Product Environmental Profile





Eaton 9PX/SX 8/11kVA Gen2

Representative product	Eaton 9PX8KIRTNG2 Product Category: Uninterruptible Power Systems (UPS) with energy storage
Description of the product	Eaton 9PX/SX 8/11kVA Gen2 is a compact UPS designed to protect mission-critical applications. Thanks to the use of new power electronics components (Silicon Carbide) 9PX/SX Gen 2 is providing the highest level of energy efficiency, in a very compact 4U form factor. Typical applications include protection of the IT infrastructure, Medical equipment, Control systems.
Product specifications	Power VA: 8000VA / 8000W UPS Configuration: Single UPS with Bypass UPS performance classification: UPS - VFI ⩽ 10kW (Online double conversion) Technology of the energy storage system: Valve regulated lead acid batteries (VRLA) Product dimensions (H*W*D) : 174*440*725 mm Mass of the equipment: 8.02E+01 kg (Unit - 7.75E+01 kg + Accessory - 2.77E+0 kg) Power factor: 1 Reference service life (Years) for all models: 10
Homogeneous Environmental Families Covered	The PEP concerns product offerings from Eaton - 9PX 8-11KI Gen2 as mentioned below, DC is double conversion mode, HE is high efficiency mode.

Product Family	Product Number	Mode	Power (W)	Backup time (min)	UPS efficiency (%)	Packaging mass (kg)	Product mass (kg)
Eaton 9PX/SX 8/11kVA Gen2	9PX8KIRTNG2 (Reference)	DC	8000	5.4	97.31%	1.65E+01	8.02E+01
	9PX8KIRTNG2	HE	8000	5.4	99.53%	1.65E+01	8.02E+01
	9PX11KIRTNG2 (Homogeneous 1)	DC	11000	3.1	97.13%	1.65E+01	8.02E+01
	9PX11KIRTNG2 (Homogeneous 1)	HE	11000	3.1	99.45%	1.65E+01	8.02E+01
	9SX8KIG2 (Homogeneous 2)	DC	8000	3.5	97.38%	1.65E+01	8.02E+01
	9SX8KIG2 (Homogeneous 2)	HE	8000	3.5	99.53%	1.65E+01	8.02E+01
	9SX11KIG2 (Homogeneous 3)	DC	11000	1.9	97.33%	1.65E+01	8.02E+01
	9SX11KIG2 (Homogeneous 3)	HE	11000	1.9	99.45%	1.65E+01	8.02E+01
	9SX8KIRT4UG2 (Homogeneous 4)	DC	8000	3.5	97.38%	1.65E+01	8.02E+01

	9SX8KIRT4UG2 (Homogeneous 4)	HE	8000	3.5	99.53%	1.65E+01	8.02E+01
	9SX11KIRT4UG2 (Homogeneous 5)	DC	11000	1.9	97.33%	1.65E+01	8.02E+01
	9SX11KIRT4UG2 (Homogeneous 5)	HE	11000	1.9	99.45%	1.65E+01	8.02E+01
	9PX8KIRTNG2 + 9PXEBM240RT3UG2 (Homogeneous 6)	DC	8000	15.2	97.31%	2.74E+01	1.45E+02
	9PX8KIRTNG2 + 9PXEBM240RT3UG2 (Homogeneous 6)	HE	8000	15.2	99.53%	2.74E+01	1.45E+02
	9PX8KIRTNG2 + 2*9PXEBM240RT3UG2 (Homogeneous 7)	DC	8000	26.7	97.31%	3.83E+01	2.10E+02
	9PX8KIRTNG2 + 2*9PXEBM240RT3UG2 (Homogeneous 7)	HE	8000	26.7	99.53%	3.83E+01	2.10E+02
	9PX8KIRTNG2 + 4*9PXEBM240RT3UG2 (Homogeneous 8)	DC	8000	50.9	97.31%	6.00E+01	3.40E+02
	9PX8KIRTNG2 + 4*9PXEBM240RT3UG2 (Homogeneous 8)	HE	8000	50.9	99.53%	6.00E+01	3.40E+02
	9PX8KIRTNG2 + 12*9PXEBM240RT3UG2 (Homogeneous 9)	DC	8000	151.0	97.31%	1.47E+02	8.61E+02
	9PX8KIRTNG2 + 12*9PXEBM240RT3UG2 (Homogeneous 9)	HE	8000	151.0	99.53%	1.47E+02	8.61E+02
	9PX8KIRTNG2 + MBP11KIG2 (Homogeneous 10)	DC	8000	5.4	97.31%	1.88E+01	8.22E+01
	9PX8KIRTNG2 + MBP11KIG2 (Homogeneous 10)	HE	8000	5.4	99.53%	1.88E+01	8.22E+01
	9SX8KIG2 + 1*9SXEBM240G2 (Homogeneous 11)	DC	8000	3.5	97.31%	2.74E+01	1.45E+02
	9SX8KIG2 + 1*9SXEBM240G2 (Homogeneous 11)	HE	8000	3.5	99.53%	2.74E+01	1.45E+02
	9SX8KIRT4UG2 + 1*9SXEBM240RT3UG2 (Homogeneous 12)	DC	8000	10.6	97.38%	2.74E+01	1.45E+02
	9SX8KIRT4UG2 + 1*9SXEBM240RT3UG2 (Homogeneous 12)	HE	8000	10.6	99.53%	2.74E+01	1.45E+02

Functional unit	To ensure the supply of power without interruption to equipment with load of 100 watts for a RSL of 1 years, including a backup time capacity of 5 minutes during power shortages
Declared unit	To ensure the supply of power without interruption to equipment with load of 8000 watts for a RSL of 10 years, including a backup time capacity of 5.4 minutes (at full load condition) during power shortages
Company information	Eaton Industries (France) SAS 110 Rue Blaise Pascal 38330 Montbonnot Saint Martin France Email: productstewardship-es@eaton.com

Constituent Materials of Reference Product:	9.67E+01 kg (with packaging)		
Materials	**Category PEP Material**	**Mass (kg)**	**Percentage (%)**
Other	Lead acid battery	5.00E+01	51.7%
Metal	Steel	1.91E+01	19.7%
Other	Cardboard	9.01E+00	9.3%
Other	Wood	4.38E+00	4.5%
Plastic	Polyethylene	2.46E+00	2.5%

Other	Cable	1.48E+00	1.5%
Other	PWB	1.34E+00	1.3%
Other	Inductor	1.14E+00	1.1%
Other	Capacitor	1.08E+00	1.1%
Metal	Aluminum	8.78E-01	0.9%
Plastic	Acrylonitrile Butadiene Styrene	6.73E-01	0.7%
Plastic	Polyvinyl chloride	6.20E-01	0.6%
Other	Inductor	6.15E-01	0.6%
Other	Paper	6.21E-01	0.6%
Other	Relay	3.78E-01	0.3%
Other	Miscellaneous	2.90E+00	3.0%
Total		9.67E+01	100.0%

Substance Assessment
The representative product is compliant with the EU-RoHS Directive (2011/65/EU) by application of exemptions and the product contains lead (Pb) in batteries, copper alloy and electronics, which is listed as Substance-of-Very-High-Concern (SVHC) on the Candidate List of the EU-REACH Regulation (1907/2006/EC).

Additional Environmental Information	
Manufacturing	The reference product is assembled at an Eaton plant (LianZheng Electronic (ShenZhen) Co., Ltd.) holding management system certifications according to ISO 14001 standards.
Distribution	Eaton is committed to minimizing weight and volume of product and its associated packaging material with focus to optimize transport efficiency.
Installation	During installation of the product only standard tools are needed, which do not require any additional energy source and no waste other than the obsolete product packaging is generated during this step.
Use	Product consumes energy during useful life which is considered to be 10 years (as per actual designed life). During the reference service life of product, product requires one battery replacement for maintenance.
End of life	The recyclability rate of the overall product is 71.95% if properly dismantled prior to further processing at a recycling facility. The rate is calculated based on "ECO'DEEE recyclability and recoverability calculation method" (version V1, 20 Sep. 2008 presented to the French Agency for Environment and Energy Management: ADEME).

Environmental Impacts	
The calculation of the environmental impacts is the result of the Product's Life Cycle Analysis in accordance with ISO 14040/44, covering the entire lifecycle, i.e., "Cradle-to-Grave" including the following life cycle phases: production, distribution, installation, use and end of life. System modelling was carried out using the commercial LCA software EIME v6.2.4 with database version CODDE-2024-04 - updated on 2024-06-04. Indicators Set used: PEF EF 3.1 (Compliance: PEP ed.4, EN15804+A2) v2.0	
Manufacturing Phase	Product is assembled and prepared for shipment at the Eaton facility, Lianzheng Electronic (Shenzhen) Co., Ltd. Energy model used: Europe, China, Global
Distribution Phase	Since Europe is the major market for the product, following transport scenario is considered for the product from Shenzhen, China Eaton plant to end user for this study. As per PCR 4 (section 2.5.3), 19000km is considered by sea and 1000km by road.
Installation Phase	Product is installed in any European country. Hence, packaging waste treatment is considered in this phase considering country specific statistics as per PSR. Energy model used: Europe

<table>
<tr><td>Use Phase</td><td>Reference lifetime: 10 years
Energy model used: Europe.
Usage profile: It has an average energy efficiency of 97.31%. The methodology for the calculation of the electricity consumption is based on Uninterruptible Power Systems (UPS) PSR.
<table><tr><td>Operating loads</td><td>25%</td><td>50%</td><td>75%</td><td>100%</td></tr><tr><td>Proportion of Time spent at</td><td>0.00</td><td>0.30</td><td>0.40</td><td>0.30</td></tr></table>Total energy losses are calculated to be equal to 14054.54 kWh over the 10 years.</td></tr>
<tr><td>End of life Phase</td><td>Product disposed according to European WEEE guidelines.
Energy model used: Europe</td></tr>
<tr><td>Module-D</td><td>Module D is calculated according to PCR-ed4-EN-2021 09 06 based on the materials recycled and the modelled end-of-life scenario.
It expresses the net benefits and loads beyond the boundaries of the system and are not to be included in the life cycle totals.</td></tr>
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Environmental Impact considering for Declared Unit

Environmental Impact Indicators: Mandatory

Mandatory environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Climate change - total	kg CO_2 eq.	5.85E+03	5.49E+02	3.10E+01	3.48E+01	5.12E+03	1.09E+02	1.70E+02	4.95E+03		-2.69E+02
Climate change - fossil fuels	kg CO_2 eq.	5.84E+03	5.68E+02	3.10E+01	1.55E+01	5.11E+03	1.08E+02	1.70E+02	4.94E+03		-2.80E+02
Climate change - biogenics	kg CO_2 eq.	9.29E+00	-1.94E+01	0.00E+00	1.93E+01	9.12E+00	3.45E-01	2.39E-04	9.12E+00		1.01E+01
Climate change - land use and land use transformation	kg CO_2 eq.	1.87E-05	1.81E-05	0.00E+00	0.00E+00	0.00E+00	5.77E-07	0.00E+00	0.00E+00		-9.73E-07
Ozone depletion	kg eq. CFC-11	9.19E-04	8.42E-04	4.08E-08	2.84E-07	6.90E-05	6.84E-06	4.50E-05	2.40E-05		-7.26E-05
Acidification (AP)	mole of H+ eq.	3.25E+01	3.90E+00	1.03E+00	3.93E-02	2.70E+01	5.52E-01	1.61E+00	2.54E+01		-2.89E+00
Freshwater eutrophication	kg P eq.	1.65E-02	1.48E-03	1.07E-05	1.37E-04	1.39E-02	1.02E-03	8.67E-04	1.30E-02		-4.38E-02
Marine aquatic eutrophication	kg of N eq.	4.14E+00	4.69E-01	2.45E-01	1.45E-02	3.30E+00	1.15E-01	2.06E-01	3.09E+00		-3.50E-01
Terrestrial eutrophication	mole of N eq.	6.06E+01	5.04E+00	2.69E+00	1.14E-01	5.19E+01	7.92E-01	2.27E+00	4.97E+01		-3.80E+00
Photochemical ozone formation	kg of NMVOC eq.	1.32E+01	1.71E+00	6.92E-01	2.61E-02	1.05E+01	2.64E-01	7.35E-01	9.73E+00		-1.26E+00
Depletion of abiotic resources - elements	kg eq. Sb	4.78E-01	2.56E-01	1.11E-06	4.70E-07	2.22E-01	3.15E-05	2.20E-01	1.75E-03		-3.78E-01
Depletion of abiotic resources - fossil fuels	MJ	1.41E+05	8.65E+03	3.95E+02	1.17E+02	1.28E+05	4.01E+03	3.27E+03	1.25E+05		-7.91E+03

Water scarcity	m^3 of eq. deprivation worldwide	1.54E+03	1.78E+02	1.03E-01	3.05E+00	4.41E+02	9.14E+02	6.18E+01	3.79E+02		-3.63E+03

*__Note__: B2 (Maintenance) and B6 (energy requirements during the use stage) are considered. Other sub modules in the use stage (B1, B3-B5, B7) are equal to zero. So, it is not listed in the result tables.

Inventory Flow Indicators: Mandatory

Inventory flow indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	3.33E+04	1.33E+02	5.06E-01	5.12E+01	3.31E+04	6.29E+00	4.76E+00	3.31E+04		7.54E+00
Use of renewable primary energy resources used as raw materials	MJ	2.67E+02	2.67E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		-1.61E+02
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	3.36E+04	4.00E+02	5.06E-01	5.12E+01	3.31E+04	6.29E+00	4.76E+00	3.31E+04		-1.54E+02
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	1.41E+05	8.29E+03	3.95E+02	1.17E+02	1.28E+05	4.01E+03	3.19E+03	1.25E+05		-7.71E+03
Use of non-renewable primary energy resources used as raw materials	MJ	4.42E+02	3.57E+02	0.00E+00	0.00E+00	8.50E+01	0.00E+00	8.50E+01	0.00E+00		-1.98E+02
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	1.41E+05	8.65E+03	3.95E+02	1.17E+02	1.28E+05	4.01E+03	3.27E+03	1.25E+05		-7.91E+03
Use of secondary materials	kg	4.79E-02	4.79E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Use of renewable secondary fuels	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
Use of non-renewable secondary fuels	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
Net use of fresh water	m3	3.89E+01	4.15E+00	2.40E-03	1.17E-01	1.04E+01	2.43E+01	1.44E+00	8.92E+00		-8.49E+01
Hazardous waste disposed of	kg	6.35E+02	1.51E+02	0.00E+00	2.63E-01	3.30E+02	1.53E+02	1.13E+02	2.17E+02		-1.77E+01

Non-hazardous waste disposed of	kg	1.13E+03	2.27E+02	9.55E-01	9.69E+00	8.64E+02	2.89E+01	2.72E+01	8.36E+02		-2.64E+01
Radioactive waste disposed of	kg	2.73E-01	7.00E-02	6.65E-04	8.49E-04	1.98E-01	3.61E-03	5.60E-03	1.92E-01		-2.02E-02
Components for re-use	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
Materials for recycling	kg	2.85E+01	6.16E-05	0.00E+00	1.02E+01	0.00E+00	1.83E+01	0.00E+00	0.00E+00		0.00E+00
Materials for energy recovery	kg	8.24E+00	6.14E+00	0.00E+00	0.00E+00	0.00E+00	2.10E+00	0.00E+00	0.00E+00		0.00E+00
Exported energy	MJ by energy vector	2.47E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-02	0.00E+00	0.00E+00		0.00E+00
Biogenic carbon content of the product	kg of C.	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
Biogenic carbon content of the associated packaging	kg of C.	6.13E+00	6.13E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00

*__Note__: B2 (Maintenance) and B6 (energy requirements during the use stage) are considered. Other sub modules in the use stage (B1, B3-B5, B7) are equal to zero. So, it is not listed in the result tables.

Environmental Impact Indicators: Optional

Optional Environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Emission of fine particles	incidence of diseases	2.44E-04	2.26E-05	5.45E-06	2.29E-07	2.13E-04	2.85E-06	8.52E-06	2.04E-04		-1.37E-05
Ionizing radiation, human health	kBq of U235 eq.	1.16E+04	3.81E+03	6.48E-02	6.11E+02	7.13E+03	3.57E+01	9.14E+00	7.12E+03		-6.54E+01
Ecotoxicity, fresh water	CTUe	1.49E+05	7.55E+03	1.86E+01	1.39E+02	7.56E+04	6.55E+04	6.62E+04	9.36E+03		-3.74E+03
Human toxicity, cancer effects	CTUh	2.10E-05	6.05E-06	4.66E-10	1.09E-06	7.72E-06	6.14E-06	7.10E-06	6.23E-07		-4.24E-06
Human toxicity, non-cancer effects	CTUh	4.84E-04	2.39E-04	1.03E-08	3.79E-08	2.44E-04	1.88E-06	2.29E-04	1.49E-05		-3.96E-04
Impacts related to land use/soil quality	-	1.50E+02	1.32E+00	0.00E+00	2.40E-02	1.37E+02	1.11E+01	0.00E+00	1.37E+02		-3.74E+01
Total use of primary energy during the life cycle	MJ	1.75E+05	9.05E+03	3.95E+02	1.68E+02	1.61E+05	4.02E+03	3.28E+03	1.58E+05		-8.06E+03

*__Note__: B2 (Maintenance) and B6 (energy requirements during the use stage) are considered. Other sub modules in the use stage (B1, B3-B5, B7) are equal to zero. So, it is not listed in the result tables.

All environmental impacts are calculated for the declared unit, then data should be divided by the Factor calculated with below formulas to get functional unit result.

Factor for use stage energy consumption B6:

$$\frac{Declared\ Unit\ Power\ (8000\ W) * Declared\ Unit\ Lifetime\ (10\ year)}{100\ W * 1\ year} = \mathbf{800}$$

Factor for all other stages (excepted B6 of use stage):

$$\frac{Declared\ Unit\ Power\ (8000\ W) * Declared\ Unit\ Lifetime\ (10\ year) * Declared\ Unit\ Backuptime\ (5.4\ min)}{100\ W * 1\ year * 5\ min} = \mathbf{864}$$

Environmental Impact for Functional Unit

Environmental Impact Indicators: Mandatory

Mandatory environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Climate change - total	kg CO_2 eq.	7.23E+00	6.35E-01	3.59E-02	4.03E-02	6.39E+00	1.26E-01	1.97E-01	6.19E+00		-3.12E-01
Climate change - fossil fuels	kg CO_2 eq.	7.21E+00	6.58E-01	3.59E-02	1.80E-02	6.38E+00	1.25E-01	1.97E-01	6.18E+00		-3.24E-01
Climate change - biogenics	kg CO_2 eq.	1.16E-02	-2.25E-02	0.00E+00	2.23E-02	1.14E-02	4.00E-04	2.77E-07	1.14E-02		1.17E-02
Climate change - land use and land use transformation	kg CO_2 eq.	2.17E-08	2.10E-08	0.00E+00	0.00E+00	0.00E+00	6.68E-10	0.00E+00	0.00E+00		-1.13E-09
Ozone depletion	kg eq. CFC-11	1.07E-06	9.75E-07	4.72E-11	3.29E-10	8.20E-08	7.92E-09	5.20E-08	3.00E-08		-8.41E-08
Acidification (AP)	mole of H+ eq.	4.00E-02	4.51E-03	1.19E-03	4.55E-05	3.36E-02	6.39E-04	1.87E-03	3.17E-02		-3.34E-03
Freshwater eutrophication	kg P eq.	2.04E-05	1.71E-06	1.24E-08	1.59E-07	1.73E-05	1.18E-06	1.00E-06	1.63E-05		-5.07E-05
Marine aquatic eutrophication	kg of N eq.	5.08E-03	5.43E-04	2.84E-04	1.67E-05	4.10E-03	1.33E-04	2.39E-04	3.86E-03		-4.05E-04
Terrestrial eutrophication	mole of N eq.	7.47E-02	5.84E-03	3.11E-03	1.32E-04	6.47E-02	9.17E-04	2.62E-03	6.21E-02		-4.40E-03
Photochemical ozone formation	kg of NMVOC eq.	1.61E-02	1.98E-03	8.01E-04	3.02E-05	1.30E-02	3.06E-04	8.50E-04	1.22E-02		-1.45E-03
Depletion of abiotic resources - elements	kg eq. Sb	5.54E-04	2.97E-04	1.29E-09	5.44E-10	2.57E-04	3.64E-08	2.55E-04	2.19E-06		-4.38E-04
Depletion of abiotic resources - fossil fuels	MJ	1.75E+02	1.00E+01	4.57E-01	1.35E-01	1.60E+02	4.65E+00	3.79E+00	1.56E+02		-9.15E+00
Water scarcity	m^3 of eq. deprivation worldwide	1.81E+00	2.06E-01	1.19E-04	3.54E-03	5.46E-01	1.06E+00	7.15E-02	4.74E-01		-4.20E+00

*__Note__: B2 (Maintenance) and B6 (energy requirements during the use stage) are considered. Other sub modules in the use stage (B1, B3-B5, B7) are equal to zero. So, it is not listed in the result tables.

Inventory Flow Indicators: Mandatory

Inventory flow indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	4.16E+01	1.54E-01	5.86E-04	5.93E-02	4.14E+01	7.28E-03	5.50E-03	4.14E+01		8.72E-03
Use of renewable primary energy resources used as raw materials	MJ	3.09E-01	3.09E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		-1.87E-01
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	4.19E+01	4.63E-01	5.86E-04	5.93E-02	4.14E+01	7.28E-03	5.50E-03	4.14E+01		-1.78E-01
Use of non-renewable primary energy, excluding non-renewable primary energy resources used as raw materials	MJ	1.75E+02	9.60E+00	4.57E-01	1.35E-01	1.60E+02	4.65E+00	3.69E+00	1.56E+02		-8.92E+00
Use of non-renewable primary energy resources used as raw materials	MJ	5.12E-01	4.14E-01	0.00E+00	0.00E+00	9.84E-02	0.00E+00	9.84E-02	0.00E+00		-2.29E-01
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	1.75E+02	1.00E+01	4.57E-01	1.35E-01	1.60E+02	4.65E+00	3.79E+00	1.56E+02		-9.15E+00
Use of secondary materials	kg	5.55E-05	5.55E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Use of renewable secondary fuels	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
Use of non-renewable secondary fuels	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
Net use of fresh water	m3	4.59E-02	4.80E-03	2.77E-06	1.35E-04	1.28E-02	2.81E-02	1.66E-03	1.11E-02		-9.82E-02
Hazardous waste disposed of	kg	7.55E-01	1.75E-01	0.00E+00	3.04E-04	4.02E-01	1.78E-01	1.31E-01	2.71E-01		-2.05E-02
Non-hazardous waste disposed of	kg	1.39E+00	2.63E-01	1.11E-03	1.12E-02	1.08E+00	3.34E-02	3.15E-02	1.05E+00		-3.06E-02
Radioactive waste disposed of	kg	3.33E-04	8.10E-05	7.69E-07	9.83E-07	2.46E-04	4.18E-06	6.48E-06	2.40E-04		-2.34E-05

Components for re-use	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
Materials for recycling	kg	3.30E-02	7.13E-08	0.00E+00	1.19E-02	0.00E+00	2.12E-02	0.00E+00	0.00E+00		0.00E+00
Materials for energy recovery	kg	9.54E-03	7.11E-03	0.00E+00	0.00E+00	0.00E+00	2.43E-03	0.00E+00	0.00E+00		0.00E+00
Exported energy	MJ by energy vector	2.86E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.86E-05	0.00E+00	0.00E+00		0.00E+00
Biogenic carbon content of the product	kg of C.	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
Biogenic carbon content of the associated packaging	kg of C.	7.09E-03	7.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		0.00E+00

*__Note__: B2 (Maintenance) and B6 (energy requirements during the use stage) are considered. Other sub modules in the use stage (B1, B3-B5, B7) are equal to zero. So, it is not listed in the result tables.

Environmental Impact Indicators: Optional

Optional Environmental impact indicators	Units	Sum	A1-A3 - Manufacturing	A4 - Distribution	A5 - Installation	B1-B7 - Use	C1-C4 - End of life	B2 - Maintenance	B6 - Operational energy use		D - Benefits and loads beyond the system boundaries
Emission of fine particles	incidence of diseases	3.01E-07	2.62E-08	6.31E-09	2.66E-10	2.65E-07	3.30E-09	9.87E-09	2.55E-07		-1.59E-08
Ionizing radiation, human health	kBq of U235 eq.	1.41E+01	4.41E+00	7.50E-05	7.08E-01	8.91E+00	4.13E-02	1.06E-02	8.90E+00		-7.57E-02
Ecotoxicity, fresh water	CTUe	1.73E+02	8.74E+00	2.16E-02	1.61E-01	8.83E+01	7.58E+01	7.67E+01	1.17E+01		-4.33E+00
Human toxicity, cancer effects	CTUh	2.44E-08	7.00E-09	5.39E-13	1.26E-09	9.00E-09	7.11E-09	8.22E-09	7.79E-10		-4.90E-09
Human toxicity, non-cancer effects	CTUh	5.62E-07	2.76E-07	1.19E-11	4.39E-11	2.83E-07	2.17E-09	2.65E-07	1.86E-08		-4.58E-07
Impacts related to land use/soil quality	-	1.86E-01	1.53E-03	0.00E+00	2.78E-05	1.71E-01	1.29E-02	0.00E+00	1.71E-01		-4.33E-02
Total use of primary energy during the life cycle	MJ	2.17E+02	1.05E+01	4.58E-01	1.94E-01	2.01E+02	4.65E+00	3.79E+00	1.98E+02		-9.33E+00

*__Note__: B2 (Maintenance) and B6 (energy requirements during the use stage) are considered. Other sub modules in the use stage (B1, B3-B5, B7) are equal to zero. So, it is not listed in the result tables.

To evaluate the environmental impact of other product covered by this PEP, apply the following conversion factors to the Environmental Impact shown above. The extrapolation factors are calculated based on the PSR 10 section 3.6.:

Conversion Factors for Manufacturing, Distribution, Installation, Maintenance and End-of-Life Phase for all environmental impact of declared unit:

Part No.	Mandatory environmental impact indicators	GWP	GWP-b	GWP-f	GWP-lu	ODP	AP	EP-fw	EP-m	EP-t	POCP	ADP-e	ADP-f	WDP
9PX8KIRTNG2 (Reference)	A1-A3 - Manufacturing	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A4 - Distribution	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A5 - Installation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	C1-C4 - End of life	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	B2 - Maintenance	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	D - Benefits and loads beyond the system boundaries	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9PX11KIRTNG2 (Homogeneous 1)	A1-A3 - Manufacturing	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A4 - Distribution	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A5 - Installation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	C1-C4 - End of life	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	B2 - Maintenance	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	D - Benefits and loads beyond the system boundaries	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9SX8KIG2 (Homogeneous 2)	A1-A3 - Manufacturing	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A4 - Distribution	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A5 - Installation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	C1-C4 - End of life	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	B2 - Maintenance	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	D - Benefits and loads beyond the system boundaries	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9SX11KIG2 (Homogeneous 3)	A1-A3 - Manufacturing	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A4 - Distribution	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A5 - Installation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	C1-C4 - End of life	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	B2 - Maintenance	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	D - Benefits and loads beyond the system boundaries	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9SX8KIRT4UG2 (Homogeneous 4)	A1-A3 - Manufacturing	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A4 - Distribution	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A5 - Installation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	C1-C4 - End of life	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	B2 - Maintenance	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	D - Benefits and loads beyond the system boundaries	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9SX11KIRT4UG2 (Homogeneous 5)	A1-A3 - Manufacturing	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A4 - Distribution	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	A5 - Installation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

	C1-C4 - End of life	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	B2 - Maintenance	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	D - Benefits and loads beyond the system boundaries	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9PX8KIRTNG2 + 9PXEBM240RT3UG2 (Homogeneous 6)	A1-A3 - Manufacturing	1.38	1.38	1.58	1.28	1.06	1.46	1.61	1.53	1.53	1.51	1.87	1.47	1.57
	A4 - Distribution	1.78	1.78	1.00	1.00	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78
	A5 - Installation	1.66	1.71	1.61	1.00	1.33	1.56	1.58	1.58	1.59	1.58	1.35	1.60	1.47
	C1-C4 - End of life	1.75	1.76	1.10	1.91	1.76	1.73	2.19	1.42	1.69	1.69	2.25	1.66	1.05
	B2 - Maintenance	2.00	2.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	D - Benefits and loads beyond the system boundaries	1.89	1.88	1.59	2.00	1.98	1.87	1.42	1.91	1.91	1.91	2.00	1.83	1.42
9PX8KIRTNG2 + 2*9PXEBM240RT3UG2 (Homogeneous 7)	A1-A3 - Manufacturing	1.75	1.76	2.16	1.56	1.11	1.93	2.22	2.05	2.05	2.03	2.73	1.94	2.13
	A4 - Distribution	2.56	2.56	1.00	1.00	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56
	A5 - Installation	2.31	2.43	2.22	1.00	1.66	2.12	2.17	2.17	2.18	2.15	1.70	2.19	1.95
	C1-C4 - End of life	2.51	2.51	1.21	2.82	2.53	2.46	3.38	1.83	2.37	2.37	3.51	2.32	1.10
	B2 - Maintenance	3.00	3.00	3.00	1.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	D - Benefits and loads beyond the system boundaries	2.78	2.76	2.18	3.00	2.96	2.75	1.84	2.82	2.82	2.83	3.00	2.65	1.84
9PX8KIRTNG2 + 4*9PXEBM240RT3UG2 (Homogeneous 8)	A1-A3 - Manufacturing	2.50	2.53	3.32	2.13	1.23	2.86	3.45	3.10	3.11	3.06	4.47	2.88	3.27
	A4 - Distribution	4.12	4.12	1.00	1.00	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12	4.12
	A5 - Installation	3.62	3.86	3.44	1.00	2.32	3.25	3.34	3.34	3.37	3.31	2.41	3.38	2.90
	C1-C4 - End of life	4.01	4.02	1.42	4.64	4.05	3.91	5.76	2.66	3.75	3.75	6.01	3.63	1.20
	B2 - Maintenance	5.00	5.00	5.00	1.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
	D - Benefits and loads beyond the system boundaries	4.57	4.52	3.36	5.00	4.92	4.49	2.68	4.65	4.64	4.65	4.99	4.30	2.68
9PX8KIRTNG2 + 12*9PXEBM240RT3UG2 (Homogeneous 9)	A1-A3 - Manufacturing	5.50	5.59	7.97	4.38	1.68	6.57	8.34	7.31	7.32	7.18	11.41	6.63	7.81
	A4 - Distribution	10.36	10.36	1.00	1.00	10.36	10.36	10.36	10.36	10.36	10.36	10.36	10.36	10.36
	A5 - Installation	8.87	9.57	8.31	1.00	4.95	7.75	8.02	8.01	8.11	7.92	5.22	8.14	6.69
	C1-C4 - End of life	10.04	10.07	2.26	11.93	10.15	9.74	15.27	5.99	9.24	9.25	16.04	8.90	1.61
	B2 - Maintenance	13.00	13.00	13.00	1.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00	13.00
	D - Benefits and loads beyond the system boundaries	11.70	11.57	8.08	13.00	12.77	11.48	6.05	11.94	11.92	11.96	12.98	10.91	6.05
9PX8KIRTNG2 + MBP11KIG2 (Homogeneous 10)	A1-A3 - Manufacturing	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
	A4 - Distribution	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
	A5 - Installation	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13
	C1-C4 - End of life	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	B2 - Maintenance	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
	D - Benefits and loads beyond the system boundaries	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
9SX8KIG2 + 1*9SXEBM240G2 (Homogeneous 11)	A1-A3 - Manufacturing	1.38	1.38	1.58	1.28	1.06	1.46	1.61	1.53	1.53	1.51	1.87	1.47	1.57
	A4 - Distribution	1.78	1.78	1.00	1.00	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78
	A5 - Installation	1.66	1.71	1.61	1.00	1.33	1.56	1.58	1.58	1.59	1.58	1.35	1.60	1.47
	C1-C4 - End of life	1.75	1.76	1.10	1.91	1.76	1.73	2.19	1.42	1.69	1.69	2.25	1.66	1.05
	B2 - Maintenance	2.00	2.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	D - Benefits and loads beyond the system boundaries	1.89	1.88	1.59	2.00	1.98	1.87	1.42	1.91	1.91	1.91	2.00	1.83	1.42

9SX8KIRT4UG2 + 1*9SXEBM240RT 3UG2 (Homogeneous 12)	A1-A3 - Manufacturing	1.38	1.38	1.58	1.28	1.06	1.46	1.61	1.53	1.53	1.51	1.87	1.47	1.57
	A4 - Distribution	1.78	1.78	1.00	1.00	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78
	A5 - Installation	1.66	1.71	1.61	1.00	1.33	1.56	1.58	1.58	1.59	1.58	1.35	1.60	1.47
	C1-C4 - End of life	1.75	1.76	1.10	1.91	1.76	1.73	2.19	1.42	1.69	1.69	2.25	1.66	1.05
	B2 - Maintenance	2.00	2.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
	D - Benefits and loads beyond the system boundaries	1.89	1.88	1.59	2.00	1.98	1.87	1.42	1.91	1.91	1.91	2.00	1.83	1.42

Conversion Factors for Use Phase (Energy Consumption) for all environmental impact of declared unit:

Part No.	Mode	Use Phase Extrapolation Factors	Electricity Consumption (kWh)
9PX8KIRTNG2 (Reference model)	DC	1.00	14054.54
	HE	0.15	2165.47
9PX11KIRTNG2 (Homogeneous 1)	DC	1.49	20943.85
	HE	0.27	3859.22
9SX8KIG2 (Homogeneous 2)	DC	0.97	13697.14
	HE	0.15	2165.47
9SX11KIG2 (Homogeneous 3)	DC	1.40	19614.08
	HE	0.27	3859.22
9SX8KIRT4UG2 (Homogeneous 4)	DC	0.97	13697.14
	HE	0.15	2165.47
9SX11KIRT4UG2 (Homogeneous 5)	DC	1.40	19614.08
	HE	0.27	3859.22
9PX8KIRTNG2 + 9PXEBM240RT3UG2 (Homogeneous 6)	DC	1.00	14054.54
	HE	0.15	2165.47
9PX8KIRTNG2 + 2*9PXEBM240RT3UG2 (Homogeneous 7)	DC	1.00	14054.54
	HE	0.15	2165.47
9PX8KIRTNG2 + 4*9PXEBM240RT3UG2 (Homogeneous 8)	DC	1.00	14054.54
	HE	0.15	2165.47
9PX8KIRTNG2 + 12*9PXEBM240RT3UG2 (Homogeneous 9)	DC	1.00	14054.54
	HE	0.15	2165.47
9PX8KIRTNG2 + MBP11KIG2 (Homogeneous 10)	DC	1.00	14054.54
	HE	0.15	2165.47
9SX8KIG2 + 1*9SXEBM240G2 (Homogeneous 11)	DC	0.97	13697.14
	HE	0.15	2165.47
9SX8KIRT4UG2 + 1*9SXEBM240RT3UG2 (Homogeneous 12)	DC	0.97	13697.14
	HE	0.15	2165.47

Above extrapolation factor needs to be multiplied to declared unit environmental impacts. To get functional unit impacts, the declared unit results of specific product number need to be divided by below factors calculated as per PSR10 section 3.1.3. Below Table represents both DC and HE mode for each product number as the Back-up time remains same for both the modes.

Products	FU factor for other phases (Excluding B6)	FU factor for Use B6
9PX8KIRTNG2 (Reference model)	864.00	800
9PX11KIRTNG2	682.00	1100
9SX8KIG2	560.00	800
9SX11KIG2	418.00	1100
9SX8KIRT4UG2	560.00	800
9SX11KIRT4UG2	418.00	1100
9PX8KIRTNG2 + 9PXEBM240RT3UG2	2432.00	800
9PX8KIRTNG2 + 2*9PXEBM240RT3UG2	4272.00	800
9PX8KIRTNG2 + 4*9PXEBM240RT3UG2	8144.00	800
9PX8KIRTNG2 + 12*9PXEBM240RT3UG2	24160.00	800
9PX8KIRTNG2 + MBP11KIG2	864.00	800
9SX8KIG2 + 1*9SXEBM240G2	560.00	800
9SX8KIRT4UG2 + 1*9SXEBM240RT3UG2	1696.00	800

Disclaimer

This Product Environmental Profile and its content is based on information available to us. It refers to the product at the date of issue. We make no express or implied representations or warranties with respect to the information contained herein.

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		Validity period	5 years
Independent verification of the declaration and data, in compliance with ISO 14025: 2006			
Internal	X	External	
The PCR review was conducted by a panel of experts chaired by Julie ORGELET (DDemain)			
PEPs are compliant with XP C08-100-1:2016 or EN 50693:2019 *The components of the present PEP may not be compared with components from any other program.*			
Document complies with ISO 14025:2006 "Environmental labels and declarations. Type III environmental declarations"			