	24.15	24.15	24.15
All Wood Foundation	Smog (kg O3 eq)	Displaced	-12.05	-13.93	-10.21
All Wood Foundation	Smog (kg O3 eq)	Net	12.10	10.21	13.93
All Wood Foundation	PM2.5 eq (kg)	Incurred	0.23	0.23	0.23

All Wood Foundation	PM2.5 eq (kg)	Displaced	-0.10	-0.12	-0.08
All Wood Foundation	PM2.5 eq (kg)	Net	0.13	0.12	0.15
All Wood Foundation	Health, Cancer (Tox. Units)	Incurred	2.3E-05	2.3E-05	2.3E-05
All Wood Foundation	Health, Cancer (Tox. Units)	Displaced	-1.8E-05	-2.2E-05	-1.3E-05
All Wood Foundation	Health, Cancer (Tox. Units)	Net	5.6E-06	1.1E-06	1.0E-05
All Wood Foundation	Health, NonCancer (Tox. Units)	Incurred	1.2E-04	1.2E-04	1.2E-04
All Wood Foundation	Health, NonCancer (Tox. Units)	Displaced	-1.7E-05	-2.0E-05	-1.4E-05
All Wood Foundation	Health, NonCancer (Tox. Units)	Net	1.0E-04	1.0E-04	1.1E-04
All Wood Foundation	Ozone depl. (g CFC-11 eq)	Incurred	0.02	0.02	0.02
All Wood Foundation	Ozone depl. (g CFC-11 eq)	Displaced	-0.06	-0.07	-0.05
All Wood Foundation	Ozone depl. (g CFC-11 eq)	Net	-0.04	-0.05	-0.03
All Wood Foundation	Eutroph. (kg N eq)	Incurred	0.05	0.05	0.05
All Wood Foundation	Eutroph. (kg N eq)	Displaced	-0.03	-0.04	-0.03
All Wood Foundation	Eutroph. (kg N eq)	Net	0.02	0.02	0.03
All Wood Foundation	Acidification (kg SO2 eq)	Incurred	0.93	0.93	0.93
All Wood Foundation	Acidification (kg SO2 eq)	Displaced	-0.68	-0.80	-0.57
All Wood Foundation	Acidification (kg SO2 eq)	Net	0.24	0.13	0.36
All Wood Foundation	Energy, Fossil (GJ)	Incurred	2.09	2.09	2.09
All Wood Foundation	Energy, Fossil (GJ)	Displaced	-4.82	-5.50	-4.15
All Wood Foundation	Energy, Fossil (GJ)	Net	-2.73	-3.42	-2.06
Foundation (not all wood)	GHG (t CO2eq)	Incurred	0.16	0.16	0.16
Foundation (not all wood)	GHG (t CO2eq)	Displaced	-0.75	-0.85	-0.65
Foundation (not all wood)	GHG (t CO2eq)	Net	-0.60	-0.70	-0.50
Foundation (not all wood)	Water (m3; Blue)	Incurred	1.52	1.52	1.52
Foundation (not all wood)	Water (m3; Blue)	Displaced	-42.74	-48.57	-37.01
Foundation (not all wood)	Water (m3; Blue)	Net	-41.23	-47.06	-35.49

Foundation (not all wood)	Energy (GJ)	Incurred	2.55	2.55	2.55
Foundation (not all wood)	Energy (GJ)	Displaced	-18.19	-20.72	-15.73
Foundation (not all wood)	Energy (GJ)	Net	-15.64	-18.17	-13.18
Foundation (not all wood)	Smog (kg O3 eq)	Incurred	16.72	16.72	16.72
Foundation (not all wood)	Smog (kg O3 eq)	Displaced	-21.51	-24.96	-18.27
Foundation (not all wood)	Smog (kg O3 eq)	Net	-4.79	-8.25	-1.55
Foundation (not all wood)	PM2.5 eq (kg)	Incurred	0.15	0.15	0.15
Foundation (not all wood)	PM2.5 eq (kg)	Displaced	-0.08	-0.10	-0.06
Foundation (not all wood)	PM2.5 eq (kg)	Net	0.07	0.05	0.09
Foundation (not all wood)	Health, Cancer (Tox. Units)	Incurred	2.3E-05	2.3E-05	2.3E-05
Foundation (not all wood)	Health, Cancer (Tox. Units)	Displaced	-1.9E-05	-2.5E-05	-1.3E-05
Foundation (not all wood)	Health, Cancer (Tox. Units)	Net	3.8E-06	-2.0E-06	9.5E-06
Foundation (not all wood)	Health, NonCancer (Tox. Units)	Incurred	7.9E-05	7.9E-05	7.9E-05
Foundation (not all wood)	Health, NonCancer (Tox. Units)	Displaced	2.1E-05	2.2E-05	2.0E-05
Foundation (not all wood)	Health, NonCancer (Tox. Units)	Net	1.0E-04	1.0E-04	9.9E-05
Foundation (not all wood)	Ozone depl. (g CFC-11 eq)	Incurred	0.02	0.02	0.02
Foundation (not all wood)	Ozone depl. (g CFC-11 eq)	Displaced	-0.07	-0.08	-0.05
Foundation (not all wood)	Ozone depl. (g CFC-11 eq)	Net	-0.04	-0.06	-0.02
Foundation (not all wood)	Eutroph. (kg N eq)	Incurred	0.04	0.04	0.04
Foundation (not all wood)	Eutroph. (kg N eq)	Displaced	-0.07	-0.08	-0.06

Foundation (not all wood)	Eutroph. (kg N eq)	Net	-0.02	-0.03	-0.01
Foundation (not all wood)	Acidification (kg SO2 eq)	Incurred	0.70	0.70	0.70
Foundation (not all wood)	Acidification (kg SO2 eq)	Displaced	-0.90	-1.08	-0.73
Foundation (not all wood)	Acidification (kg SO2 eq)	Net	-0.20	-0.38	-0.03
Foundation (not all wood)	Energy, Fossil (GJ)	Incurred	2.22	2.22	2.22
Foundation (not all wood)	Energy, Fossil (GJ)	Displaced	-9.19	-10.53	-7.92
Foundation (not all wood)	Energy, Fossil (GJ)	Net	-6.97	-8.31	-5.70

Data for Figure 4.6: Foam routes, processing one tonne of recovered foam (not including collection or primary recycling)

Impact Type	Incurred/ Displaced	result	result_lo	result_hi
GHG (kg CO2eq)	Incurred	6.11E+02	6.11E+02	6.11E+02
GHG (kg CO2eq)	Displaced	-2.54E+03	-4.06E+03	-1.02E+03
GHG (kg CO2eq)	Net	-1.93E+03	-3.45E+03	-4.04E+02
Water (m3; Blue)	Incurred	8.09E+00	8.09E+00	8.09E+00
Water (m3; Blue)	Displaced	-6.28E+01	-1.00E+02	-2.51E+01
Water (m3; Blue)	Net	-5.47E+01	-9.24E+01	-1.70E+01
Energy (MJ)	Incurred	1.22E+04	1.22E+04	1.22E+04
Energy (MJ)	Displaced	-5.23E+04	-8.36E+04	-2.09E+04
Energy (MJ)	Net	-4.01E+04	-7.15E+04	-8.75E+03
Smog (kg O3 eq)	Incurred	4.16E+01	4.16E+01	4.16E+01
Smog (kg O3 eq)	Displaced	-1.42E+02	-2.28E+02	-5.70E+01
Smog (kg O3 eq)	Net	-1.01E+02	-1.86E+02	-1.53E+01
PM2.5 eq (kg)	Incurred	5.12E-01	5.12E-01	5.12E-01
PM2.5 eq (kg)	Displaced	-1.48E+00	-2.37E+00	-5.93E-01
PM2.5 eq (kg)	Net	-9.71E-01	-1.86E+00	-8.12E-02
Health, Cancer (Tox. Units)	Incurred	6.51E-05	6.51E-05	6.51E-05

Health, Cancer (Tox. Units)	Displaced	-1.38E-04	-2.21E-04	-5.53E-05
Health, Cancer (Tox. Units)	Net	-7.32E-05	-1.56E-04	9.75E-06
Health, NonCancer (Tox. Units)	Incurred	8.66E-05	8.66E-05	8.66E-05
Health, NonCancer (Tox. Units)	Displaced	-1.25E-04	-2.00E-04	-4.99E-05
Health, NonCancer (Tox. Units)	Net	-3.82E-05	-1.13E-04	3.67E-05
Ozone depl. (kg CFC-11 eq)	Incurred	1.12E-04	1.12E-04	1.12E-04
Ozone depl. (kg CFC-11 eq)	Displaced	-3.40E-05	-5.44E-05	-1.36E-05
Ozone depl. (kg CFC-11 eq)	Net	7.78E-05	5.74E-05	9.82E-05
Eutroph. (kg N eq)	Incurred	9.98E-01	9.98E-01	9.98E-01
Eutroph. (kg N eq)	Displaced	-2.82E-01	-4.51E-01	-1.13E-01
Eutroph. (kg N eq)	Net	7.16E-01	5.47E-01	8.86E-01
Acidification (kg SO2 eq)	Incurred	2.74E+00	2.74E+00	2.74E+00
Acidification (kg SO2 eq)	Displaced	-1.12E+01	-1.79E+01	-4.47E+00
Acidification (kg SO2 eq)	Net	-8.43E+00	-1.51E+01	-1.73E+00
Energy, Fossil (MJ)	Incurred	1.10E+04	1.10E+04	1.10E+04
Energy, Fossil (MJ)	Displaced	-4.61E+04	-7.38E+04	-1.85E+04
Energy, Fossil (MJ)	Net	-3.51E+04	-6.28E+04	-7.42E+03
GHG (kg CO2eq)	Incurred	6.51E+03	5.90E+03	7.23E+03
GHG (kg CO2eq)	Displaced	-7.63E+03	-8.48E+03	-6.78E+03
GHG (kg CO2eq)	Net	-1.12E+03	-2.57E+03	4.48E+02
Water (m3; Blue)	Incurred	1.44E+02	1.29E+02	1.58E+02
Water (m3; Blue)	Displaced	-2.55E+02	-2.83E+02	-2.27E+02
Water (m3; Blue)	Net	-1.11E+02	-1.54E+02	-6.85E+01
Energy (MJ)	Incurred	1.25E+05	1.12E+05	1.37E+05
Energy (MJ)	Displaced	-1.84E+05	-2.04E+05	-1.63E+05
Energy (MJ)	Net	-5.89E+04	-9.18E+04	-2.59E+04
Smog (kg O3 eq)	Incurred	2.60E+02	2.34E+02	2.86E+02
Smog (kg O3 eq)	Displaced	-4.33E+02	-4.81E+02	-3.85E+02
Smog (kg O3 eq)	Net	-1.74E+02	-2.47E+02	-9.90E+01
PM2.5 eq (kg)	Incurred	3.41E+00	3.07E+00	3.76E+00
PM2.5 eq (kg)	Displaced	-5.19E+00	-5.77E+00	-4.62E+00

PM2.5 eq (kg)	Net	-1.78E+00	-2.70E+00	-8.58E-01
Health, Cancer (Tox. Units)	Incurred	3.26E-04	2.95E-04	3.57E-04
Health, Cancer (Tox. Units)	Displaced	-4.82E-04	-5.36E-04	-4.29E-04
Health, Cancer (Tox. Units)	Net	-1.56E-04	-2.41E-04	-7.21E-05
Health, NonCancer (Tox. Units)	Incurred	2.87E-04	2.59E-04	3.16E-04
Health, NonCancer (Tox. Units)	Displaced	-4.20E-04	-4.67E-04	-3.73E-04
Health, NonCancer (Tox. Units)	Net	-1.33E-04	-2.07E-04	-5.72E-05
Ozone depl. (kg CFC-11 eq)	Incurred	1.71E-04	1.58E-04	1.93E-04
Ozone depl. (kg CFC-11 eq)	Displaced	-7.86E-05	-8.74E-05	-6.99E-05
Ozone depl. (kg CFC-11 eq)	Net	9.24E-05	7.09E-05	1.23E-04
Eutroph. (kg N eq)	Incurred	1.10E+00	9.87E-01	1.21E+00
Eutroph. (kg N eq)	Displaced	-8.17E-01	-9.08E-01	-7.26E-01
Eutroph. (kg N eq)	Net	2.80E-01	7.91E-02	4.87E-01
Acidification (kg SO2 eq)	Incurred	2.04E+01	1.84E+01	2.25E+01
Acidification (kg SO2 eq)	Displaced	-3.13E+01	-3.48E+01	-2.78E+01
Acidification (kg SO2 eq)	Net	-1.10E+01	-1.65E+01	-5.38E+00
Energy, Fossil (MJ)	Incurred	1.11E+05	1.00E+05	1.23E+05
Energy, Fossil (MJ)	Displaced	-1.62E+05	-1.80E+05	-1.44E+05
Energy, Fossil (MJ)	Net	-5.09E+04	-8.01E+04	-2.15E+04
GHG (kg CO2eq)	Incurred	3.47E+03	2.63E+03	4.33E+03
GHG (kg CO2eq)	Displaced	-6.81E+03	-7.57E+03	-6.06E+03
GHG (kg CO2eq)	Net	-3.34E+03	-4.94E+03	-1.72E+03
Water (m3; Blue)	Incurred	4.56E+01	3.46E+01	5.70E+01
Water (m3; Blue)	Displaced	-2.28E+02	-2.53E+02	-2.02E+02
Water (m3; Blue)	Net	-1.82E+02	-2.18E+02	-1.45E+02
Energy (MJ)	Incurred	1.04E+05	7.90E+04	1.30E+05
Energy (MJ)	Displaced	-1.64E+05	-1.82E+05	-1.46E+05
Energy (MJ)	Net	-5.97E+04	-1.03E+05	-1.55E+04
Smog (kg O3 eq)	Incurred	1.78E+02	1.35E+02	2.22E+02
Smog (kg O3 eq)	Displaced	-3.87E+02	-4.30E+02	-3.44E+02
Smog (kg O3 eq)	Net	-2.09E+02	-2.95E+02	-1.22E+02

PM2.5 eq (kg)	Incurred	2.51E+00	1.90E+00	3.14E+00
PM2.5 eq (kg)	Displaced	-4.64E+00	-5.15E+00	-4.12E+00
PM2.5 eq (kg)	Net	-2.12E+00	-3.25E+00	-9.84E-01
Health, Cancer (Tox. Units)	Incurred	2.38E-04	1.84E-04	2.92E-04
Health, Cancer (Tox. Units)	Displaced	-4.31E-04	-4.78E-04	-3.83E-04
Health, Cancer (Tox. Units)	Net	-1.93E-04	-2.94E-04	-9.04E-05
Health, NonCancer (Tox. Units)	Incurred	1.96E-04	1.49E-04	2.43E-04
Health, NonCancer (Tox. Units)	Displaced	-3.75E-04	-4.17E-04	-3.33E-04
Health, NonCancer (Tox. Units)	Net	-1.79E-04	-2.67E-04	-8.99E-05
Ozone depl. (kg CFC-11 eq)	Incurred	8.22E-05	6.39E-05	1.01E-04
Ozone depl. (kg CFC-11 eq)	Displaced	-7.02E-05	-7.80E-05	-6.24E-05
Ozone depl. (kg CFC-11 eq)	Net	1.20E-05	-1.41E-05	3.86E-05
Eutroph. (kg N eq)	Incurred	3.72E-01	2.89E-01	4.56E-01
Eutroph. (kg N eq)	Displaced	-7.29E-01	-8.10E-01	-6.48E-01
Eutroph. (kg N eq)	Net	-3.58E-01	-5.21E-01	-1.92E-01
Acidification (kg SO2 eq)	Incurred	1.35E+01	1.02E+01	1.68E+01
Acidification (kg SO2 eq)	Displaced	-2.80E+01	-3.11E+01	-2.49E+01
Acidification (kg SO2 eq)	Net	-1.45E+01	-2.09E+01	-8.04E+00
Energy, Fossil (MJ)	Incurred	9.80E+04	7.42E+04	1.22E+05
Energy, Fossil (MJ)	Displaced	-1.45E+05	-1.61E+05	-1.29E+05
Energy, Fossil (MJ)	Net	-4.69E+04	-8.68E+04	-6.36E+03
GHG (kg CO2eq)	Incurred	1.78E+01	1.78E+01	1.78E+01
GHG (kg CO2eq)	Displaced	-1.08E+02	-1.20E+02	-9.62E+01
GHG (kg CO2eq)	Net	-9.04E+01	-1.02E+02	-7.84E+01
Water (m3; Blue)	Incurred	3.17E-02	3.17E-02	3.17E-02
Water (m3; Blue)	Displaced	-1.40E-01	-1.55E-01	-1.24E-01
Water (m3; Blue)	Net	-1.08E-01	-1.24E-01	-9.27E-02
Energy (MJ)	Incurred	3.22E+02	3.22E+02	3.22E+02
Energy (MJ)	Displaced	-1.77E+03	-1.97E+03	-1.58E+03
Energy (MJ)	Net	-1.45E+03	-1.65E+03	-1.25E+03
Smog (kg O3 eq)	Incurred	8.14E-01	8.14E-01	8.14E-01

Smog (kg O3 eq)	Displaced	-2.55E+01	-2.84E+01	-2.27E+01
Smog (kg O3 eq)	Net	-2.47E+01	-2.76E+01	-2.19E+01
PM2.5 eq (kg)	Incurred	1.02E-02	1.02E-02	1.02E-02
PM2.5 eq (kg)	Displaced	-1.04E-01	-1.16E-01	-9.26E-02
PM2.5 eq (kg)	Net	-9.40E-02	-1.06E-01	-8.25E-02
Health, Cancer (Tox. Units)	Incurred	8.96E-07	8.96E-07	8.96E-07
Health, Cancer (Tox. Units)	Displaced	-5.81E-06	-6.45E-06	-5.16E-06
Health, Cancer (Tox. Units)	Net	-4.91E-06	-5.56E-06	-4.27E-06
Health, NonCancer (Tox. Units)	Incurred	2.90E-06	2.90E-06	2.90E-06
Health, NonCancer (Tox. Units)	Displaced	-1.16E-05	-1.29E-05	-1.03E-05
Health, NonCancer (Tox. Units)	Net	-8.70E-06	-9.99E-06	-7.41E-06
Ozone depl. (kg CFC-11 eq)	Incurred	4.46E-06	4.46E-06	4.46E-06
Ozone depl. (kg CFC-11 eq)	Displaced	-2.53E-05	-2.82E-05	-2.25E-05
Ozone depl. (kg CFC-11 eq)	Net	-2.09E-05	-2.37E-05	-1.81E-05
Eutroph. (kg N eq)	Incurred	2.23E-03	2.23E-03	2.23E-03
Eutroph. (kg N eq)	Displaced	-5.06E-02	-5.63E-02	-4.50E-02
Eutroph. (kg N eq)	Net	-4.84E-02	-5.40E-02	-4.28E-02
Acidification (kg SO2 eq)	Incurred	4.99E-02	4.99E-02	4.99E-02
Acidification (kg SO2 eq)	Displaced	-1.41E+00	-1.56E+00	-1.25E+00
Acidification (kg SO2 eq)	Net	-1.36E+00	-1.51E+00	-1.20E+00
Energy, Fossil (MJ)	Incurred	3.16E+02	3.16E+02	3.16E+02
Energy, Fossil (MJ)	Displaced	-1.74E+03	-1.94E+03	-1.55E+03
Energy, Fossil (MJ)	Net	-1.43E+03	-1.62E+03	-1.24E+03
GHG (kg CO2eq)	Incurred	5.96E+02	5.96E+02	5.96E+02
GHG (kg CO2eq)	Displaced	-2.45E+02	-2.72E+02	-2.18E+02
GHG (kg CO2eq)	Net	3.51E+02	3.24E+02	3.79E+02
Water (m3; Blue)	Incurred	9.62E-01	9.62E-01	9.62E-01
Water (m3; Blue)	Displaced	-2.30E-01	-2.55E-01	-2.04E-01
Water (m3; Blue)	Net	7.33E-01	7.07E-01	7.58E-01
Energy (MJ)	Incurred	4.10E+03	4.10E+03	4.10E+03
Energy (MJ)	Displaced	-3.82E+04	-4.24E+04	-3.39E+04

Energy (MJ)	Net	-3.40E+04	-3.83E+04	-2.98E+04
Smog (kg O3 eq)	Incurred	1.04E+01	1.04E+01	1.04E+01
Smog (kg O3 eq)	Displaced	-2.91E+01	-3.23E+01	-2.59E+01
Smog (kg O3 eq)	Net	-1.87E+01	-2.19E+01	-1.54E+01
PM2.5 eq (kg)	Incurred	7.52E-02	7.52E-02	7.52E-02
PM2.5 eq (kg)	Displaced	-2.54E-01	-2.83E-01	-2.26E-01
PM2.5 eq (kg)	Net	-1.79E-01	-2.07E-01	-1.51E-01
Health, Cancer (Tox. Units)	Incurred	3.75E-06	3.75E-06	3.75E-06
Health, Cancer (Tox. Units)	Displaced	-1.59E-05	-1.77E-05	-1.42E-05
Health, Cancer (Tox. Units)	Net	-1.22E-05	-1.39E-05	-1.04E-05
Health, NonCancer (Tox. Units)	Incurred	2.37E-05	2.37E-05	2.37E-05
Health, NonCancer (Tox. Units)	Displaced	-1.83E-05	-2.03E-05	-1.62E-05
Health, NonCancer (Tox. Units)	Net	5.43E-06	3.40E-06	7.46E-06
Ozone depl. (kg CFC-11 eq)	Incurred	2.64E-05	2.64E-05	2.64E-05
Ozone depl. (kg CFC-11 eq)	Displaced	-6.25E-04	-6.95E-04	-5.56E-04
Ozone depl. (kg CFC-11 eq)	Net	-5.99E-04	-6.68E-04	-5.29E-04
Eutroph. (kg N eq)	Incurred	2.33E-02	2.33E-02	2.33E-02
Eutroph. (kg N eq)	Displaced	-1.38E-01	-1.54E-01	-1.23E-01
Eutroph. (kg N eq)	Net	-1.15E-01	-1.30E-01	-9.97E-02
Acidification (kg SO2 eq)	Incurred	6.20E-01	6.20E-01	6.20E-01
Acidification (kg SO2 eq)	Displaced	-2.59E+00	-2.88E+00	-2.31E+00
Acidification (kg SO2 eq)	Net	-1.97E+00	-2.26E+00	-1.69E+00
Energy, Fossil (MJ)	Incurred	3.91E+03	3.91E+03	3.91E+03
Energy, Fossil (MJ)	Displaced	-3.80E+04	-4.22E+04	-3.38E+04
Energy, Fossil (MJ)	Net	-3.41E+04	-3.83E+04	-2.99E+04
GHG (kg CO2eq)	Incurred	9.76E+03	8.92E+03	1.06E+04
GHG (kg CO2eq)	Displaced	-6.71E+03	-8.94E+03	-4.47E+03
GHG (kg CO2eq)	Net	3.05E+03	-2.00E+01	6.15E+03
Water (m3; Blue)	Incurred	1.10E+02	9.92E+01	1.22E+02
Water (m3; Blue)	Displaced	-1.14E+01	-1.53E+01	-7.63E+00
Water (m3; Blue)	Net	9.88E+01	8.39E+01	1.14E+02

Energy (MJ)	Incurred	2.10E+05	1.84E+05	2.36E+05
Energy (MJ)	Displaced	-3.29E+04	-4.39E+04	-2.20E+04
Energy (MJ)	Net	1.77E+05	1.40E+05	2.14E+05
Smog (kg O3 eq)	Incurred	4.23E+02	3.80E+02	4.67E+02
Smog (kg O3 eq)	Displaced	-2.58E+02	-3.44E+02	-1.72E+02
Smog (kg O3 eq)	Net	1.65E+02	3.58E+01	2.95E+02
PM2.5 eq (kg)	Incurred	4.30E+00	3.69E+00	4.93E+00
PM2.5 eq (kg)	Displaced	-1.83E+00	-2.44E+00	-1.22E+00
PM2.5 eq (kg)	Net	2.47E+00	1.26E+00	3.71E+00
Health, Cancer (Tox. Units)	Incurred	3.68E-04	3.14E-04	4.22E-04
Health, Cancer (Tox. Units)	Displaced	-1.44E-04	-1.93E-04	-9.63E-05
Health, Cancer (Tox. Units)	Net	2.23E-04	1.22E-04	3.26E-04
Health, NonCancer (Tox. Units)	Incurred	2.94E-04	2.48E-04	3.42E-04
Health, NonCancer (Tox. Units)	Displaced	-3.49E-04	-4.66E-04	-2.33E-04
Health, NonCancer (Tox. Units)	Net	-5.50E-05	-2.18E-04	1.09E-04
Ozone depl. (kg CFC-11 eq)	Incurred	3.21E-04	3.02E-04	3.40E-04
Ozone depl. (kg CFC-11 eq)	Displaced	-2.54E-04	-3.39E-04	-1.69E-04
Ozone depl. (kg CFC-11 eq)	Net	6.66E-05	-3.65E-05	1.70E-04
Eutroph. (kg N eq)	Incurred	8.82E-01	7.99E-01	9.66E-01
Eutroph. (kg N eq)	Displaced	-5.42E-01	-7.23E-01	-3.61E-01
Eutroph. (kg N eq)	Net	3.40E-01	7.63E-02	6.05E-01
Acidification (kg SO2 eq)	Incurred	3.54E+01	3.22E+01	3.88E+01
Acidification (kg SO2 eq)	Displaced	-1.30E+01	-1.73E+01	-8.66E+00
Acidification (kg SO2 eq)	Net	2.25E+01	1.49E+01	3.01E+01
Energy, Fossil (MJ)	Incurred	1.96E+05	1.72E+05	2.20E+05
Energy, Fossil (MJ)	Displaced	-2.97E+04	-3.96E+04	-1.98E+04
Energy, Fossil (MJ)	Net	1.66E+05	1.32E+05	2.00E+05

Data for Figure 4.7: Wood routes, processing one tonne of recovered wood (not including collection or primary recycling)

Scenario	Impact Type	Incurred/ Displaced	result	result_lo	result_hi
Mulch	GHG (kg CO2eq)	Incurred	1.26E+01	1.26E+01	1.26E+01
Mulch	GHG (kg CO2eq)	Displaced	-1.26E+02	-1.40E+02	-1.12E+02
Mulch	GHG (kg CO2eq)	Net	-1.13E+02	-1.27E+02	-9.90E+01
Mulch	Water (m3; Blue)	Incurred	9.41E-02	9.41E-02	9.41E-02
Mulch	Water (m3; Blue)	Displaced	-2.48E-01	-2.76E-01	-2.21E-01
Mulch	Water (m3; Blue)	Net	-1.54E-01	-1.82E-01	-1.26E-01
Mulch	Energy (MJ)	Incurred	2.37E+02	2.37E+02	2.37E+02
Mulch	Energy (MJ)	Displaced	-3.46E+04	-3.85E+04	-3.08E+04
Mulch	Energy (MJ)	Net	-3.44E+04	-3.83E+04	-3.06E+04
Mulch	Smog (kg O3 eq)	Incurred	4.40E-01	4.40E-01	4.40E-01
Mulch	Smog (kg O3 eq)	Displaced	-9.29E+00	-1.03E+01	-8.26E+00
Mulch	Smog (kg O3 eq)	Net	-8.85E+00	-9.88E+00	-7.82E+00
Mulch	PM2.5 eq (kg)	Incurred	3.26E-02	3.26E-02	3.26E-02
Mulch	PM2.5 eq (kg)	Displaced	-7.04E-02	-7.82E-02	-6.26E-02
Mulch	PM2.5 eq (kg)	Net	-3.78E-02	-4.56E-02	-3.00E-02
Mulch	Health, Cancer (Tox. Units)	Incurred	1.56E-06	1.56E-06	1.56E-06
Mulch	Health, Cancer (Tox. Units)	Displaced	-8.10E-06	-9.00E-06	-7.20E-06
Mulch	Health, Cancer (Tox. Units)	Net	-6.54E-06	-7.44E-06	-5.64E-06
Mulch	Health, NonCancer (Tox. Units)	Incurred	8.10E-07	8.10E-07	8.10E-07
Mulch	Health, NonCancer (Tox. Units)	Displaced	-1.63E-05	-1.81E-05	-1.45E-05
Mulch	Health, NonCancer (Tox. Units)	Net	-1.55E-05	-1.73E-05	-1.37E-05
Mulch	Ozone depl. (kg CFC-11 eq)	Incurred	1.01E-06	1.01E-06	1.01E-06
Mulch	Ozone depl. (kg CFC-11 eq)	Displaced	-3.01E-05	-3.34E-05	-2.67E-05
Mulch	Ozone depl. (kg CFC-11 eq)	Net	-2.91E-05	-3.24E-05	-2.57E-05
Mulch	Eutroph. (kg N eq)	Incurred	1.01E-03	1.01E-03	1.01E-03
Mulch	Eutroph. (kg N eq)	Displaced	-2.17E-02	-2.41E-02	-1.93E-02
Mulch	Eutroph. (kg N eq)	Net	-2.07E-02	-2.31E-02	-1.83E-02

Mulch	Acidification (kg SO2 eq)	Incurred	2.95E-02	2.95E-02	2.95E-02
Mulch	Acidification (kg SO2 eq)	Displaced	-4.46E-01	-4.95E-01	-3.96E-01
Mulch	Acidification (kg SO2 eq)	Net	-4.16E-01	-4.66E-01	-3.67E-01
Mulch	Energy, Fossil (MJ)	Incurred	1.74E+02	1.74E+02	1.74E+02
Mulch	Energy, Fossil (MJ)	Displaced	-2.14E+03	-2.38E+03	-1.90E+03
Mulch	Energy, Fossil (MJ)	Net	-1.97E+03	-2.21E+03	-1.73E+03
Reuse	GHG (kg CO2eq)	Incurred	1.53E+02	1.53E+02	1.53E+02
Reuse	GHG (kg CO2eq)	Displaced	-1.53E+02	-2.04E+02	-1.02E+02
Reuse	GHG (kg CO2eq)	Net	5.30E-02	-5.10E+01	5.12E+01
Reuse	Water (m3; Blue)	Incurred	1.55E+00	1.55E+00	1.55E+00
Reuse	Water (m3; Blue)	Displaced	-5.20E-01	-6.94E-01	-3.47E-01
Reuse	Water (m3; Blue)	Net	1.02E+00	8.51E-01	1.20E+00
Reuse	Energy (MJ)	Incurred	2.94E+03	2.94E+03	2.94E+03
Reuse	Energy (MJ)	Displaced	-4.50E+04	-6.00E+04	-3.00E+04
Reuse	Energy (MJ)	Net	-4.21E+04	-5.71E+04	-2.71E+04
Reuse	Smog (kg O3 eq)	Incurred	6.16E+00	6.16E+00	6.16E+00
Reuse	Smog (kg O3 eq)	Displaced	-1.59E+01	-2.12E+01	-1.06E+01
Reuse	Smog (kg O3 eq)	Net	-9.75E+00	-1.51E+01	-4.45E+00
Reuse	PM2.5 eq (kg)	Incurred	1.03E-01	1.03E-01	1.03E-01
Reuse	PM2.5 eq (kg)	Displaced	-2.69E-01	-3.59E-01	-1.80E-01
Reuse	PM2.5 eq (kg)	Net	-1.66E-01	-2.56E-01	-7.61E-02
Reuse	Health, Cancer (Tox. Units)	Incurred	6.44E-06	6.44E-06	6.44E-06
Reuse	Health, Cancer (Tox. Units)	Displaced	-1.50E-05	-2.00E-05	-1.00E-05
Reuse	Health, Cancer (Tox. Units)	Net	-8.56E-06	-1.36E-05	-3.56E-06
Reuse	Health, NonCancer (Tox. Units)	Incurred	8.74E-06	8.74E-06	8.74E-06
Reuse	Health, NonCancer (Tox. Units)	Displaced	-3.08E-05	-4.11E-05	-2.05E-05
Reuse	Health, NonCancer (Tox. Units)	Net	-2.21E-05	-3.23E-05	-1.18E-05
Reuse	Ozone depl. (kg CFC-11 eq)	Incurred	1.39E-05	1.39E-05	1.39E-05
Reuse	Ozone depl. (kg CFC-11 eq)	Displaced	-2.57E-05	-3.43E-05	-1.71E-05
Reuse	Ozone depl. (kg CFC-11 eq)	Net	-1.18E-05	-2.04E-05	-3.22E-06
Reuse	Eutroph. (kg N eq)	Incurred	4.20E-02	4.20E-02	4.20E-02

Reuse	Eutroph. (kg N eq)	Displaced	-3.36E-02	-4.48E-02	-2.24E-02
Reuse	Eutroph. (kg N eq)	Net	8.40E-03	-2.79E-03	1.96E-02
Reuse	Acidification (kg SO2 eq)	Incurred	4.52E-01	4.52E-01	4.52E-01
Reuse	Acidification (kg SO2 eq)	Displaced	-7.49E-01	-9.99E-01	-5.00E-01
Reuse	Acidification (kg SO2 eq)	Net	-2.98E-01	-5.48E-01	-4.80E-02
Reuse	Energy, Fossil (MJ)	Incurred	2.50E+03	2.50E+03	2.50E+03
Reuse	Energy, Fossil (MJ)	Displaced	-2.41E+03	-3.22E+03	-1.61E+03
Reuse	Energy, Fossil (MJ)	Net	8.54E+01	-7.20E+02	8.90E+02
BioEnergy	GHG (kg CO2eq)	Incurred	7.88E+01	7.88E+01	7.88E+01
BioEnergy	GHG (kg CO2eq)	Displaced	-6.52E+02	-7.24E+02	-5.79E+02
BioEnergy	GHG (kg CO2eq)	Net	-5.73E+02	-6.45E+02	-5.01E+02
BioEnergy	Water (m3; Blue)	Incurred	5.05E-01	5.05E-01	5.05E-01
BioEnergy	Water (m3; Blue)	Displaced	-1.32E-01	-1.47E-01	-1.18E-01
BioEnergy	Water (m3; Blue)	Net	3.73E-01	3.58E-01	3.87E-01
BioEnergy	Energy (MJ)	Incurred	1.08E+03	1.08E+03	1.08E+03
BioEnergy	Energy (MJ)	Displaced	-1.17E+04	-1.30E+04	-1.04E+04
BioEnergy	Energy (MJ)	Net	-1.06E+04	-1.19E+04	-9.28E+03
BioEnergy	Smog (kg O3 eq)	Incurred	6.35E+01	6.35E+01	6.35E+01
BioEnergy	Smog (kg O3 eq)	Displaced	-8.17E+00	-9.07E+00	-7.26E+00
BioEnergy	Smog (kg O3 eq)	Net	5.53E+01	5.44E+01	5.63E+01
BioEnergy	PM2.5 eq (kg)	Incurred	6.14E-01	6.14E-01	6.14E-01
BioEnergy	PM2.5 eq (kg)	Displaced	-5.21E-02	-5.79E-02	-4.63E-02
BioEnergy	PM2.5 eq (kg)	Net	5.62E-01	5.56E-01	5.68E-01
BioEnergy	Health, Cancer (Tox. Units)	Incurred	1.11E-05	1.11E-05	1.11E-05
BioEnergy	Health, Cancer (Tox. Units)	Displaced	-5.53E-06	-6.14E-06	-4.91E-06
BioEnergy	Health, Cancer (Tox. Units)	Net	5.61E-06	5.00E-06	6.23E-06
BioEnergy	Health, NonCancer (Tox. Units)	Incurred	3.89E-04	3.89E-04	3.89E-04
BioEnergy	Health, NonCancer (Tox. Units)	Displaced	-7.61E-06	-8.46E-06	-6.77E-06
BioEnergy	Health, NonCancer (Tox. Units)	Net	3.81E-04	3.80E-04	3.82E-04
BioEnergy	Ozone depl. (kg CFC-11 eq)	Incurred	2.57E-06	2.57E-06	2.57E-06
BioEnergy	Ozone depl. (kg CFC-11 eq)	Displaced	-7.09E-05	-7.88E-05	-6.31E-05

BioEnergy	Ozone depl. (kg CFC-11 eq)	Net	-6.84E-05	-7.63E-05	-6.05E-05
BioEnergy	Eutroph. (kg N eq)	Incurred	1.24E-01	1.24E-01	1.24E-01
BioEnergy	Eutroph. (kg N eq)	Displaced	-2.63E-02	-2.92E-02	-2.34E-02
BioEnergy	Eutroph. (kg N eq)	Net	9.79E-02	9.50E-02	1.01E-01
BioEnergy	Acidification (kg SO2 eq)	Incurred	2.09E+00	2.09E+00	2.09E+00
BioEnergy	Acidification (kg SO2 eq)	Displaced	-6.06E-01	-6.74E-01	-5.39E-01
BioEnergy	Acidification (kg SO2 eq)	Net	1.48E+00	1.41E+00	1.55E+00
BioEnergy	Energy, Fossil (MJ)	Incurred	8.83E+02	8.83E+02	8.83E+02
BioEnergy	Energy, Fossil (MJ)	Displaced	-1.16E+04	-1.29E+04	-1.03E+04
BioEnergy	Energy, Fossil (MJ)	Net	-1.07E+04	-1.20E+04	-9.44E+03
Landfill	GHG (kg CO2eq)	Incurred	5.32E+01	5.32E+01	5.32E+01
Landfill	GHG (kg CO2eq)	Net	5.32E+01	5.32E+01	5.32E+01
Landfill	Water (m3; Blue)	Incurred	2.64E-01	2.64E-01	2.64E-01
Landfill	Water (m3; Blue)	Net	2.64E-01	2.64E-01	2.64E-01
Landfill	Energy (MJ)	Incurred	3.19E+02	3.19E+02	3.19E+02
Landfill	Energy (MJ)	Net	3.19E+02	3.19E+02	3.19E+02
Landfill	Smog (kg O3 eq)	Incurred	2.07E+00	2.07E+00	2.07E+00
Landfill	Smog (kg O3 eq)	Net	2.07E+00	2.07E+00	2.07E+00
Landfill	PM2.5 eq (kg)	Incurred	1.33E-02	1.33E-02	1.33E-02
Landfill	PM2.5 eq (kg)	Net	1.33E-02	1.33E-02	1.33E-02
Landfill	Health, Cancer (Tox. Units)	Incurred	1.29E-06	1.29E-06	1.29E-06
Landfill	Health, Cancer (Tox. Units)	Net	1.29E-06	1.29E-06	1.29E-06
Landfill	Health, NonCancer (Tox. Units)	Incurred	9.00E-06	9.00E-06	9.00E-06
Landfill	Health, NonCancer (Tox. Units)	Net	9.00E-06	9.00E-06	9.00E-06
Landfill	Ozone depl. (kg CFC-11 eq)	Incurred	3.94E-06	3.94E-06	3.94E-06
Landfill	Ozone depl. (kg CFC-11 eq)	Net	3.94E-06	3.94E-06	3.94E-06
Landfill	Eutroph. (kg N eq)	Incurred	4.33E-03	4.33E-03	4.33E-03
Landfill	Eutroph. (kg N eq)	Net	4.33E-03	4.33E-03	4.33E-03
Landfill	Acidification (kg SO2 eq)	Incurred	8.72E-02	8.72E-02	8.72E-02
Landfill	Acidification (kg SO2 eq)	Net	8.72E-02	8.72E-02	8.72E-02
Landfill	Energy, Fossil (MJ)	Incurred	3.09E+02	3.09E+02	3.09E+02

Landfill	Energy, Fossil (MJ)	Net	3.09E+02	3.09E+02	3.09E+02