Zip HydroTap®

Environmental Product Declaration

Produced under EPD Australasia
in accordance with ISO 14025 and EN 15804+A1

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ECO PLATFORM EPD VERIFIED

AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION

ENVIRONMENTAL PRODUCT DECLARATION (EPD)

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CEN standard EN 15804 served as the core PCR

PCR:	PCR 2012:01 Construction products and Construction services, Version 2.34
PCR review was conducted by:	The Technical Committee of the International EPD® System
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Independent verification of the declaration and data, according to ISO 14025:	☐ EPD process certification (Internal) ☒ EPD verification (External)
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Approved by	EPD Australasia Ltd
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The EPD owner has the sole ownership, liability and responsibility for the EPD.

Australia Post
Melbourne, Australia

CONTENTS

Zip – The Great Australian Success Story.

From a small Sydney manufacturer of water heaters for kitchens and bathrooms in 1947 to an industry leader with exports to over 75 countries, Zip continues to set the global standard. Over the last 75 years, our business has grown with offices across Australia, as well as in the United Kingdom, The United Arab Emirates and New Zealand.

At Zip, we are driven by innovation and a passion for providing quality products and service. By incorporating world-class filtration technologies we have evolved from a company that provided instant boiling water to a company that has refreshed drinking water. We promise to instantly deliver water any way you like it – It is water at its best.

John Doumani, President - Zip International

THE WORLD'S MOST ADVANCED DRINKING WATER SYSTEM

As world leaders in instant drinking water systems, Zip Water invented the innovative HydroTap, the smart and essential addition for every workplace kitchen.

RESPONSIBLE MANUFACTURING

Zip does not just design energy-efficient products; we have complete organisational dedication to sustainable environmental management and quality and are certified to ISO 14001 and ISO 9001. We take care to ensure that each Zip HydroTap is manufactured sustainably and to the highest quality possible.

MANUFACTURING STANDARDS

WaterMark and WRAS Product Approvals: Whole products such as valves, boilers and showers undergo mechanical and water quality testing. This type of approval demonstrates full compliance with requirements of the regulations and by-laws accepted by every water supplier in Australia, New Zealand and the UK. All HydroTap G5 models carry a full WaterMark and WRAS approval so you can be sure that you are receiving the safest and highest quality product available on the market today.

ADVANCED TECHNOLOGY

Whichever Zip HydroTap model you choose, you can be quite certain of one thing. Nobody offers you a more advanced drinking water system than Zip.

- Patented Zip PowerPulse™ technology
- Advanced thermal insulation
- Conserves water. Air-cooled system that does not produce any waste water
- Conserves energy. Choice of 4 energy-saving modes for optimum energy efficiency.
- RoHS Compliant. Manufactured to comply with the European Restriction of Hazardous Substances Directive 2002/95/EC.

WI-FI CONNECTIVITY

The world's first Wi-Fi connected cloud management system for drinking water systems. Secure and simple to use ZIP ASSIST™ and The Internet of Things (IoT) is set to revolutionise the way workplace solutions are managed.

WATER FILTRATION

MicroPurity™. Our 0.2 micron water filtration removes sediment, volatile organic compounds, lead and parasitic protozoan micro-organisms such as Cryptosporidium and Giardia.

GLOBALY RECOGNISED EPD

LEED COMPLIANT

WIFI CONNECTIVITY

EIGHT REASONS WHY

SPECIFYING THE ZIP HYDROTAP IS THE RIGHT CHOICE

BREEAM COMPLIANT

100% WATER EFFICIENT

GREEN STAR COMPLIANT

MEETS ISO 14025 & EN 15804

ADVANCED ENERGY EFFICIENCY

Environmental Product Declaration

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). EPDs within the same product category from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. The EPD owner has the sole ownership, liability and responsibility for the EPD.

DECLARED UNIT

The declared unit is the fraction of the appliance's life cycle needed to deliver 1 litre of average drinking water over a 7-year service life, reflecting a typical office refurbishment period (Forsythe, 2007).

Only EPDs representing the same appliance size class, region and included information modules may be compared directly.

To convert the results (pages 13-16) to the total impacts for a whole product over 7 years, please multiply by the total drinking water consumed over that period:

- BC 160/125: 43,942 litres
- BC 240/175: 94,162 litres

These whole-product values can then be converted to impacts per kilogram of HydroTap by dividing by the total product mass:

- BC 160/125: 28.2 kg
- BC 240/175: 29.8 kg

INDUSTRY CLASSIFICATION

The appropriate ANZSIC 2006 code is C245200, "Fixed Space Heating, Cooling and Ventilation Equipment Manufacturing". The closest matching UN CPC (v2.1) codes applying to these products are 43913 ("Refrigerating and freezing equipment and heat pumps, except household type equipment") and 44817 ("Electric instantaneous or storage water heaters and immersion heaters").

Table 1: Products included in this EPD

	BOILING. CHILLED	
Model	BC 160/125	BC 240/175
Recommended No. of People	60	100
Boiling cups/hour	160	240
Chilled glasses/hour	125	175
Hot temp range	98°C ± 2°C	
Hot water output	3.0 - 3.6 L/Min	
Cold Temp range	5°C - 15°C	
Cold water output	4.0 - 5.6 L/Min	
Refrigerant	R134a - 180 g	R134a - 210 g
Power	220V - 240V AC 50/60Hz single phase	
Electrical Rating	2.2 kW	2.2 kW
Booster Rating	NA	2.2 kW
Power requirement	1 x 10 A GPO	2 x 10 A GPO
Dimensions W, D, H (mm)	394, 464, 333	394, 464, 334
Approvals	WaterMark, WRAS, RCM, C-Tick, CE, ARC	
Temperature control technology	Electronic	
Cooling technology	Air Cooled	

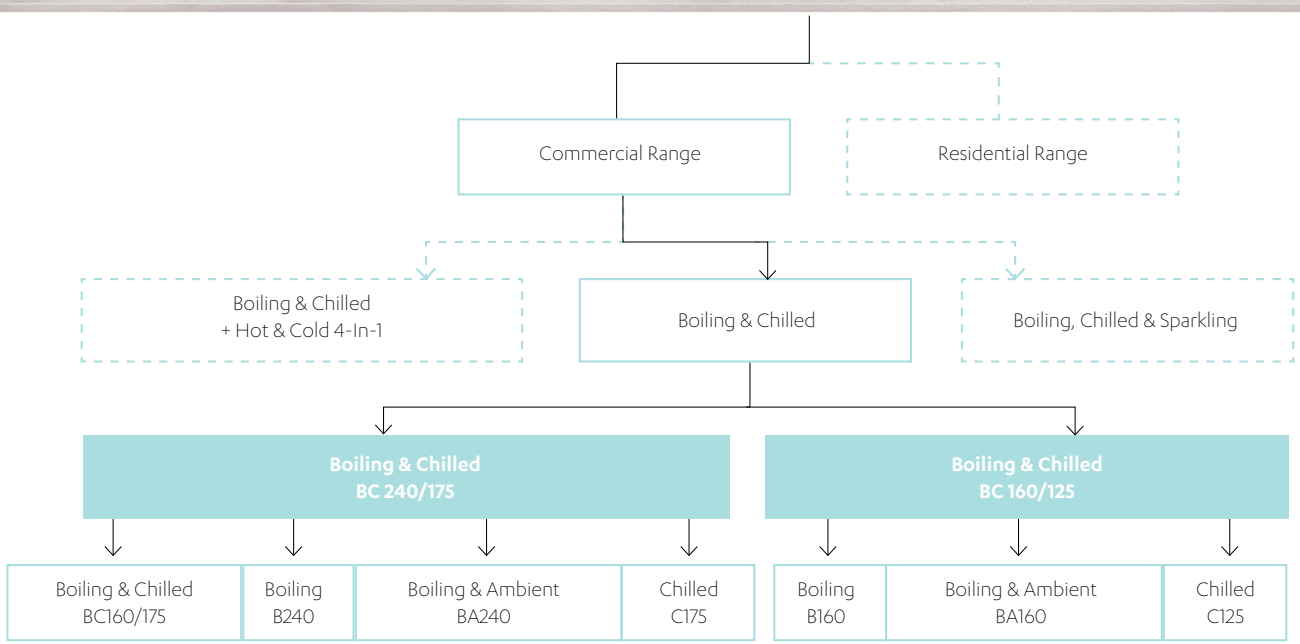

Figure 1: Product hierachy

Appliance performance specifications

Table 2 shows calculated and measured performance specifications of each appliance over their typical service life. The methods for determining these specifications are documented in the supplementary report.

Table 2: Appliance performance

Metric	Abbr.	Unit	BC 160/125		BC 240/175	
			AUS	UK	AUS	UK
Drinking water consumption over the reference service life	W_D	l	43900		94200	
Energy efficiency over the reference service life	η_E	%	43.8	65.6	51.8	70.2
Water efficiency over the reference service life	η_W	%	100		100	
Standby power loss	E_L	W	36.0		36.8	
Heating efficiency	η_H	W/W	1.00		1.00	
Chilling efficiency (COP)	η_C	W/W	2.26		2.33	

CONTENT DECLARATION

Table 3 below presents the material content of both products. This composition has been calculated from parts that can be manually separated. Parts that consist of many materials and/or cannot be easily separated (e.g. LCD and printed circuit board assemblies) have not been broken down into their constituent materials. Neither product contains any materials included on the Candidate List of substances of very high concern under the European REACH Regulation (EC 1907 / 2006) at a concentration greater than 0.1% weight/weight.

Table 3: Material content declaration

Material	BC 160/125		BC 240/175	
	kg	%	kg	%
Acrylonitrile butadiene styrene (ABS)	0.13	0.4%	0.13	0.4%
Aluminium (excluding in electronics)	1.03	3.3%	1.03	3.2%
Brass (excluding in electronics)	0.44	1.4%	0.44	1.4%
Cables (copper with CPE insulation)	0.27	0.9%	0.48	1.5%
Cables (copper with PS-based insulation)	0.07	0.2%	0.07	0.2%
Cables (copper with PVC insulation)	0.001	0.004%	0.001	0.004%
Cables (copper with silicone insulation)	0.17	0.5%	-0.04	-0.1%
Carbon (excluding in other parts)	0.08	0.3%	0.08	0.3%
Cardboard and paper	0.06	0.2%	0.06	0.2%
Ceramics	0.10	0.3%	0.10	0.3%
Copper (excluding in electronics)	2.41	7.7%	2.54	8.0%
Display (LCD)	0.04	0.1%	0.04	0.1%
Glass fibre reinforcing	0.64	2.0%	0.62	1.9%
Polyamide (PA)	0.95	3.0%	0.90	2.8%
Polycarbonate (PC)	0.00	0.0%	0.00	0.0%
Polycarbonate/ABS blend	1.03	3.3%	1.03	3.2%
Printed circuit board assemblies (electronics)	0.31	1.0%	0.32	1.0%
Polyethylene (PE)	0.05	0.2%	0.05	0.2%
Polyphosphates	0.03	0.1%	0.03	0.1%
Polyoxymethylene (POM)	0.11	0.3%	0.15	0.5%
Polypropylene (PP)	0.39	1.3%	0.40	1.3%
Polyphenylene ether (PPE)	0.10	0.3%	0.10	0.3%
Polyphenylene sulfide (PPS)	1.08	3.4%	1.08	3.4%
Polystyrene (PS)	0.35	1.1%	0.35	1.1%
Polyvinyl chloride (PVC)	0.01	0.0%	0.00	0.0%
Refrigerant R134a	0.18	0.6%	0.21	0.7%
Silica	0.01	0.0%	0.01	0.0%
Steel, mild and carbon steel	12.38	39.4%	12.84	40.3%
Steel, stainless	2.35	7.5%	2.17	6.8%
Thermosetting plastics	0.59	1.9%	0.59	1.9%
Thermoplastic polyurethane (TPU)	0.05	0.2%	0.05	0.2%
Zinc (excluding zinc plated steel)	0.75	2.4%	0.75	2.4%
Subtotal (product)	**26.18**	**83.3%**	**26.59**	**83.5%**
Packaging: cardboard	5.19	16.5%	5.19	16.3%
Packaging: polyethylene (PE)	0.06	0.2%	0.06	0.2%
Subtotal (packaging)	**5.25**	**16.7%**	**5.25**	**16.5%**
Total	**31.42**	**100.0%**	**31.84**	**100.0%**
Measured mass of packaged product	**28.2**		**29.8**	

SYSTEM BOUNDARY

As shown in Table 4 below, this EPD is of the 'cradle-to-gate' type with options. The options include use (Modules B1, B2, B3, B6 and B7), end-of-life processing (Modules C1, C2, C3 and C4) and recycling potential (Module D). An infographic view of this is presented on page 9.

Table 4: Modules included in the scope of the EPD

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundary
Raw material supply	Transport of raw materials	Manufacturing	Transport to customer	Construction / Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to waste processing	Waste processing	Disposal	Reuse-Recovery-Recycling - Potental
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	MND	MND	X	X	X	X	X	X	X

X = included in the EPD; MND = module not declared (such a declaration shall not be regarded as an indicator result of zero)

The following modules have not been declared in this EPD:

- B4 (replacement) is not expected before the office itself is refurbished and typically a new unit is then installed to match the new décor.
- B5 (refurbishment) is excluded as the assumed lifetime is defined to align with the typical refurbishment cycle for office buildings.

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PRODUCTION (MODULE A)

Zip designs and manufactures its HydroTap® product range at its headquarters in Sydney, Australia. HydroTap products are manufactured from raw materials, sheet metals, electronic components, plastic components and packaging materials (module A1), which are transported to Zip via road, rail and sea (module A2). These materials and component parts are assembled on-site and all products undergo rigorous quality checks before being packaged for sale. Zip then distributes products locally via road transport and uses sea transport for products exported to its subsidiaries in the United Kingdom, New Zealand and the United Arab Emirates, as well as many other export distribution partners (module A4). Products are installed by a qualified technician who is assumed to recycle packaging waste (module A5).

USE (MODULE B)

The following life cycle modules are considered in the use phase:

- Maintenance (module B2) includes production and shipping of one water filter per year, disposal of the used water filter and used packaging, and travel for a technician. Over the assumed 7-year life of the product, 6 replacement filters must be installed.
- Repair (module B3) includes production of typical replacement parts over the product's life, travel for a technician, and disposal of scrap parts and used packaging.
- Operational energy demand (module B6) includes energy for water heating, chilling and standby losses.
- Operational water demand (module B7) is the drinking water dispensed by each product.

Table 5 displays the operational energy and water demand calculated according to the declared unit. The energy required to heat or cool the required volume of water from the region's inlet water temperature to the outlet temperatures, along with any losses, has been determined according to the thermal efficiencies of each unit, as described in the supplementary report. As both the BC160/125 and BC 240/175 are air-cooled, no waste water is assumed to be produced in the process of heating or chilling the drinking water. Therefore, the water consumption of both units is assumed to equal the volume of water consumed by the users.

Table 5: Energy and water consumption

Metric	Abbr.	Unit	BC 160/125		BC 240/175	
			AUS	UK	AUS	UK
Energy demand over the reference service life per litre drinking water (Module B6)	E_{RSL}	kWh/l	0.0794	0.102	0.0530	0.0753
Water consumption over the reference service life per litre drinking water (Module B7)	W_{RSL}	l/l	1.00		1.00	

END OF LIFE (MODULE C)

100% of products are assumed to be collected at end-of-life, as both products declared in this EPD include a chilling function and must therefore be de-gassed before they can be properly disposed of. Of the products collected by Zip at end-of-life, all parts are separated for recycling. It is assumed that a third-party recycler would apply a similar approach due to the high value of the materials in the product (particularly the stainless steel, conventional steel, aluminium and copper).

The following scenario is assumed:

- 100% of metals are recycled.
- 100% of unreinforced thermoplastics are recycled.
- 100% of reinforced plastics and thermosetting plastics are incinerated.
- 100% of printed circuit board assemblies are sent to a recycler, with copper and precious metals (gold, silver and palladium) being recovered and the remainder incinerated.

Both the product and its packaging are reported in the indicators "Use of renewable primary energy resources used as raw materials" ("PERM") and "Use of non-renewable primary energy resources used as raw materials" ("PENRM"). PERM and PENRM are reported as negative values were materials are recycled or recovered, but not when landfilled.

RECOVERY AND RECYCLING POTENTIAL (MODULE D)

Module D starts at the "end of waste" stage, when the materials and components that can be recycled, recovered or reused are separated and are considered to have value again as a potential input into the life cycles of other products. Module D declares a potential credit or burden for the net recycling of the product's materials. Secondary materials used in Zip's products are first subtracted from the overall amount of recycled materials after the first life cycle. If the net balance is positive, a credit is given in module D.

The life of a ZIP HYDROTAP

CARBON FOOT PRINT

BC240/175
199kg CO_2-eq

BC160/125
197kg CO_2-eq

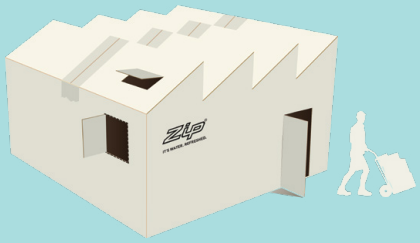
A1

SHEET METAL
ELECTRONICS
PLASTICS
PACKAGING

A2

TRANSPORT

A3



RECYCLED

100% CARDBOARD WASTE

100% TIMBER PALLETS

100% SHEET METAL

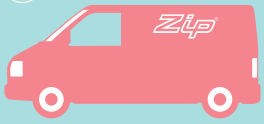
A3

WATER
ELECTRICITY
NATURAL GAS

INSTALLATION

ALMOST **20,000** ZIP HYDROTAPS ARE INSTALLED GLOBALLY EACH YEAR

A5



A4

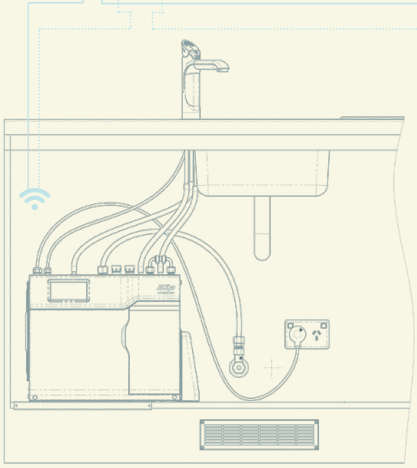
TRANSPORT

PRODUCT LIFE

ASSUMED **7 YEAR** LIFE

FACT: ZIP HYDROTAPS HAVE BEEN KNOWN TO LAST FOR OVER 15 YEARS

B1

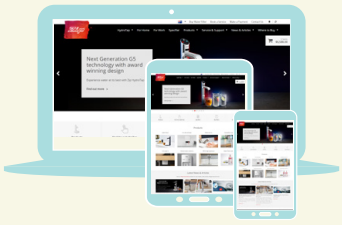


REPAIR
B3

MAINTENANCE
B2

WATER
B7

ELECTRICITY
B6



C2

END OF LIFE TRANSPORT

C3

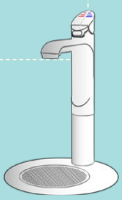
RECYCLE

RECYCLED

ASSUMED SCENARIO
100% OF METALS
100% OF THERMOPLASTICS
100% OF COPPER AND PRECIOUS METALS
99.8% OF REFRIGERANT RECLAIMED

C4

DISPOSAL



LIFE CYCLE INVENTORY (LCI) DATA

Primary data were originally sourced for Zip's manufacturing facility in Sydney, Australia for the Zip HydroTap G4 and covered the financial year from July 2015 to June 2016. All data related to the bill of materials (BOM) for the Zip HydroTap G5 has been updated in this EPD. The data for final assembly remains the same as for the Zip HydroTap.

Data for all energy inputs, transport processes and raw materials are from GaBi Databases 2021 (Sphera 2021). Most datasets have a reference year between 2017 and 2020 and all fall within the 10 year limit allowable for generic data under EN 15804.

KEY ASSUMPTIONS

Fugitive refrigerant emissions: The Zip HydroTap has a closed refrigeration system, meaning that fugitive refrigerant emissions are relatively rare. It is assumed that, on average, 2% of the refrigerant escapes over the full product life cycle, apportioned as follows: 0.2% during manufacture (module A3), 1.0% during the product's lifetime (B1), 0.1% during repair (B3) and 0.2% during de-gassing at end-of-life (C3).

Travel for technicians: It is assumed that one trip by a Zip technician is required for installation (module A3), six for regular maintenance (B2) and 1.71% of a trip for repair (B3) based on Zip's typical repair rate.

Use case (modules B6 and B7):

- Heating water via an electric element is assumed to have a thermal efficiency of 100%. Cooling efficiency is based on the coefficient of performance (COP) of the compressor used (183% at -5°C for the BC 160/125 and 192% at -5°C for the BC 240/175) following EN 12900:2013.
- Hot water is dispensed at a temperature of 98°C. Chilled water is dispensed at 5°C.
- Each unit is installed and operated in a climate-controlled office environment, assumed to be 22°C for both regions.
- Each appliance is fully operational 24 hours per day, 7 days per week. The energy-saving features available in the Zip HydroTap are assumed not to be used.
- 7-year lifetime, based on typical office refurbishment cycles (Forsythe, 2007).
- Electricity is taken from the average country grid mix from the GaBi Databases 2021 (Sphera 2021): "AU: Electricity grid mix" and "GB: Electricity grid mix" (both with a reference year of 2017).
- The proportion of ingested drinking water that leaves the local watershed and is therefore treated as consumptive water use is 74% in Australia and 34% in the UK. This is calculated as follows:
  - 34% of ingested water evaporates while 64% requires wastewater treatment (calculated from Lewis et al. 2014, pp. 290-291).
  - In Australia, 37.2% of treated wastewater is discharged to surface water and 62.8% to sea water (Australian Government 2015, Table 7.19).
  - In the UK, 88.1% of treated wastewater is discharged to surface water and 11.9% to sea water (Defra, 2012, Table 9b).

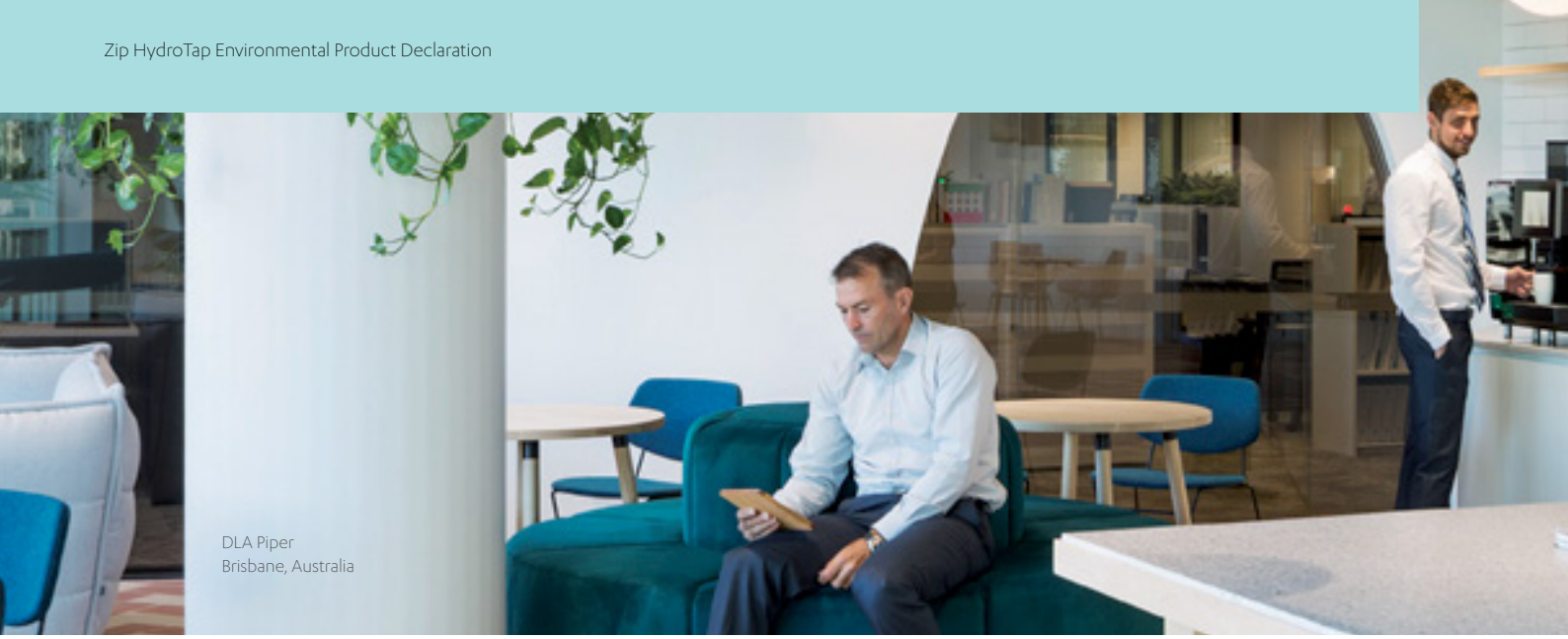
A carbon footprint of 0.915 kg CO_2e/kWh is used for the Australian electricity mix, made up of 46% hard coal, 17% lignite, 20% natural gas, 6% hydro, 5% wind, 3% solar photovoltaic, 2% fuel oil and 1% other sources. A carbon footprint of 0.307 kg CO_2e/kWh is used for the UK electricity mix, made up of 40% natural gas, 21% nuclear, 15% wind, 7% hard coal, 6% solid biomass, 3% solar photovoltaic, 3% hydro, 2% biogas, 2% from waste and 1% other sources.

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 2021, section 7.5.4). All other reported data were incorporated and modelled using the best available life cycle inventory data.

ALLOCATION

For foreground data, factory overheads (energy, water and waste) for assembly and repair were allocated based on man-hours worked. Allocation in background data was performed as documented in GaBi Databases 2021 (Sphera 2021).



DLA Piper
Brisbane, Australia

ENVIRONMENTAL INDICATORS

ENVIRONMENTAL IMPACT INDICATORS

The following indicators describe potential environmental impacts for each product per declared unit. EN 15804 and PCR 2012:01 v2.1 require these indicators to be calculated based on Leiden University's Institute of Environmental Sciences (CML) characterisation factors (as updated in 2012).

Abbr.	Name	Unit	Description
GWP	Global Warming Potential	kg CO_2-eq.	A measure of greenhouse gas emissions, such as carbon dioxide and methane. These emissions increase absorption of radiation emitted by the earth, intensifying the natural greenhouse effect.
ODP	Ozone Layer Depletion Potential	kg CFC11-eq.	A measure of air emissions that contribute to the depletion of the stratospheric ozone layer, causing higher levels of ultraviolet B (UVB) to reach the earth's surface with detrimental effects on humans, animals and plants.
AP	Acidification Potential	kg SO_2-eq.	A measure of emissions that cause acidifying effects to the environment. Acidification potential is a measure of a molecule's capacity to increase the hydrogen ion (H^+) concentration in the presence of water, thus decreasing the pH value. Potential effects include fish mortality, forest decline and the deterioration of building materials.
EP	Eutrophication Potential	kg PO_4^{3-}- eq.	A measure of nutrient enrichment that may cause an undesirable shift in species composition and elevated biomass production in both aquatic and terrestrial ecosystems. It includes potential impacts of excessively high levels of macronutrients, the most important of which are nitrogen (N) and phosphorus (P).
POCP	Photochemical Ozone Creation Potential	kg C_2H_4-eq.	A measure of emissions of precursors that contribute to ground level smog formation (mainly ozone O_3), produced by the reaction of volatile organic compounds (VOCs) and carbon monoxide in the presence of nitrogen oxides under the influence of UV light. Ground level ozone may be harmful to human and ecosystem health and may also damage crops.
ADPE ADPF	Abiotic Depletion Potential – Elements & Fossil Fuels	kg Sb-eq. MJ	The consumption of non-renewable resources leads to a decrease in the future availability of the functions supplied by these resources. Depletion of mineral resource elements (ADPE) and non-renewable fossil energy resources (ADPF) are reported separately.

RESOURCE INDICATORS

The following indicators describe the use of renewable and non-renewable material resources, renewable and non-renewable primary energy, and water.

``	Indicator	Unit
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ (net calorific value)
PERM	Use of renewable primary energy resources used as raw materials	MJ (net calorific value)
PERT	Total use of renewable primary energy resources	MJ (net calorific value)
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ (net calorific value)
PENRM	Use of non-renewable primary energy resources used as raw materials	MJ (net calorific value)
PENRT	Total use of non-renewable primary energy resources	MJ (net calorific value)
SM	Use of secondary material	kg
RSF	Use of renewable secondary fuels	MJ (net calorific value)
NRSF	Use of non-renewable secondary fuels	MJ (net calorific value)
FW	Use of net fresh water	m^3

WASTES AND OTHER OUTPUTS

The following indicators describe the production of waste through the life cycle, as well as materials and components that are reused, recycled or sent for energy recovery.

Abbrev.	Indicator	Unit
HWD	Hazardous waste disposed	kg
NHWD	Non-hazardous waste disposed	kg
RWD	Radioactive waste disposed	kg
CRU	Components for reuse	kg
MFR	Materials for recycling	kg
MER	Materials for energy recovery	kg
EEE	Exported electrical energy	MJ (net calorific value)
EET	Exported thermal energy	MJ (net calorific value)

RESULTS OF ASSESSMENT

Table 6: Environmental impacts, HydroTap BC160/125 in Australia

	Production	Distribution	Installation	Use Phase Emissions	Mainten-ance	Repair	Operational Energy	Operational Water	Waste Removal	Waste Transport	Waste Processing	Waste Disposal	Additional Info.
Environmental impact	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP [kg CO_2-eq.]	4.48E-03	4.08E-05	1.80E-04	5.86E-06	1.24E-03	6.73E-05	7.36E-02	7.22E-04	0.00E+00	3.80E-05	1.72E-04	1.22E-04	-2.64E-03
ODP [kg CFC11-eq.]	9.55E-13	6.98E-21	2.78E-20	0.00E+00	1.28E-16	4.74E-17	5.88E-16	6.12E-18	0.00E+00	5.67E-21	1.37E-18	2.42E-20	-3.58E-14
AP [kg SO_2-eq.]	2.67E-05	1.50E-07	5.40E-07	0.00E+00	3.85E-06	2.81E-08	2.99E-04	8.34E-07	0.00E+00	1.44E-07	4.70E-07	3.96E-08	-1.12E-05
EP [kg PO_4^{3-}-eq.]	1.57E-06	4.05E-08	1.32E-07	0.00E+00	8.43E-07	5.32E-09	2.69E-05	3.02E-06	0.00E+00	3.52E-08	4.49E-08	9.91E-09	-6.18E-07
*POCP [kg C_2H_4-eq.]	1.62E-06	-6.53E-08	-2.26E-07	0.00E+00	-1.20E-06	-646E-09	1.61E-05	9.63E-08	0.00E+00	-6.23E-08	5.52E-08	2.63E-09	-8.65E-07
ADPE [kg Sb-eq.]	5.05E-07	1.26E-11	6.13E-12	0.00E+00	6.53E-11	1.51E-10	6.09E-09	6.80E-11	0.00E+00	1.30E-12	1.37E-11	3.07E-13	-2.73E-07
ADPF [MJ]	6.04E-02	4.83E-04	2.42E-03	0.00E+00	1.93E-02	1.14E-04	8.30E-01	4.78E-03	0.00E+00	5.23E-04	1.58E-03	3.31E-05	-3.02E-02
Resource use	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE [MJ]	1.34E-02	2.34E-05	1.28E-05	0.00E+00	5.05E-04	6.16E-06	1.44E-01	1.47E-03	0.00E+00	1.73E-06	3.88E-04	5.71E-06	-3.31E-03
PERM [MJ]	1.80E-03	0.00E+00	-1.77E-03	0.00E+00	1.55E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.22E-04	0.00E+00	0.00E+00
PERT [MJ]	1.52E-02	2.34E-05	-1.76E-03	0.00E+00	6.59E-04	6.16E-06	1.44E-01	1.47E-03	0.00E+00	1.73E-06	2.66E-04	5.71E-06	-3.31E-03
PENRE [MJ]	5.84E-02	5.78E-04	2.45E-03	0.00E+00	1.78E-02	9.10E-05	8.33E-01	5.85E-03	0.00E+00	5.26E-04	1.70E-03	1.87E-03	-3.15E-02
PENRM [MJ]	7.06E-03	0.00E+00	0.00E+00	0.00E+00	1.98E-03	2.70E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.10E-03	-1.83E-03	0.00E+00
PENRT [MJ]	6.55E-02	5.78E-04	2.45E-03	0.00E+00	1.98E-02	1.18E-04	8.33E-01	5.85E-03	0.00E+00	5.26E-04	-5.40E-03	3.66E-05	-3.15E-02
SM [kg]	1.55E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	2.64E-05	1.01E-07	4.69E-08	0.00E+00	9.46E-07	2.22E-08	4.09E-04	7.57E-04	0.00E+00	2.78E-09	1.23E-06	2.79E-07	-1.77E-05
Waste and output flows	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD [kg]	3.54E-10	4.85E-14	1.97E-14	0.00E+00	2.82E-12	6.57E-12	7.71E-11	1.15E-12	0.00E+00	3.62E-15	1.94E-13	7.28E-15	-1.91E-10
NHWD [kg]	6.89E-04	5.24E-08	5.04E-08	0.00E+00	9.59E-05	2.35E-07	2.21E-04	7.49E-04	0.00E+00	5.26E-08	7.25E-07	2.36E-05	-2.21E-04
RWD [kg]	1.29E-06	1.39E-09	4.19E-10	0.00E+00	1.02E-07	1.17E-09	1.54E-07	4.09E-07	0.00E+00	5.63E-10	3.25E-08	1.38E-09	-3.60E-07
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	6.71E-05	0.00E+00	1.18E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.78E-04	0.00E+00	0.00E+00
MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.03E-06	0.00E+00	0.00E+00
EEE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-04	0.00E+00
EET [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.21E-04	0.00E+00

	Production	Distribution	Installation	Use Phase Emissions	Mainten-ance	Repair	Operational Energy	Operational Water	Waste Removal	Waste Transport	Waste Processing	Waste Disposal	Additional Info.
Environmental impact	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP [kg CO_2-eq.]	2.11E-03	1.91E-05	8.40E-05	3.19E-06	5.77E-04	3.60E-05	4.93E-02	7.22E-04	0.00E+00	1.81E-05	8.15E-06	5.54E-05	-1.23E-03
ODP [kg CFC11-eq.]	5.17E-13	3.28E-21	1.29E-20	0.00E+00	5.96E-17	2.32E-17	3.94E-16	6.12E-18	0.00E+00	2.70E-21	1.47E-20	1.10E-20	-1.67E-14
AP [kg SO_2-eq.]	1.25E-05	7.06E-08	2.51E-07	0.00E+00	1.80E-06	1.31E-08	2.00E-04	8.34E-07	0.00E+00	6.85E-08	6.15E-09	1.71E-08	-5.27E-06
EP [kg PO_4^{3-}-eq.]	7.41E-07	1.90E-08	6.16E-08	0.00E+00	3.93E-07	2.49E-09	1.81E-05	3.02E-06	0.00E+00	1.67E-08	5.69E-10	4.26E-09	-2.87E-07
*POCP [kg C_2H_4-eq.]	7.62E-07	-3.07E-08	-1.05E-07	0.00E+00	-5.60E-07	-3.01E-09	1.08E-05	9.63E-08	0.00E+00	-2.96E-08	5.06E-10	1.14E-09	-4.06E-07
ADPE [kg Sb-eq.]	2.40E-07	5.92E-12	2.81E-12	0.00E+00	3.05E-11	7.22E-11	4.08E-09	6.80E-11	0.00E+00	6.18E-13	1.49E-13	1.38E-13	-1.31E-07
ADPF [MJ]	2.84E-02	2.27E-04	1.13E-03	0.00E+00	9.00E-03	5.34E-05	5.56E-01	4.78E-03	0.00E+00	2.48E-04	1.87E-05	1.48E-05	-1.40E-02
Resource use	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE [MJ]	6.27E-03	1.10E-05	5.87E-06	0.00E+00	2.35E-04	2.89E-06	9.62E-02	1.47E-03	0.00E+00	8.23E-07	3.90E-06	2.60E-06	-1.48E-03
PERM [MJ]	8.40E-04	0.00E+00	-8.27E-04	0.00E+00	7.22E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.67E-05	0.00E+00	0.00E+00
PERT [MJ]	7.11E-03	1.10E-05	-8.21E-04	0.00E+00	3.08E-04	2.89E-06	9.62E-02	1.47E-03	0.00E+00	8.23E-07	-5.28E-05	2.60E-06	-1.48E-03
PENRE [MJ]	2.75E-02	2.71E-04	1.14E-03	0.00E+00	8.31E-03	4.26E-05	5.59E-01	5.85E-03	0.00E+00	2.50E-04	1.94E-05	8.51E-04	-1.46E-02
PENRM [MJ]	3.31E-03	0.00E+00	0.00E+00	0.00E+00	9.23E-04	1.26E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.35E-03	-8.34E-04	0.00E+00
PENRT [MJ]	3.08E-02	2.71E-04	1.14E-03	0.00E+00	9.23E-03	5.52E-05	5.59E-01	5.85E-03	0.00E+00	2.50E-04	-3.33E-03	1.64E-05	-1.46E-02
SM [kg]	7.23E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	1.24E-05	4.75E-08	2.15E-08	0.00E+00	4.42E-07	1.04E-08	2.74E-04	7.57E-04	0.00E+00	1.32E-09	1.18E-08	1.27E-07	-7.94E-06
Waste and output flows	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD [kg]	1.72E-10	2.28E-14	8.99E-15	0.00E+00	1.32E-12	3.20E-12	5.17E-11	1.15E-12	0.00E+00	1.72E-15	2.01E-15	3.24E-15	-8.90E-11
NHWD [kg]	3.29E-04	2.46E-08	2.33E-08	0.00E+00	4.48E-05	1.13E-07	1.48E-04	7.49E-04	0.00E+00	2.50E-08	6.75E-09	1.08E-05	-1.03E-04
RWD [kg]	6.00E-07	6.51E-10	1.90E-10	0.00E+00	4.76E-08	5.42E-10	1.03E-07	4.09E-07	0.00E+00	2.68E-10	1.91E-10	6.27E-10	-1.64E-07
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	3.13E-05	0.00E+00	5.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.75E-04	0.00E+00	0.00E+00
MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-06	0.00E+00	0.00E+00
EEE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.30E-05	0.00E+00
EET [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-04	0.00E+00

Table 7: Environmental impacts, HydroTap BC 240/175 in Australia

	Production	Distribution	Installation	Use Phase Emissions	Mainten-ance	Repair	Operational Energy	Operational Water	Waste Removal	Waste Transport	Waste Processing	Waste Disposal	Additional Info.
Environmental impact	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP [kg CO_2-eq.]	4.48E-03	2.15E-04	1.73E-04	5.86E-06	1.20E-03	6.70E-05	3.12E-02	7.22E-04	0.00E+00	3.80E-05	1.70E-04	1.22E-04	-2.64E-03
ODP [kg CFC11-eq.]	9.55E-13	3.05E-20	3.82E-20	0.00E+00	1.28E-16	4.74E-17	1.46E-15	6.12E-18	0.00E+00	5.67E-21	1.38E-18	2.42E-20	-3.58E-14
AP [kg SO_2-eq.]	2.67E-05	5.86E-06	5.21E-07	0.00E+00	3.74E-06	2.74E-08	4.58E-05	8.34E-07	0.00E+00	1.44E-07	4.63E-07	3.96E-08	-1.12E-05
EP [kg PO_4^{3-}-eq.]	1.57E-06	6.64E-07	1.26E-07	0.00E+00	8.03E-07	5.09E-09	6.35E-06	3.02E-06	0.00E+00	3.52E-08	4.43E-08	9.91E-09	-6.18E-07
*POCP [kg C_2H_4-eq.]	1.62E-06	2.83E-07	-2.18E-07	0.00E+00	-1.15E-06	-6.16E-09	4.67E-06	9.63E-08	0.00E+00	-6.23E-08	5.49E-08	2.63E-09	-8.65E-07
ADPE [kg Sb-eq.]	5.05E-07	1.19E-11	9.13E-12	0.00E+00	8.32E-11	1.51E-10	1.16E-08	6.80E-11	0.00E+00	1.30E-12	1.38E-11	3.07E-13	-2.73E-07
ADPF [MJ]	6.04E-02	2.62E-03	2.34E-03	0.00E+00	1.88E-02	1.11E-04	4.35E-01	4.78E-03	0.00E+00	5.23E-04	1.57E-03	3.31E-05	-3.02E-02
Resource use	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE [MJ]	1.34E-02	1.93E-05	1.62E-05	0.00E+00	5.25E-04	6.28E-06	3.75E-01	1.47E-03	0.00E+00	1.73E-06	3.91E-04	5.71E-06	-3.31E-03
PERM [MJ]	1.80E-03	0.00E+00	-1.77E-03	0.00E+00	1.55E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.22E-04	0.00E+00	0.00E+00
PERT [MJ]	1.52E-02	1.93E-05	-1.75E-03	0.00E+00	6.80E-04	6.28E-06	3.75E-01	1.47E-03	0.00E+00	1.73E-06	2.70E-04	5.71E-06	-3.31E-03
PENRE [MJ]	5.84E-02	2.68E-03	2.39E-03	0.00E+00	1.74E-02	8.89E-05	6.80E-01	5.85E-03	0.00E+00	5.26E-04	1.69E-03	1.87E-03	-3.15E-02
PENRM [MJ]	7.06E-03	0.00E+00	0.00E+00	0.00E+00	1.98E-03	2.70E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.10E-03	-1.83E-03	0.00E+00
PENRT [MJ]	6.55E-02	2.68E-03	2.39E-03	0.00E+00	1.94E-02	1.16E-04	6.80E-01	5.85E-03	0.00E+00	5.26E-04	-5.41E-03	3.66E-05	-3.15E-02
SM [kg]	1.55E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	2.64E-05	6.11E-08	3.61E-08	0.00E+00	8.81E-07	2.18E-08	2.19E-04	4.38E-04	0.00E+00	2.78E-09	1.22E-06	2.79E-07	-1.77E-05
Waste and output flows	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD [kg]	3.54E-10	4.15E-14	3.13E-14	0.00E+00	2.89E-12	6.57E-12	2.09E-10	1.15E-12	0.00E+00	3.62E-15	1.96E-13	7.28E-15	-1.91E-10
NHWD [kg]	6.89E-04	2.66E-07	6.91E-08	0.00E+00	9.60E-05	2.36E-07	6.85E-04	7.49E-04	0.00E+00	5.26E-08	7.33E-07	2.36E-05	-2.21E-04
RWD [kg]	1.29E-06	3.33E-09	2.97E-09	0.00E+00	1.17E-07	1.25E-09	9.88E-05	4.09E-07	0.00E+00	5.63E-10	3.44E-08	1.38E-09	-3.60E-07
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	6.71E-05	0.00E+00	1.18E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.78E-04	0.00E+00	0.00E+00
MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.03E-06	0.00E+00	0.00E+00
EEE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.79E-04	0.00E+00
EET [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.21E-04	0.00E+00

Table 8: Environmental impacts, HydroTap BC 160/125 in the UK

Table 9: Environmental impacts, HydroTap BC 240/175 in the UK

	Production	Distribution	Installation	Use Phase Emissions	Mainten-ance	Repair	Operational Energy	Operational Water	Waste Removal	Waste Transport	Waste Processing	Waste Disposal	Additional Info.
Environmental impact	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP [kg CO_2-eq.]	2.11E-03	1.01E-04	8.08E-05	3.19E-06	5.58E-04	3.59E-05	2.32E-02	7.22E-04	0.00E+00	1.81E-05	7.58E-06	5.54E-05	-1.23E-03
ODP [kg CFC11-eq.]	5.17E-13	1.43E-20	1.78E-20	0.00E+00	5.96E-17	2.32E-17	1.08E-15	6.12E-18	0.00E+00	2.70E-21	2.12E-20	1.10E-20	-1.67E-14
AP [kg SO_2-eq.]	1.25E-05	2.75E-06	2.42E-07	0.00E+00	1.75E-06	1.29E-08	3.39E-05	8.34E-07	0.00E+00	6.85E-08	3.12E-09	1.71E-08	-5.27E-06
EP [kg PO_4^{3-}-eq.]	7.41E-07	3.12E-07	5.85E-08	0.00E+00	3.75E-07	2.38E-09	4.71E-06	3.02E-06	0.00E+00	1.67E-08	3.16E-10	4.26E-09	-2.87E-07
*POCP [kg C_2H_4-eq.]	7.62E-07	1.33E-07	-1.01E-07	0.00E+00	-5.35E-07	-2.87E-09	3.46E-06	9.63E-08	0.00E+00	-2.96E-08	3.62E-10	1.14E-09	-4.06E-07
ADPE [kg Sb-eq.]	2.40E-07	5.59E-12	4.21E-12	0.00E+00	3.88E-11	7.22E-11	8.63E-09	6.80E-11	0.00E+00	6.18E-13	1.85E-13	1.38E-13	-1.31E-07
ADPF [MJ]	2.84E-02	1.23E-03	1.09E-03	0.00E+00	8.78E-03	5.21E-05	3.23E-01	4.78E-03	0.00E+00	2.48E-04	1.31E-05	1.48E-05	-1.40E-02
Resource use	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE [MJ]	6.27E-03	9.05E-06	7.49E-06	0.00E+00	2.45E-04	2.94E-06	2.78E-01	1.47E-03	0.00E+00	8.23E-07	5.66E-06	2.60E-06	-1.48E-03
PERM [MJ]	8.40E-04	0.00E+00	-8.27E-04	0.00E+00	7.22E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.67E-05	0.00E+00	0.00E+00
PERT [MJ]	7.11E-03	9.05E-06	-8.19E-04	0.00E+00	3.17E-04	2.94E-06	2.78E-01	1.47E-03	0.00E+00	8.23E-07	-5.11E-05	2.60E-06	-1.48E-03
PENRE [MJ]	2.75E-02	1.26E-03	1.11E-03	0.00E+00	8.14E-03	4.16E-05	5.04E-01	5.85E-03	0.00E+00	2.50E-04	1.60E-05	8.51E-04	-1.46E-02
PENRM [MJ]	3.31E-03	0.00E+00	0.00E+00	0.00E+00	9.23E-04	1.26E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.35E-03	-8.34E-04	0.00E+00
PENRT [MJ]	3.08E-02	1.26E-03	1.11E-03	0.00E+00	9.06E-03	5.42E-05	5.04E-01	5.85E-03	0.00E+00	2.50E-04	-3.33E-03	1.64E-05	-1.46E-02
SM [kg]	7.23E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW [m^3]	1.24E-05	2.87E-08	1.64E-08	0.00E+00	4.11E-07	1.02E-08	1.63E-04	4.38E-04	0.00E+00	1.32E-09	9.09E-09	1.27E-07	-7.94E-06
Waste and output flows	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD [kg]	1.72E-10	1.95E-14	1.44E-14	0.00E+00	1.35E-12	3.20E-12	1.55E-10	1.15E-12	0.00E+00	1.72E-15	3.03E-15	3.24E-15	-8.90E-11
NHWD [kg]	3.29E-04	1.25E-07	3.20E-08	0.00E+00	4.48E-05	1.13E-07	5.08E-04	7.49E-04	0.00E+00	2.50E-08	1.05E-08	1.08E-05	-1.03E-04
RWD [kg]	6.00E-07	1.56E-09	1.38E-09	0.00E+00	5.48E-08	5.83E-10	7.32E-05	4.09E-07	0.00E+00	2.68E-10	1.09E-09	6.27E-10	-1.64E-07
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR [kg]	3.13E-05	0.00E+00	5.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.75E-04	0.00E+00	0.00E+00
MER [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-06	0.00E+00	0.00E+00
EEE [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.30E-05	0.00E+00
EET [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.49E-04	0.00E+00

*Negative values for POCP are due to nitrogen monoxide (NO) emissions, primarily from transport. NO can reduce ground-level ozone and therefore has a negative characterisation factor in EN 15804:2012+A1:2013.

REFERENCES

ABS. (2013). Data by Region. Retrieved from Australian Bureau of Statistics: http://stat.abs.gov.au/itt/r.jsp?databyregion

ABS. (2014). Australian Health Survey: Nutrition First Results – Foods and Nutrients. Retrieved from Australian Bureau of Statistics: http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/4364.0.55.007~2011-12~Main%20Features~Non-alcoholic%20beverages~701

Australian Government. (2015). National Inventory Report 2013: Volume 2. Australian National Greenhouse Accounts. Canberra: Commonwealth of Australia.

Defra. (2012).Waste water treatment in the United Kingdom – 2012. London: Department for Environment, Food and Rural Affairs.

EN 12900:2013. Refrigerant compressors. Rating conditions, tolerances and presentation of manufacturer's performance data. Brussels: European Committee for Standardization.

EN 15804:2012+A1:2013. Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products. Brussels: European Committee for Standardization.

IEPDS (2021). Product category rules and PCR basic module: Construction products and Construction services. The International EPD System, PCR 2012:01, version 2.34.

Forsythe, P. (2007). Office buildings - The importance of "make good", fitout and recurring embodied energy. Sydney: Faculty of Design Architecture and Building, University of Technology Sydney.

German Institute for Standardization. (2007). DIN 18599:2007. Energy performance of buildings – Calculation of the net, final and primary energy demand for heating, cooling, ventilation, hot water and lighting – Part 8: Net and final energy demand for water heating systems. German Institute for Standardization.

IMB. (2011). Consumer Trends: Hot Drinks in the United Kingdom. Retrieved from International Markets Bureau: http://www5.agr.gc.ca/resources/prod/Internet-Internet/MISB-DGSIM/ATS-SEA/PDF/5742-eng.pdf

ISO 14025:2006. Environmental labels and declarations — Type III environmental declarations — Principles and procedures. Geneva: International Organization for Standardization.

ISO 14040:2006. Environmental management – Life cycle assessment – Principles and framework. Geneva: International Organization for Standardization.

ISO 14044:2006. Environmental management – Life cycle assessment – Requirements and guidelines. Geneva: International Organization for Standardization.

Lewis, S. L., Dirksen, S. R., Heitkemper, M. M., & Bucher, L. (2014). Medical-surgical nursing: assessment and management of clinical problems (9th ed.). St. Louis: Moseby.

Sphera (2021). GaBi Databases 2021. Leinfelden-Echterdingen, Germany: Sphera Solutions, Inc. Available: https://gabi.sphera.com/international/databases/gabi-databases/

SUPPLEMENTARY DOCUMENT

WATER AND ENERGY USE CALCULATIONS (MODULE B)

Calculation of the energy and water demand for each appliance, and other declared metrics given in Table 4 have been calculated according to the methods described in the supplementary document, available on request.

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