AUSTRALASIA EPD®

ENVIRONMENTAL PRODUCT DECLARATION

Environmental Product Declaration for Tork® Hand Towels and Handee Paper Towels

Produced under EPD Australasia in accordance with ISO 14025. EPD registration number: S-P-00851.

Version 2.0 of 30/09/2019. Approved 30/09/2019. Valid until 30/09/2022. Reference year: 2018 calendar year.

Geographical scope: Australia and New Zealand.

Asaleo Care

Asaleo Care is a leader in Personal Care and Hygiene across Australasia, offering products that provide care, comfort and confidence every day.

The Company manufactures, markets, distributes and sells essential, everyday consumer products including tampons, pads and liners, nappies, toilet and facial tissue, paper towels, napkis and disposable tableware. Our popular products are recognised household brands like Libra, TENA, Sorbent and Purex, Handee Ultra, Treasures, Deeko, Viti and Orchid.

Our professional hygiene products, which include hand towels, napkins, toilet and facial tissue, soaps and other hygiene accessories, are sold under the Tork brand to the hospitality sector, offices, schools, hospitals, shopping centres and industrial companies. Our TENA Incontinence Healthcare products and support services are provided to healthcare professionals in residential and community care facilities, retirement villages and hospitals.

Asaleo Care has 15 manufacturing and distribution facilities across Australia, New Zealand and the Pacific Islands. For more information, visit www.asaleocare.com

Brands in this Environmental Product Declaration

Tork is the leading global brand in professional hygiene. From toilet tissue in universities to sports stadiums and hospitals, Tork delivers a great experience for the user and a convenient experience for the buyer. Tork is dedicated to serving your needs in a sustainable way – saving you time, money and effort, so you can focus on what matters most to your business.

To learn more about Tork, please visit www.tork.co.nz or www.tork.com.au. Tork is a registered trademark of Essity, licensed exclusively to Asaleo Care for use in Australia, New Zealand and a number of other countries in the Pacific region.

In the late 1960s our Kawerau factory was making paper towels for hospitals when it was recognised that there was a need for a similar product in the home and Handee paper towel was born. Since production in the early 1970s it has become a household name and is market leader in grocery. Handee Ultra, made to cope with anything you can throw at it!

Sustainability – a core part of how we do business

Sustainability is built into Tork and Handee paper towel products from the start:

We begin with 100% responsibly-sourced, non-controversial pulp. In particular, we are committed to purchase pulp and paper reels consistent with No Deforestation, No Peat, No Exploitation (NDPE) policies adopted by the forestry and palm oil industries. Our pulp is sourced from socially and environmentally sustainable forests in line with Forest Stewardship Council® (FSC®) standards, helping protect forests for present and future generations. The pulp that enters our Kawerau paper machines is from 100% FSC certified sources, with a maximum of 30% FSC Controlled Wood sources.

We then manufacture paper locally, using a large share of renewable energy. We are proud to manufacture the products in this Environmental Product Declaration in Kawerau, New Zealand. Our Kawerau operation is certified to ISO 9001, ISO 14001, AS/NZS 4801 and FSC chain of custody. In 2010, we replaced most of our natural gas consumption with geothermal steam in an ongoing partnership with Ngāti Tūwharetoa Geothermal Assets. In addition, our site's electricity comes from the New Zealand grid, comprising 84% renewable energy in 2018 (MBIE 2018). Consequently, since 2009 we have more than halved the greenhouse gas emissions generated from our Kawerau plant.

We help our customers to reduce their environmental footprint through their use of our unique consumption-reducing dispensers and recyclable packaging, both of which help to reduce waste. Our upgrade from bulky cardboard cartons with the Tork Carry Pack led to a six-fold reduction in packaging waste and six times less packaging to transport.

We focus on continuous improvement at Kawerau and in the past decade we have reduced water consumption by over 30%, reduced waste to landfill by a third and almost doubled our waste recycling rate.

This EPD helps to demonstrate Asaleo Care's commitment to sustainability and complements our work with eco-label and sustainability organisations such as FSC, Environmental Choice New Zealand, Sedex and the Dow Jones Sustainability Index.

Asaleo Care Paper Mill
Kawerau, New Zealand

Environmental Product Declaration (EPD)

An Environmental Product Declaration, or EPD, is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules known as a PCR (Product Category Rules). Environmental Product Declarations within the same product category from different EPD programmes may not be comparable.

Products covered by this EPD

All products in this EPD are covered by the following industry classifications: ANZSIC v1.0 C152400 “Sanitary Paper Product Manufacturing” and UN CPC v2 32131 “Toilet or facial tissue stock, towel or napkin stock and similar paper, cellulose wadding and webs of cellulose fibres”.

The **Tork Xpress Multifold Hand Towel** is the most popular format in the Tork range based on its unrivalled value. The **Tork Ultraslim Multifold Hand Towel** offers similar benefits in an even slimmer dispenser. These soft and absorbent towels are packed in the innovative Tork Carry Packs that make it easier to carry, use and dispose. Available in a wide range of quality, tailored for specific needs (Premium, Advanced and Universal).

Tork Xpress® Multifold Hand Towel / Slimline H2 Advanced

- Single ply, white tissue paper
- FSC Mix 70% certified
- Unfolded sheet dimensions: 21.0 cm wide x 24.0 cm long
- Folded sheet dimensions: 21.0 cm wide x 8.0 cm long
- Net weight per pack of 185 sheets: 425 g
- Tork Carry Packs™ lightweight plastic packaging
- Article: 148430

Tork Xpress® Multifold Hand Towel / Slimline H2 Universal

- Single ply, white tissue paper
- FSC Mix 70% certified
- Unfolded sheet dimensions: 21.0 cm wide x 24.0 cm long
- Folded sheet dimensions: 21.0 cm wide x 8.0 cm long
- Net weight per pack of 230 sheets: 485 g
- Tork Carry Packs™ lightweight plastic packaging
- Article: 184987

Tork Ultraslim Multifold Hand Towel / H4 Advanced

- Single ply, white tissue paper
- FSC Mix 70% certified
- Unfolded sheet dimensions: 21.0 cm wide x 24.0 cm long
- Folded sheet dimensions: 21.0 cm wide x 6.0 cm long
- Net weight per pack of 150 sheets: 345 g
- Tork Carry Packs™ lightweight plastic packaging
- Article: 170370

Tork Basic Paper, **Tork Roll Towel** and **Tork Ultra Long Kitchen Towel** are designed for basic wiping tasks such as mopping up spills, soaking up liquids and picking up dust and dirt with paper.

Tork Basic Paper 1ply Centerfeed Roll M2

- Single ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 20.0 cm wide x 300.0 m long
- Net weight: 1350 g
- Article: 120155

Tork Roll Towel Universal

- Single ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 18.0 cm wide x 90.0 m long
- Net weight: 600 g
- Article: 2187951

Tork Ultra Long Kitchen Towel

- Two ply, white tissue paper
- FSC Mix 70% certified
- Sheet dimensions: 28.0 cm wide x 40.0 cm long
- Net weight per pack of 2 x 156 sheets: 960 g
- Article: 2327073 (available in NZ only)

Handee paper towels are designed for home use and come in a range of formats:

Handee standard-length roll (available as 2s, 3s, 4s and 6s)

- Two-ply, white or printed tissue paper
- FSC Mix 70% certified
- Dimensions: 27cm x 13.5m long (60 sheets)
- Net weight per roll: 195 g
- Article numbers: 2169509 White 2s, 0000483 Print 2s, 2297220 Summer Festive 2s, 2297191 White 3s, 2323054 White 4s, 2324454 White 6s

Handee long roll (2-pack)

- Two-ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 27cm x 20.3m long (90 sheets)
- Net weight per roll: 292 g
- Article: 2312551

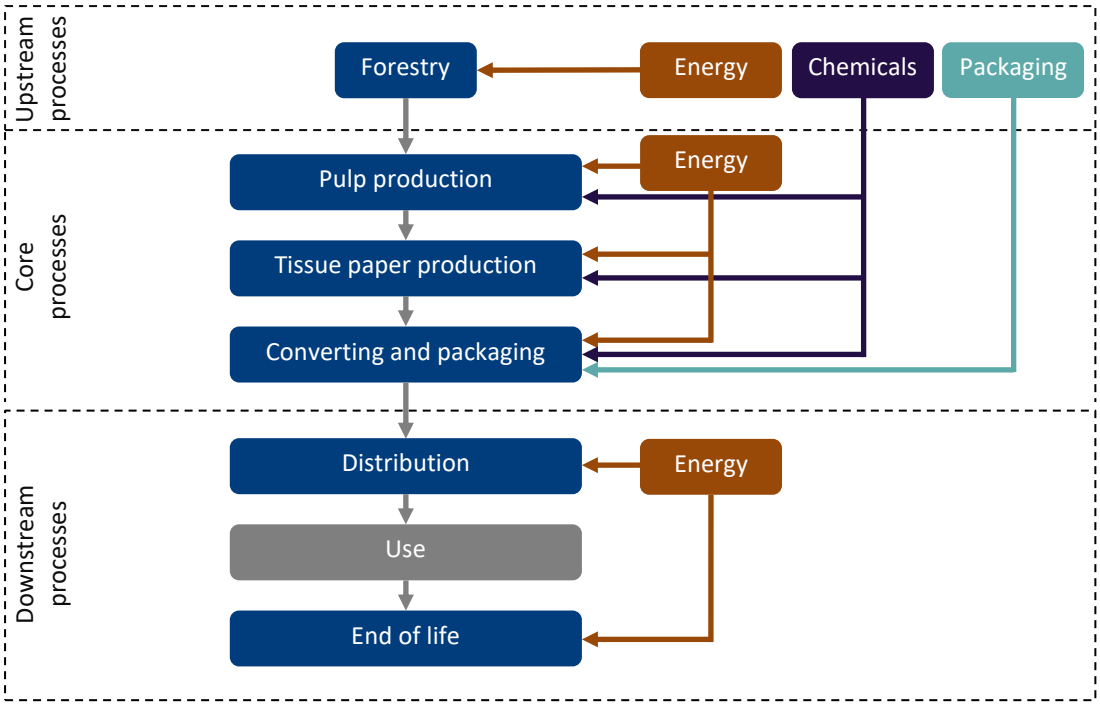
Handee double-length roll (2-pack)

- Two-ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 27cm x 27m long (120 sheets)
- Net weight per roll: 390 g
- Article: 2329558

Handee MAX (2-pack)

- Three-ply, white tissue paper
- FSC Mix 70% certified
- Dimensions: 27cm x 13.5m long (60 sheets)
- Net weight per roll: 259 g
- Article: 2325522

Life cycle of Tork® and Handee paper products



This EPD covers the full life cycle of paper towel products from cradle-to-grave.

The life cycle starts with (1) forestry to grow wood fibre, (2) production of the chemicals needed to make paper from wood fibre, (3) production of packaging materials, and (4) production of energy for these process steps. These are the **upstream processes**.

Wood chips/residues, chemicals and fuels are transported to pulp mills, where wood pulp is made from wood fibre. This pulp is then transported to Asaleo Care's paper mill where it is formed into paper, cut to size ('converted'), packaged and then warehoused. These steps also require energy to be produced, and for both solid waste and wastewater to be treated. These are the **core processes**.

Finally, finished paper towel products are transported to customers. As the use of a paper towel has no direct environmental impacts, use is not included in this EPD. The final step is end-of-life, where the paper towel and its packaging are disposed. These are the **downstream processes**.

Key parameters and assumptions for the LCA

- **Functional unit:** 1 tonne (1000 kg) of tissue paper as delivered, plus packaging.
- **Manufacturing site:** All products are manufactured in Kawerau, New Zealand.
- **Distribution to customer:** Distribution from the manufacturing plant to customer via Asaleo Care's warehouses is based on a sales-weighted average of the distances travelled in each transport mode (truck and container ship).
- **End of life:** Two options are provided for product end-of-life: landfill and composting. Results are declared separately for each option in the results tables that follow.

  100% of polyethylene film packaging is assumed to go to landfill (conservative approach). 71% of paper packaging is assumed to be recovered for recycling, with the remainder landfilled (APCO 2019). Recovery and recycling rates in New Zealand are likely to be similar but are not available due to uncertainties in waste statistics (PCNZ 2015). No credits are applied for recycling paper in line with the PCR (IEPDS 2015).

  All waste treatment assumes truck transport of 50 km outbound with an empty backhaul.
- **Biogenic carbon emissions from landfill:** From every kilogram of paper, 22% of the mass is biogenic carbon that is converted to landfill gas. From every kilogram of carbon converted to landfill gas, 71.2% is released as carbon dioxide and 28.8% is released as methane. These percentages represent Australian conditions where data quality is best.
  - 0.45 kg/kg = degradable organic carbon in paper at 10% water content (ECN 2012)
  - 0.49 kg/kg = fraction of carbon that degrades (Australian Government 2018)
  - Of the landfill gas formed, 50% is CO_2 and 50% is CH_4 (ibid)
  - 36% of the CH_4 is captured, of which 75% is used for energy recovery and 25% is flared (Carre 2011, based on Hyder Consulting 2007)
  - 64% of the CH_4 is not captured, of which 90% is released to the atmosphere as CH_4 and 10% is oxidised to CO_2 in the landfill's surface (Australian Government 2018)
- **Biogenic carbon emissions from composting:** Windrow composting is assumed using operational inputs from UNSW (2003). 92% of cellulose (Venelampi et al. 2003) and 23% of lignin (Tuomela et al. 2000) is assumed to break down, with 9 kg methane released per tonne of paper (IPCC 2006) and the remainder as carbon dioxide.
- **Data for core processes:** Primary (specific) data were collected from Asaleo Care and our pulp suppliers as per the PCR (IEPDS 2015). Data are an annual average for the 2018 calendar year. Mono-nitrogen oxides (NOx) have been modelled as nitrogen dioxide (NO_2) and Total Reduced Sulfur (TRS) has been modelled as hydrogen sulfide (H_2S).
- **Data for upstream and downstream processes:** Secondary (generic) data were used for forestry, chemical production, packaging materials and electricity, as allowed under the PCR (IEPDS 2015). All data are from the GaBi Life Cycle Inventory Database 2019 and are typically representative of the years 2015 to 2018, depending on the dataset (thinkstep 2016).
- **Electricity mixes:** All electricity is based on national averages for 2016 from the GaBi Life Cycle Inventory Database 2019 (thinkstep 2019).
- **Allocation:** Where required, co-product allocation using the most relevant physical quantity (mass, energy or exergy) was applied for core processes. Allocation rules for secondary data (upstream/downstream processes) are documented on the GaBi website (thinkstep 2019). Recycling allocation follows the polluter pays principle in line with IEPDS (2017).
- **Cut-off criteria:** Environmental impacts relating to personnel, infrastructure, and production equipment not directly consumed in the process are excluded from the system boundary as per the PCR (IEPDS 2015). All other reported data were incorporated and modelled using the best available life cycle inventory data.

Environmental indicators

Indicator	Description
Global Warming Potential (GWP)	Also known as carbon footprint, GWP is the potential of greenhouse gases – such as carbon dioxide and methane – to increase absorption of heat reaching Earth's atmosphere, intensifying the natural greenhouse effect. Net emissions from fossil and biogenic sources are reported separately within this EPD. Biogenic GWP includes the removal of carbon dioxide from the atmosphere as trees grow and the release of this carbon at end-of-life.
Acidification Potential (AP)	The potential of emissions to cause acidifying effects in the environment, typically due to acid rain. Potential downstream effects include fish mortality, forest decline and the deterioration of building materials.
Eutrophication Potential (EP)	The potential of emissions – such as nitrogen (N) and phosphorus (P) – to contribute to excessively high nutrient levels in both aquatic and terrestrial ecosystems, which can cause undesirable shifts in species composition and elevated biomass production (e.g. algal blooms).
Photochemical Ozone Creation Potential (POCP)	A measure of emissions of precursors that contribute to ground-level smog formation (mainly ozone, O_3). Ground-level ozone can be harmful to human and ecosystem health and can also damage crops.
Water	Consumption (net use) of water from lakes, rivers and groundwater. Consumption of rainwater in forests is not included in this EPD as there is currently no widely accepted method for determining a baseline water use case for forests against which consumption could be measured.
Primary Energy Demand (PED)	A measure of the total amount of primary energy extracted from the earth. PED is expressed in energy demand from non-renewable resources (e.g. petroleum, natural gas, etc.) and energy demand from renewable resources (e.g. biomass, hydropower, wind energy, etc.). Efficiencies in energy conversion (e.g. power, heat, steam, etc.) are taken into account.

Tork Xpress® Multifold Hand Towel / Slimline H2 Advanced

Article(s): 148430

1,000 kg air-dry tissue + 13 kg paper packaging + 14 kg plastic packaging = 1,027 kg total.
Paper >97% virgin CTMP pulp. Bleaching agent: hydrogen peroxide (totally chlorine free).

Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
GWP (global warming), fossil	kg CO_2e	331	1,200	1,530	115	1,650	78.2	1,610	-2%
GWP (global warming), biogenic	kg CO_2e	-1,990	322	-1,670	2,930	1,260	1,530	-143	-111%
GWP (global warming), total	kg CO_2e	-1,660	1,520	-140	3,050	2,910	1,610	1,470	-49%
AP (acidification)	kg SO_2e	1.85	11.2	13.1	1.49	14.6	1.13	14.2	-3%
EP (eutrophication)	kg PO_4^{3-}e	0.280	1.36	1.64	0.502	2.15	0.157	1.80	-16%
POCP (photochemical ozone)	kg C_2H_4e	0.191	0.299	0.490	0.546	1.04	0.0746	0.565	-46%

Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
PED (energy), renewable	MJ	21,700	21,300	43,000	71.7	43,000	9.38	43,000	0%
PED (energy), non-renewable	MJ	5,980	17,500	23,500	1,570	25,000	943	24,400	-2%
PED (energy), total	MJ	27,600	38,800	66,500	1,640	68,100	952	67,400	-1%
PED (energy), % renewable	%	78.4%	54.9%	64.7%	4.4%	63.2%	1.0%	63.8%	

Waste

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste	kg	8.10E-06	9.49E-06	1.76E-05	1.59E-06	1.92E-05	1.35E-07	1.77E-05	-8%
Non-hazardous waste	kg	4.12	28.0	32.2	228	260	13.9	46.1	-82%

Tork Xpress® Multifold Hand Towel / Slimline H2 Advanced cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**174**	**724**	**898**	**191**	**1,090**	**4.55**	**903**	**-17%**
	Inert rock	kg	121	597	718	0.443	719	0.615	719	0%
	Calcium carbonate	kg	13.5	8.08	21.6	2.05	23.7	0.0682	21.7	-8%
	Natural aggregate	kg	4.37	66.9	71.2	61.2	132	1.26	72.5	-45%
	Soil	kg	-10.3	39.3	28.9	26.0	55.0	0.553	29.5	-46%
	Quartz sand	kg	0.285	0.992	1.28	35.6	36.9	0.716	1.99	-95%
	Sodium chloride	kg	27.8	3.14	30.9	0.357	31.3	0.00764	30.9	-1%
	Other	kg	17.5	8.35	25.8	65.4	91.2	1.34	27.2	-70%
Energy	**Total**	**kg**	**156**	**451**	**608**	**40.6**	**648**	**22.6**	**630**	**-3%**
	Natural gas	kg	39.9	195	235	11.1	246	1.17	236	-4%
	Crude oil	kg	41.5	59.4	101	21.6	122	20.7	121	-1%
	Hard coal	kg	44.7	39.3	83.9	2.69	86.6	0.350	84.3	-3%
	Lignite	kg	13.4	95.7	109	4.53	114	0.410	109	-4%
	Shale gas	kg	9.22	9.26	18.5	0.00103	18.5	6.92E-04	18.5	0%
	Tight gas	kg	3.97	38.4	42.3	9.24E-04	42.3	5.34E-04	42.3	0%
	Other	kg	3.89	13.7	17.5	0.696	18.2	0.0496	17.6	-3%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**912**	**0**	**912**	**0**	**912**	**0**	**912**	**0%**
Energy	**Total**	**MJ**	**4,180**	**21,300**	**25,500**	**71.7**	**25,600**	**9.38**	**25,500**	**0%**
	Biomass	MJ	3,980	884	4,870	42.7	4,910	7.39	4,880	-1%
	Geothermal	MJ	46.4	12,300	12,400	5.06	12,400	0.188	12,400	0%
	Hydro power	MJ	53.0	6,890	6,940	9.95	6,950	0.854	6,940	0%
	Wind	MJ	99.1	1,230	1,330	14.0	1,350	0.947	1,330	-1%
	Other	MJ	4.87E-09	7.64E-10	5.64E-09	1.82E-11	5.65E-09	1.18E-12	5.64E-09	0%
Water (consumption of surface and ground water)										
	Total	kg	2,040	43,000	45,000	351	45,400	11.4	45,100	-1%
	Direct	kg		7,460						

Tork Xpress® Multifold Hand Towel / Slimline H2 Universal

Article(s): 184987

1,000 kg air-dry tissue + 12 kg paper packaging + 13 kg plastic packaging = 1,024 kg total.
Paper >97% virgin CTMP pulp. Bleaching agent: hydrogen peroxide (totally chlorine free).

Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
GWP (global warming), fossil	kg CO_2e	323	1,200	1,520	109	1,630	72.2	1,600	-2%
GWP (global warming), biogenic	kg CO_2e	-1,990	322	-1,670	2,930	1,260	1,530	-144	-111%
GWP (global warming), total	kg CO_2e	-1,670	1,520	-147	3,040	2,900	1,600	1,450	-50%
AP (acidification)	kg SO_2e	1.83	11.3	13.2	1.34	14.5	0.989	14.1	-3%
EP (eutrophication)	kg PO_4^{3-}e	0.277	1.36	1.64	0.485	2.13	0.141	1.78	-16%
POCP (photochemical ozone)	kg C_2H_4e	0.189	0.299	0.488	0.541	1.03	0.0687	0.557	-46%

Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
PED (energy), renewable	MJ	21,600	21,600	43,200	70.8	43,300	8.82	43,200	0%
PED (energy), non-renewable	MJ	5,790	17,400	23,200	1,500	24,700	866	24,100	-2%
PED (energy), total	MJ	27,400	39,100	66,400	1,570	68,000	874	67,300	-1%
PED (energy), % renewable	%	78.8%	55.4%	65.0%	4.5%	63.6%	1.0%	64.2%	

Waste

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste	kg	7.49E-06	9.51E-06	1.70E-05	1.57E-06	1.86E-05	1.22E-07	1.71E-05	-8%
Non-hazardous waste	kg	4.10	28.1	32.2	226	258	12.4	44.6	-83%

Tork Xpress® Multifold Hand Towel / Slimline H2 Universal cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**167**	**720**	**887**	**191**	**1,080**	**4.07**	**892**	**-17%**
	Inert rock	kg	115	592	708	0.366	708	0.568	709	0%
	Calcium carbonate	kg	13.2	8.11	21.3	2.05	23.3	0.0615	21.4	-8%
	Natural aggregate	kg	4.00	67.2	71.2	61.0	132	1.12	72.3	-45%
	Soil	kg	-10.5	39.8	29.3	26.0	55.3	0.493	29.8	-46%
	Quartz sand	kg	0.277	0.993	1.27	35.6	36.8	0.636	1.91	-95%
	Sodium chloride	kg	27.3	3.14	30.5	0.356	30.8	0.00679	30.5	-1%
	Other	kg	17.6	8.40	26.0	65.3	91.2	1.19	27.2	-70%
Energy	**Total**	**kg**	**152**	**450**	**602**	**38.8**	**640**	**20.8**	**623**	**-3%**
	Natural gas	kg	38.7	194	233	11.0	244	1.07	234	-4%
	Crude oil	kg	40.3	59.3	99.6	19.9	119	19.0	119	0%
	Hard coal	kg	44.2	39.7	84.0	2.67	86.6	0.324	84.3	-3%
	Lignite	kg	13.1	95.8	109	4.52	113	0.376	109	-4%
	Shale gas	kg	8.26	9.26	17.5	9.98E-04	17.5	6.63E-04	17.5	0%
	Tight gas	kg	3.56	38.4	41.9	9.01E-04	41.9	5.11E-04	41.9	0%
	Other	kg	3.48	13.7	17.1	0.707	17.9	0.0460	17.2	-4%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**911**	**0**	**911**	**0**	**911**	**0**	**911**	**0%**
Energy	**Total**	**MJ**	**4,130**	**21,600**	**25,800**	**70.8**	**25,800**	**8.82**	**25,800**	**0%**
	Biomass	MJ	3,940	891	4,830	42.3	4,880	6.99	4,840	-1%
	Geothermal	MJ	41.5	12,500	12,600	4.86	12,600	0.178	12,600	0%
	Hydro power	MJ	50.9	6,950	7,000	9.75	7,010	0.793	7,000	0%
	Wind	MJ	96.7	1,250	1,340	13.9	1,360	0.866	1,350	-1%
	Other	MJ	4.39E-09	7.64E-10	5.16E-09	1.81E-11	5.17E-09	1.09E-12	5.16E-09	0%
Water (consumption of surface and ground water)										
	Total	kg	2,000	43,400	45,400	349	45,800	10.5	45,400	-1%
	Direct	kg		7,460						

Tork Ultraslim Multifold Hand Towel / H4 Advanced

Article(s): 170370

1,000 kg air-dry tissue + 16 kg paper packaging + 19 kg plastic packaging = 1,035 kg total.
Paper >97% virgin CTMP pulp. Bleaching agent: hydrogen peroxide (totally chlorine free).

Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
GWP (global warming), fossil	kg CO_2e	349	1,180	1,530	134	1,670	95.9	1,630	-2%
GWP (global warming), biogenic	kg CO_2e	-2,000	322	-1,680	2,980	1,310	1,540	-141	-111%
GWP (global warming), total	kg CO_2e	-1,650	1,510	-144	3,120	2,970	1,630	1,490	-50%
AP (acidification)	kg SO_2e	1.89	11.2	13.1	2.03	15.1	1.68	14.8	-2%
EP (eutrophication)	kg PO_4^{3-}e	0.286	1.36	1.64	0.560	2.20	0.217	1.86	-15%
POCP (photochemical ozone)	kg C_2H_4e	0.196	0.296	0.492	0.585	1.08	0.103	0.595	-45%

Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
PED (energy), renewable	MJ	21,800	21,300	43,100	65.7	43,200	10.1	43,100	0%
PED (energy), non-renewable	MJ	6,460	17,200	23,700	1,810	25,500	1,160	24,800	-3%
PED (energy), total	MJ	28,300	38,500	66,800	1,880	68,700	1,170	68,000	-1%
PED (energy), % renewable	%	77.1%	55.3%	64.6%	3.5%	62.9%	0.9%	63.5%	

Waste

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste	kg	9.18E-06	9.45E-06	1.86E-05	1.63E-06	2.03E-05	1.76E-07	1.88E-05	-7%
Non-hazardous waste	kg	4.25	28.0	32.3	233	265	19.1	51.4	-81%

Tork Ultraslim Multifold Hand Towel / H4 Advanced cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**192**	**705**	**897**	**193**	**1,090**	**6.04**	**903**	**-17%**
	Inert rock	kg	136	578	713	-0.116	713	0.745	714	0%
	Calcium carbonate	kg	13.9	8.07	22.0	2.08	24.1	0.0885	22.1	-8%
	Natural aggregate	kg	5.57	67.0	72.6	62.0	135	1.69	74.3	-45%
	Soil	kg	-9.49	39.6	30.1	26.6	56.7	0.742	30.9	-46%
	Quartz sand	kg	0.303	0.991	1.29	35.9	37.2	0.964	2.26	-94%
	Sodium chloride	kg	27.9	3.14	31.1	0.360	31.5	0.0103	31.1	-1%
	Other	kg	17.7	8.35	26.0	65.9	91.9	1.80	27.8	-70%
Energy	**Total**	**kg**	**169**	**445**	**613**	**46.7**	**660**	**28.0**	**641**	**-3%**
	Natural gas	kg	42.0	189	231	11.2	242	1.45	232	-4%
	Crude oil	kg	44.0	59.4	103	26.4	130	25.5	129	-1%
	Hard coal	kg	45.8	39.6	85.4	2.98	88.4	0.431	85.8	-3%
	Lignite	kg	13.6	95.7	109	4.99	114	0.527	110	-4%
	Shale gas	kg	12.5	9.26	21.8	0.00105	21.8	7.05E-04	21.8	0%
	Tight gas	kg	5.39	38.4	43.8	9.43E-04	43.8	5.48E-04	43.8	0%
	Other	kg	5.25	13.7	18.9	1.04	20.0	0.0607	19.0	-5%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**914**	**0**	**914**	**0**	**914**	**0**	**914**	**0%**
Energy	**Total**	**MJ**	**4,270**	**21,300**	**25,600**	**65.7**	**25,700**	**10.1**	**25,600**	**0%**
	Biomass	MJ	4,060	889	4,950	44.2	4,990	8.03	4,950	-1%
	Geothermal	MJ	54.8	12,300	12,300	0.602	12,300	0.0439	12,300	0%
	Hydro power	MJ	57.1	6,930	6,990	6.75	7,000	0.885	6,990	0%
	Wind	MJ	103	1,240	1,350	14.1	1,360	1.18	1,350	-1%
	Other	MJ	5.68E-09	7.64E-10	6.45E-09	1.91E-11	6.47E-09	1.50E-12	6.45E-09	0%
Water (consumption of surface and ground water)										
	Total	kg	2,140	43,300	45,400	325	45,800	12.9	45,500	-1%
	Direct	kg		7,460						

Tork Basic Paper 1ply Centerfeed Roll M2

Article(s): 120155

1,000 kg air-dry tissue + 0 kg paper packaging + 10 kg plastic packaging = 1,010 kg total.
Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
GWP (global warming), fossil	kg CO_2e	245	1,120	1,360	120	1,480	82.5	1,440	-3%
GWP (global warming), biogenic	kg CO_2e	-3,550	1,900	-1,650	2,950	1,300	1,730	76.5	-94%
GWP (global warming), total	kg CO_2e	-3,310	3,020	-289	3,070	2,780	1,810	1,520	-45%
AP (acidification)	kg SO_2e	1.25	14.0	15.3	1.69	17.0	1.34	16.6	-2%
EP (eutrophication)	kg PO_4^{3-}e	0.204	1.32	1.53	0.520	2.05	0.177	1.70	-17%
POCP (photochemical ozone)	kg C_2H_4e	0.120	0.745	0.865	0.568	1.43	0.0865	0.951	-33%

Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
PED (energy), renewable	MJ	39,900	23,900	63,800	64.0	63,800	8.55	63,800	0%
PED (energy), non-renewable	MJ	4,070	14,100	18,200	1,640	19,800	993	19,100	-4%
PED (energy), total	MJ	44,000	38,000	81,900	1,710	83,600	1,000	82,900	-1%
PED (energy), % renewable	%	90.7%	62.9%	77.8%	3.8%	76.3%	0.9%	76.9%	

Waste

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste	kg	2.72E-06	6.69E-06	9.40E-06	1.57E-06	1.10E-05	1.21E-07	9.52E-06	-13%
Non-hazardous waste	kg	2.02	41.8	43.8	224	268	10.3	54.1	-80%

Tork Basic Paper 1ply Centerfeed Roll M2 cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**134**	**713**	**847**	**190**	**1,040**	**3.21**	**850**	**-18%**
	Inert rock	kg	161	589	749	-0.195	749	0.675	750	0%
	Calcium carbonate	kg	35.9	9.11	45.0	2.05	47.1	0.0547	45.1	-4%
	Natural aggregate	kg	3.52	53.1	56.6	61.1	118	0.808	57.4	-51%
	Soil	kg	-94.4	51.8	-42.6	26.2	-16.3	0.366	-42.2	-159%
	Quartz sand	kg	0.232	1.36	1.59	35.4	37.0	0.451	2.04	-94%
	Sodium chloride	kg	17.8	0.497	18.3	0.354	18.7	0.00490	18.3	-2%
	Other	kg	10.3	8.60	18.9	64.9	83.8	0.852	19.8	-76%
Energy	**Total**	**kg**	**105**	**345**	**450**	**42.5**	**492**	**23.8**	**473**	**-4%**
	Natural gas	kg	18.4	227	246	10.9	257	1.14	247	-4%
	Crude oil	kg	33.1	56.5	89.6	22.8	112	21.9	112	0%
	Hard coal	kg	26.8	42.8	69.6	2.91	72.6	0.352	70.0	-4%
	Lignite	kg	8.04	13.2	21.3	4.88	26.1	0.413	21.7	-17%
	Shale gas	kg	10.3	0.711	11.1	9.96E-04	11.1	6.53E-04	11.1	0%
	Tight gas	kg	4.45	2.47	6.92	8.99E-04	6.92	5.04E-04	6.92	0%
	Other	kg	3.58	1.67	5.25	1.03	6.28	0.0488	5.30	-16%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**900**	**0**	**900**	**0**	**900**	**0**	**900**	**0%**
Energy	**Total**	**MJ**	**22,600**	**23,900**	**46,500**	**64.0**	**46,600**	**8.55**	**46,500**	**0%**
	Biomass	MJ	22,500	827	23,300	43.1	23,400	6.93	23,300	0%
	Geothermal	MJ	7.58	15,700	15,700	0.541	15,700	0.0351	15,700	0%
	Hydro power	MJ	46.5	6,170	6,210	6.53	6,220	0.703	6,210	0%
	Wind	MJ	71.9	1,160	1,230	13.8	1,250	0.882	1,230	-2%
	Other	MJ	3.15E-09	1.38E-10	3.29E-09	1.88E-11	3.31E-09	1.10E-12	3.29E-09	-1%
Water (consumption of surface and ground water)										
	Total	kg	1,300	49,000	50,300	322	50,600	9.87	50,300	-1%
	Direct	kg		8,410						

Tork Roll Towel Universal

Article(s): 2187951

1,000 kg air-dry tissue + 31 kg paper packaging + 11 kg plastic packaging = 1,042 kg total.
Paper >97% virgin CTMP pulp. Bleaching agent: hydrogen peroxide (totally chlorine free).

Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
GWP (global warming), fossil	kg CO_2e	209	978	1,190	139	1,330	101	1,290	-3%
GWP (global warming), biogenic	kg CO_2e	-2,090	391	-1,700	3,020	1,320	1,570	-135	-110%
GWP (global warming), total	kg CO_2e	-1,880	1,370	-515	3,160	2,640	1,670	1,150	-56%
AP (acidification)	kg SO_2e	1.19	10.5	11.7	2.15	13.8	1.80	13.4	-3%
EP (eutrophication)	kg PO_4^{3-}e	0.213	1.00	1.22	0.574	1.79	0.231	1.45	-19%
POCP (photochemical ozone)	kg C_2H_4e	0.122	0.246	0.368	0.591	0.959	0.108	0.476	-50%

Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
PED (energy), renewable	MJ	22,900	24,900	47,900	64.9	47,900	10.1	47,900	0%
PED (energy), non-renewable	MJ	3,700	12,700	16,400	1,880	18,300	1,220	17,600	-4%
PED (energy), total	MJ	26,600	37,700	64,300	1,940	66,200	1,230	65,500	-1%
PED (energy), % renewable	%	86.1%	66.2%	74.5%	3.3%	72.4%	0.8%	73.1%	

Waste

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste	kg	1.22E-05	8.49E-06	2.07E-05	1.60E-06	2.23E-05	1.49E-07	2.09E-05	-6%
Non-hazardous waste	kg	3.09	31.5	34.6	225	260	11.6	46.2	-82%

Tork Roll Towel Universal cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**98.0**	**649**	**747**	**192**	**938**	**5.00**	**752**	**-20%**
	Inert rock	kg	76.0	630	706	-0.106	705	0.835	706	0%
	Calcium carbonate	kg	10.3	10.1	20.3	2.07	22.4	0.0780	20.4	-9%
	Natural aggregate	kg	3.20	49.5	52.7	61.7	114	1.33	54.0	-53%
	Soil	kg	-12.5	-64.4	-76.9	26.5	-50.4	0.598	-76.3	-51%
	Quartz sand	kg	0.190	1.19	1.38	35.7	37.1	0.747	2.13	-94%
	Sodium chloride	kg	11.2	12.0	23.2	0.357	23.6	0.00786	23.2	-2%
	Other	kg	9.58	10.8	20.4	65.5	85.9	1.40	21.8	-75%
Energy	**Total**	**kg**	**95.5**	**324**	**419**	**48.2**	**468**	**29.4**	**449**	**-4%**
	Natural gas	kg	21.6	193	215	11.2	226	1.45	217	-4%
	Crude oil	kg	30.4	32.5	62.9	27.8	90.8	26.9	89.8	-1%
	Hard coal	kg	24.1	53.7	77.7	3.02	80.7	0.441	78.2	-3%
	Lignite	kg	6.59	30.3	36.9	5.04	42.0	0.534	37.5	-11%
	Shale gas	kg	6.95	2.04	8.98	0.00108	8.98	7.32E-04	8.98	0%
	Tight gas	kg	2.99	8.37	11.4	9.63E-04	11.4	5.67E-04	11.4	0%
	Other	kg	2.90	3.48	6.38	1.08	7.46	0.0681	6.45	-14%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**928**	**0**	**928**	**0**	**928**	**0**	**928**	**0%**
Energy	**Total**	**MJ**	**5,150**	**24,900**	**30,100**	**64.9**	**30,100**	**10.1**	**30,100**	**0%**
	Biomass	MJ	4,950	909	5,860	44.4	5,910	8.13	5,870	-1%
	Geothermal	MJ	97.8	15,600	15,700	0.0799	15,700	0.0253	15,700	0%
	Hydro power	MJ	41.5	7,050	7,090	6.34	7,090	0.848	7,090	0%
	Wind	MJ	54.4	1,420	1,480	14.0	1,490	1.14	1,480	-1%
	Other	MJ	1.02E-08	2.45E-09	1.26E-08	1.92E-11	1.27E-08	1.44E-12	1.26E-08	-1%
Water (consumption of surface and ground water)										
	Total	kg	1,790	59,100	60,900	324	61,200	14.7	60,900	0%
	Direct	kg		15,000						

Tork Ultra Long Kitchen Towel

Article(s): 2327073

1,000 kg air-dry tissue + 26 kg paper packaging + 20 kg plastic packaging = 1,047 kg total.
Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
GWP (global warming), fossil	kg CO_2e	308	1,170	1,480	93.1	1,570	58.3	1,530	-3%
GWP (global warming), biogenic	kg CO_2e	-3,580	1,890	-1,700	2,880	1,180	1,780	86.5	-93%
GWP (global warming), total	kg CO_2e	-3,270	3,050	-220	2,970	2,750	1,840	1,620	-41%
AP (acidification)	kg SO_2e	1.41	14.5	15.9	0.706	16.6	0.347	16.2	-2%
EP (eutrophication)	kg PO_4^{3-}e	0.234	1.34	1.58	0.425	2.00	0.0787	1.66	-17%
POCP (photochemical ozone)	kg C_2H_4e	0.145	0.749	0.894	0.477	1.37	0.0247	0.918	-33%

Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
PED (energy), renewable	MJ	40,800	25,200	66,000	86.0	66,100	10.6	66,000	0%
PED (energy), non-renewable	MJ	5,590	14,700	20,300	1,290	21,600	702	21,000	-3%
PED (energy), total	MJ	46,400	39,900	86,300	1,380	87,700	713	87,000	-1%
PED (energy), % renewable	%	88.0%	63.1%	76.5%	6.2%	75.3%	1.5%	75.8%	

Waste

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste	kg	1.18E-05	6.94E-06	1.88E-05	1.60E-06	2.04E-05	1.50E-07	1.89E-05	-7%
Non-hazardous waste	kg	2.84	41.8	44.7	234	279	20.9	65.6	-76%

Tork Ultra Long Kitchen Towel cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**190**	**753**	**943**	**193**	**1,140**	**6.43**	**949**	**-17%**
	Inert rock	kg	208	625	832	1.57	834	0.404	833	0%
	Calcium carbonate	kg	38.5	9.30	47.8	2.06	49.8	0.0840	47.9	-4%
	Natural aggregate	kg	6.05	54.6	60.6	61.1	122	1.92	62.6	-49%
	Soil	kg	-93.0	54.0	-39.0	25.5	-13.5	0.821	-38.2	-183%
	Quartz sand	kg	0.343	1.36	1.71	36.0	37.7	1.12	2.82	-93%
	Sodium chloride	kg	19.2	0.494	19.7	0.361	20.1	0.0118	19.7	-2%
	Other	kg	10.8	8.86	19.7	66.1	85.8	2.07	21.8	-75%
Energy	**Total**	**kg**	**143**	**360**	**503**	**33.3**	**536**	**16.9**	**520**	**-3%**
	Natural gas	kg	30.7	240	271	11.2	282	1.05	272	-4%
	Crude oil	kg	42.6	57.0	99.6	16.0	116	15.2	115	-1%
	Hard coal	kg	30.1	44.7	74.9	2.22	77.1	0.299	75.1	-3%
	Lignite	kg	10.2	13.2	23.4	3.80	27.2	0.334	23.7	-13%
	Shale gas	kg	16.2	0.706	16.9	0.00110	16.9	7.77E-04	16.9	0%
	Tight gas	kg	6.98	2.45	9.43	9.77E-04	9.43	5.98E-04	9.43	0%
	Other	kg	6.08	1.68	7.75	0.0480	7.80	0.0383	7.79	0%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**924**	**0**	**924**	**0**	**924**	**0**	**924**	**0%**
Energy	**Total**	**MJ**	**23,100**	**25,200**	**48,300**	**86.0**	**48,400**	**10.6**	**48,300**	**0%**
	Biomass	MJ	22,900	851	23,700	41.6	23,800	8.06	23,700	0%
	Geothermal	MJ	88.0	16,700	16,800	13.8	16,800	0.528	16,800	0%
	Hydro power	MJ	68.6	6,420	6,490	16.5	6,500	1.11	6,490	0%
	Wind	MJ	92.1	1,210	1,310	14.1	1,320	0.935	1,310	-1%
	Other	MJ	1.13E-08	1.38E-10	1.14E-08	1.69E-11	1.14E-08	1.18E-12	1.14E-08	0%
Water (consumption of surface and ground water)										
	Total	kg	1,870	50,600	52,400	403	52,800	12.2	52,400	-1%
	Direct	kg		8,420						

Handee Standard-Length Roll

Article(s): 2169509 White 2s, 0000483 Print 2s, 2297220 Summer Festive 2s, 2297191 White 3s, 2323054 White 4s, 2324454 White 6s
1,000 kg air-dry tissue + 72 kg paper packaging + 43 kg plastic packaging = 1,114 kg total.
Paper >96% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

Potential Environmental Impacts

		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
GWP (global warming), fossil	kg CO_2e	423	1,120	1,540	128	1,670	92.8	1,630	-2%
GWP (global warming), biogenic	kg CO_2e	-3,630	1,860	-1,770	2,970	1,200	1,870	102	-92%
GWP (global warming), total	kg CO_2e	-3,210	2,980	-231	3,100	2,870	1,970	1,740	-39%
AP (acidification)	kg SO_2e	1.76	13.6	15.4	1.08	16.4	0.718	16.1	-2%
EP (eutrophication)	kg PO_4^{3-}e	0.290	1.32	1.61	0.488	2.10	0.141	1.75	-17%
POCP (photochemical ozone)	kg C_2H_4e	0.187	0.733	0.919	0.450	1.37	-0.00181	0.917	-33%

Primary Energy Demand (PED)

		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
PED (energy), renewable	MJ	42,400	22,500	64,900	93.1	65,000	17.7	64,900	0%
PED (energy), non-renewable	MJ	8,430	14,200	22,700	1,760	24,400	1,160	23,800	-2%
PED (energy), total	MJ	50,800	36,700	87,500	1,850	89,400	1,180	88,700	-1%
PED (energy), % renewable	%	83.4%	61.2%	74.1%	5.0%	72.7%	1.5%	73.1%	

Waste

		Manufacture			Transport + Landfill		Transport + Compost		
Indicator	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Hazardous waste	kg	2.76E-05	6.50E-06	3.41E-05	1.75E-06	3.59E-05	2.96E-07	3.44E-05	-4%
Non-hazardous waste	kg	5.95	41.2	47.2	258	305	44.6	91.7	-70%

Handee Standard-Length Roll cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**296**	**723**	**1,020**	**200**	**1,220**	**14.0**	**1,030**	**-16%**
	Inert rock	kg	291	605	896	1.78	898	0.621	896	0%
	Calcium carbonate	kg	43.0	8.82	51.8	2.15	54.0	0.176	52.0	-4%
	Natural aggregate	kg	11.6	50.7	62.3	63.4	126	4.28	66.6	-47%
	Soil	kg	-89.5	48.5	-41.0	26.5	-14.4	1.82	-39.2	-172%
	Quartz sand	kg	0.554	1.33	1.89	37.4	39.3	2.50	4.39	-89%
	Sodium chloride	kg	21.6	0.486	22.1	0.376	22.5	0.0264	22.1	-2%
	Other	kg	17.8	8.28	26.1	68.7	94.7	4.62	30.7	-68%
Energy	**Total**	**kg**	**214**	**347**	**561**	**44.5**	**606**	**28.0**	**589**	**-3%**
	Natural gas	kg	48.8	232	280	12.1	292	1.92	282	-3%
	Crude oil	kg	60.4	57.8	118	25.7	144	24.9	143	-1%
	Hard coal	kg	36.9	40.1	77.0	2.44	79.4	0.523	77.5	-2%
	Lignite	kg	13.5	12.9	26.5	4.08	30.5	0.616	27.1	-11%
	Shale gas	kg	29.9	0.696	30.6	0.00154	30.6	0.00122	30.6	0%
	Tight gas	kg	12.9	2.42	15.3	0.00133	15.3	9.47E-04	15.3	0%
	Other	kg	11.9	1.63	13.5	0.0720	13.6	0.0624	13.6	0%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**964**	**0**	**964**	**0**	**964**	**0**	**964**	**0%**
Energy	**Total**	**MJ**	**23,900**	**22,500**	**46,400**	**93.1**	**46,500**	**17.7**	**46,400**	**0%**
	Biomass	MJ	23,500	783	24,200	47.0	24,300	13.4	24,300	0%
	Geothermal	MJ	226	14,800	15,100	14.0	15,100	0.727	15,100	0%
	Hydro power	MJ	109	5,770	5,880	17.2	5,900	1.81	5,880	0%
	Wind	MJ	129	1,080	1,210	15.0	1,230	1.74	1,210	-2%
	Other	MJ	2.51E-08	1.35E-10	2.52E-08	1.80E-11	2.52E-08	2.22E-12	2.52E-08	0%
Water (consumption of surface and ground water)										
	Total	kg	2,770	46,400	49,100	413	49,600	22.0	49,200	-1%
	Direct	kg		8,440						

Handee Long Roll

Article(s): 2312551

1,000 kg air-dry tissue + 48 kg paper packaging + 31 kg plastic packaging = 1,078 kg total.
Paper >96% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
GWP (global warming), fossil	kg CO_2e	359	1,120	1,480	114	1,590	79.5	1,560	-2%
GWP (global warming), biogenic	kg CO_2e	-3,600	1,870	-1,730	2,920	1,190	1,830	93.8	-92%
GWP (global warming), total	kg CO_2e	-3,240	2,990	-255	3,030	2,780	1,900	1,650	-41%
AP (acidification)	kg SO_2e	1.59	13.6	15.2	0.923	16.1	0.563	15.8	-2%
EP (eutrophication)	kg PO_4^{3-}e	0.260	1.32	1.58	0.461	2.04	0.115	1.70	-17%
POCP (photochemical ozone)	kg C_2H_4e	0.164	0.736	0.899	0.460	1.36	0.00735	0.907	-33%

Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
PED (energy), renewable	MJ	41,400	22,500	63,900	90.1	64,000	14.7	63,900	0%
PED (energy), non-renewable	MJ	6,860	14,200	21,100	1,580	22,700	985	22,100	-3%
PED (energy), total	MJ	48,300	36,700	85,000	1,670	86,700	1,000	86,000	-1%
PED (energy), % renewable	%	85.8%	61.2%	75.2%	5.4%	73.8%	1.5%	74.3%	

Waste

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste	kg	1.93E-05	6.51E-06	2.58E-05	1.67E-06	2.75E-05	2.23E-07	2.60E-05	-5%
Non-hazardous waste	kg	5.12	41.3	46.4	245	292	31.8	78.2	-73%

Handee Long Roll cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**239**	**725**	**963**	**196**	**1,160**	**10.0**	**973**	**-16%**
	Inert rock	kg	243	606	849	1.72	851	0.555	849	0%
	Calcium carbonate	kg	40.6	8.84	49.4	2.10	51.5	0.129	49.5	-4%
	Natural aggregate	kg	8.64	50.8	59.4	62.2	122	3.02	62.5	-49%
	Soil	kg	-91.1	48.6	-42.5	26.0	-16.5	1.29	-41.2	-150%
	Quartz sand	kg	0.456	1.34	1.79	36.7	38.5	1.76	3.55	-91%
	Sodium chloride	kg	20.4	0.488	20.9	0.368	21.2	0.0186	20.9	-1%
	Other	kg	17.1	8.30	25.4	67.3	92.7	3.25	28.7	-69%
Energy	**Total**	**kg**	**175**	**347**	**522**	**40.2**	**562**	**23.7**	**546**	**-3%**
	Natural gas	kg	38.0	232	270	11.7	282	1.53	272	-4%
	Crude oil	kg	50.9	57.3	108	22.1	130	21.2	129	-1%
	Hard coal	kg	33.1	40.1	73.3	2.35	75.6	0.426	73.7	-3%
	Lignite	kg	11.7	13.0	24.7	3.95	28.6	0.487	25.1	-12%
	Shale gas	kg	22.5	0.699	23.2	0.00138	23.2	0.00106	23.2	0%
	Tight gas	kg	9.68	2.43	12.1	0.00120	12.1	8.17E-04	12.1	0%
	Other	kg	8.74	1.63	10.4	0.0629	10.4	0.0533	10.4	0%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**943**	**0**	**943**	**0**	**943**	**0**	**943**	**0%**
Energy	**Total**	**MJ**	**23,400**	**22,500**	**45,900**	**90.1**	**46,000**	**14.7**	**45,900**	**0%**
	Biomass	MJ	23,000	785	23,800	44.8	23,900	11.2	23,800	0%
	Geothermal	MJ	153	14,800	15,000	13.9	15,000	0.623	15,000	0%
	Hydro power	MJ	87.8	5,780	5,870	16.9	5,880	1.48	5,870	0%
	Wind	MJ	109	1,090	1,190	14.6	1,210	1.35	1,200	-1%
	Other	MJ	1.77E-08	1.31E-10	1.79E-08	1.75E-11	1.79E-08	1.76E-12	1.79E-08	0%
Water (consumption of surface and ground water)										
	Total	kg	2,250	46,500	48,700	409	49,100	17.5	48,700	-1%
	Direct	kg		8,430						

Handee Double-Length Roll

Article(s): 2329558

1,000 kg air-dry tissue + 33 kg paper packaging + 21 kg plastic packaging = 1,054 kg total.
Paper >96% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
GWP (global warming), fossil	kg CO_2e	324	1,120	1,440	112	1,550	77.4	1,520	-2%
GWP (global warming), biogenic	kg CO_2e	-3,570	1,860	-1,710	2,890	1,180	1,800	87.7	-93%
GWP (global warming), total	kg CO_2e	-3,240	2,980	-268	3,000	2,730	1,870	1,600	-41%
AP (acidification)	kg SO_2e	1.49	13.6	15.1	0.907	16.0	0.548	15.6	-3%
EP (eutrophication)	kg PO_4^{3-}e	0.241	1.32	1.56	0.456	2.01	0.110	1.67	-17%
POCP (photochemical ozone)	kg C_2H_4e	0.153	0.734	0.887	0.458	1.35	0.00616	0.893	-34%

Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
PED (energy), renewable	MJ	40,600	22,500	63,100	88.9	63,200	13.5	63,100	0%
PED (energy), non-renewable	MJ	6,020	14,200	20,200	1,550	21,800	956	21,200	-3%
PED (energy), total	MJ	46,700	36,700	83,300	1,640	85,000	969	84,300	-1%
PED (energy), % renewable	%	87.1%	61.3%	75.7%	5.4%	74.4%	1.4%	74.9%	

Waste

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste	kg	1.42E-05	6.50E-06	2.07E-05	1.63E-06	2.23E-05	1.75E-07	2.09E-05	-6%
Non-hazardous waste	kg	4.72	41.2	46.0	236	282	22.1	68.1	-76%

Handee Double-Length Roll cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**208**	**723**	**931**	**194**	**1,120**	**7.20**	**939**	**-16%**
	Inert rock	kg	217	605	823	1.75	824	0.584	823	0%
	Calcium carbonate	kg	39.1	8.82	48.0	2.07	50.0	0.0974	48.1	-4%
	Natural aggregate	kg	6.45	50.7	57.2	61.3	118	2.11	59.3	-50%
	Soil	kg	-91.8	48.5	-43.2	25.6	-17.6	0.906	-42.3	-140%
	Quartz sand	kg	0.428	1.34	1.76	36.1	37.9	1.22	2.99	-92%
	Sodium chloride	kg	19.8	0.486	20.3	0.362	20.7	0.0129	20.3	-2%
	Other	kg	16.6	8.28	24.9	66.3	91.2	2.27	27.1	-70%
Energy	**Total**	**kg**	**153**	**346**	**500**	**39.4**	**539**	**23.0**	**523**	**-3%**
	Natural gas	kg	34.8	232	266	11.5	278	1.34	268	-4%
	Crude oil	kg	46.6	56.9	104	21.6	125	20.8	124	-1%
	Hard coal	kg	30.6	40.1	70.7	2.31	73.0	0.389	71.1	-3%
	Lignite	kg	11.0	12.9	23.9	3.89	27.8	0.427	24.3	-13%
	Shale gas	kg	16.7	0.697	17.4	0.00135	17.4	0.00103	17.4	0%
	Tight gas	kg	7.20	2.42	9.62	0.00117	9.62	7.94E-04	9.62	0%
	Other	kg	6.33	1.62	7.95	0.0615	8.02	0.0518	8.01	0%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**930**	**0**	**930**	**0**	**930**	**0**	**930**	**0%**
Energy	**Total**	**MJ**	**22,800**	**22,500**	**45,300**	**88.9**	**45,400**	**13.5**	**45,300**	**0%**
	Biomass	MJ	22,500	783	23,300	44.1	23,400	10.5	23,300	0%
	Geothermal	MJ	108	14,800	14,900	13.8	14,900	0.560	14,900	0%
	Hydro power	MJ	74.5	5,770	5,850	16.7	5,860	1.32	5,850	0%
	Wind	MJ	98.5	1,080	1,180	14.4	1,200	1.14	1,180	-2%
	Other	MJ	1.33E-08	1.31E-10	1.34E-08	1.72E-11	1.34E-08	1.41E-12	1.34E-08	0%
Water (consumption of surface and ground water)										
	Total	kg	2,040	46,400	48,400	406	48,800	15.4	48,500	-1%
	Direct	kg		8,420						

Handee MAX

Article(s): 2325522

1,000 kg air-dry tissue + 53 kg paper packaging + 34 kg plastic packaging = 1,086 kg total.
Paper >98% virgin kraft pulp. Bleaching agent: chlorine dioxide (elemental chlorine free).

Potential Environmental Impacts

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
GWP (global warming), fossil	kg CO_2e	371	1,170	1,540	107	1,650	71.8	1,610	-2%
GWP (global warming), biogenic	kg CO_2e	-3,620	1,880	-1,740	2,930	1,190	1,840	96.8	-92%
GWP (global warming), total	kg CO_2e	-3,250	3,050	-199	3,040	2,840	1,910	1,710	-40%
AP (acidification)	kg SO_2e	1.59	14.5	16.1	0.831	16.9	0.471	16.5	-2%
EP (eutrophication)	kg PO_4^{3-}e	0.267	1.35	1.61	0.449	2.06	0.103	1.72	-17%
POCP (photochemical ozone)	kg C_2H_4e	0.167	0.748	0.915	0.467	1.38	0.0153	0.930	-33%

Primary Energy Demand (PED)

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
PED (energy), renewable	MJ	42,000	25,100	67,100	89.3	67,200	13.9	67,100	0%
PED (energy), non-renewable	MJ	7,130	14,700	21,900	1,480	23,400	884	22,800	-3%
PED (energy), total	MJ	49,100	39,900	89,000	1,570	90,600	898	89,900	-1%
PED (energy), % renewable	%	85.5%	63.0%	75.4%	5.7%	74.2%	1.6%	74.7%	

Waste

Indicator	Unit	Manufacture			Transport + Landfill		Transport + Compost		
		Upstream	Core	To Gate	Downstream	Total	Downstream	Total	Reduction
Hazardous waste	kg	2.09E-05	6.94E-06	2.79E-05	1.68E-06	2.95E-05	2.30E-07	2.81E-05	-5%
Non-hazardous waste	kg	3.61	41.8	45.4	248	294	34.9	80.3	-73%

Handee MAX cntd.

Resource Use			Manufacture			Transport + Landfill		Transport + Compost		
Category	**Flow**	**Unit**	**Upstream**	**Core**	**To Gate**	**Downstream**	**Total**	**Downstream**	**Total**	**Reduction**
Non-renewable resources										
Materials	**Total**	**kg**	**246**	**753**	**999**	**197**	**1,200**	**10.8**	**1,010**	**-16%**
	Inert rock	kg	255	624	879	1.63	880	0.466	879	0%
	Calcium carbonate	kg	41.1	9.29	50.4	2.11	52.5	0.135	50.5	-4%
	Natural aggregate	kg	9.30	54.5	63.8	62.5	126	3.31	67.2	-47%
	Soil	kg	-91.5	53.9	-37.6	26.1	-11.5	1.40	-36.2	-215%
	Quartz sand	kg	0.426	1.36	1.79	36.9	38.6	1.93	3.72	-90%
	Sodium chloride	kg	20.4	0.494	20.9	0.370	21.3	0.0204	21.0	-1%
	Other	kg	11.6	8.85	20.4	67.6	88.0	3.57	24.0	-73%
Energy	**Total**	**kg**	**182**	**360**	**542**	**37.7**	**580**	**21.3**	**563**	**-3%**
	Natural gas	kg	40.0	240	280	11.7	292	1.47	282	-3%
	Crude oil	kg	51.4	57.5	109	19.8	129	18.9	128	-1%
	Hard coal	kg	34.0	44.7	78.7	2.32	81.0	0.402	79.1	-2%
	Lignite	kg	11.9	13.2	25.1	3.94	29.0	0.470	25.6	-12%
	Shale gas	kg	24.4	0.705	25.1	0.00128	25.1	9.62E-04	25.1	0%
	Tight gas	kg	10.5	2.45	12.9	0.00112	12.9	7.43E-04	12.9	0%
	Other	kg	9.51	1.68	11.2	0.0575	11.2	0.0479	11.2	0%
Renewable resources										
Materials	**Biomass (dry)**	**kg**	**947**	**0**	**947**	**0**	**947**	**0**	**947**	**0%**
Energy	**Total**	**MJ**	**23,800**	**25,100**	**49,000**	**89.3**	**49,100**	**13.9**	**49,000**	**0%**
	Biomass	MJ	23,500	851	24,300	44.1	24,400	10.5	24,300	0%
	Geothermal	MJ	168	16,700	16,800	13.9	16,900	0.641	16,800	-1%
	Hydro power	MJ	91.5	6,410	6,510	16.8	6,520	1.47	6,510	0%
	Wind	MJ	112	1,210	1,320	14.6	1,340	1.35	1,330	-1%
	Other	MJ	1.93E-08	1.38E-10	1.94E-08	1.75E-11	1.94E-08	1.69E-12	1.94E-08	0%
Water (consumption of surface and ground water)										
	Total	kg	2,350	50,500	52,900	408	53,300	17.1	52,900	-1%
	Direct	kg		8,430						

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EPD registration and verification

Declaration owner:	**Asaleo Care Ltd**
	Web: http://www.asaleocare.com
	Email: customerservice@asaleocare.com
	Post: 30-32 Westall Road, Springvale VIC 3171, Australia
EPD produced by:	**thinkstep Ltd**
	Web: www.thinkstep-anz.com
	Email: anz@thinkstep.com
	Post: 11 Rawhiti Road, Pukerua Bay 5026, Wellington, New Zealand
EPD programme operator:	**EPD Australasia Ltd**
	Web: http://www.epd-australasia.com
	Email: info@epd-australasia.com
	Post: 315a Hardy Street, Nelson 7010, New Zealand
Product Category Rules (PCR):	**PCR 2011:05 Tissue Products, Version 2.0, 2015-10-01**
ANZSIC v1.0 classification:	C152400: "Sanitary Paper Product Manufacturing"
UN CPC v2 classification:	32131: "Toilet or facial tissue stock, towel or napkin stock and similar paper, cellulose wadding and webs of cellulose fibres"
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com.
Independent verification of the declaration and data, according to ISO 14025:2006:	☐ EPD process certification (Internal) ☑ EPD verification (External)
Third party verifier:	**Andrew D Moore, Life Cycle Logic**
	Web: http://www.lifecyclelogic.com.au
	Email: info@lifecyclelogic.com.au
	Post: PO Box 571, Fremantle WA 6959, Australia
Approved by:	EPD Australasia Ltd
Version history	v1.0 Initial release v1.1 Correction to POCP results v1.2 Addition of articles 170370 and 2187951 v2.0 Revision of all data. Addition of Handee brand and new products.

The EPD owner has the sole ownership, liability and responsibility for the EPD.