ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration Forbo Flooring BV

Programme holder Institut Bauen und Umwelt e.V. (IBU

Publisher Institut Bauen und Umwelt e.V. (IBU)

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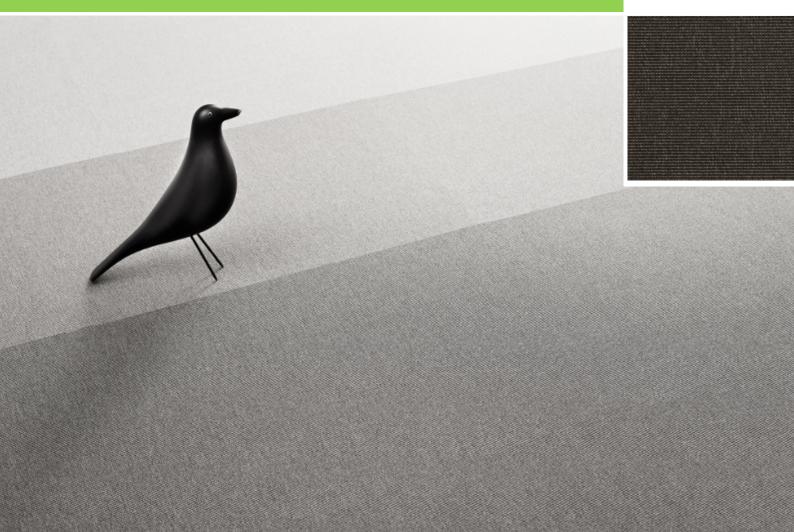
Forbo Peace woven broadloom carpet

pile material polyamide 6.6, aqueous dyeing method, total pile weight 550 g/m²

Forbo Flooring Systems

Institut Bauen und Umwelt e.V.

www.ibu-epd.com / https://epd-online.com





General Information

Forbo Flooring Systems Woven broadloom carpet pile material PA 6.6, total pile weight 550 g/m² Programme holder Owner of the declaration IBU - Institut Bauen und Umwelt e.V. Forbo Flooring BV, Panoramastr. 1 P.O. Box 13, 10178 Berlin 1560 AA Krommenie Germany Netherlands Declared product / declared unit **Declaration number** EPD-FOR-20170126-CBA1-EN 1 m² woven broadloom carpet having a pile material of polyamide 6.6 This declaration is based on the product Scope: category rules: The manufacturer declaration applies to a product with a total pile weight of 550 g/m². Floor coverings, 02/2018 (PCR checked and approved by the SVR) The carpet is woven in an external manufacturing site Bording, Denmark and it is dyed, precoated and back coated externally, Bording, Denmark. Issue date The declaration is only valid in conjunction with a valid 11.04.2017 GUT-/PRODIS/ license of the product. Valid to The owner of the declaration shall be liable for the 10.04.2022 underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. Verification Wermanes The standard /EN 15804/ serves as the core PCR Independent verification of the declaration and data according to /ISO 14025:2010/ Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.) internally externally

Product

Dr. Burkhart Lehmann

(Managing Director IBU)

Product description / Product definition

Forbo Peace flat woven broadloom carpet having a pile material of polyamide 6.6 and a woven textile backing made of polyester with recycled content. The carpet is colored by a continuous dyeing method. The LCA results are calculated for a product with a total pile weight of 550 g/m².

For the placing on the market of the product in the EU/EFTA (with the exception of Switzerland) Regulation (EU) No. 305/2011 /CPR/ applies. The Declaration of Performance of the products taking into consideration /EN 14041/ and the CE-marking of the products can be found on the manufacturer's technical information section.

Application

Angela Schindler

(Independent verifier appointed by SVR)

According to the use class as defined in /EN 1307/ the products can be used in all professional area which require class 33 or less.





Technical Data

Name	Value	Unit
Product Form	broadloom carpet	-
Type of manufacture	flat woven	1
Yarn type	PA 6.6	ı
Secondary backing	Textile backing made of polyester with recycled content	-
Total pile weight	550	g/m²
Total carpet weight	2150	g/m²

Additional product properties in accordance with /EN 1307/ and performance data of the product in accordance with the Declaration of Performance with respect to its Essential Characteristics according to /EN 14041/ can be found on the Product Information System /PRODIS/ using the /PRODIS/ registration number of the product (www.pro-dis.info) or on the manufacturer's technical information section https://www.forbo.com/.

Base materials / Ancillary materials

Name	Value	Unit
Polyamide 6.6	26.7	%
Polyester	17.0	%
Polypropylene	2.1	%
Limestone	18.8	%
Aluminium hydroxide	18.9	%
Acrylic ester	15.3	%
Glass fibre	0.7	%
Additives	0.5	%

The products are registered in the GUT-/PRODIS/ Information System. The /PRODIS/ system ensures the compliance with limitations of various chemicals and VOC-emissions and a ban on use of all substances that are listed as 'Substances of Very High Concern' (SVHC) under /REACH/.

Reference service life

A calculation of the reference service life according to /ISO 15686/ is not possible.

The service life of textile floor coverings strongly depends on the correct installation taking into account the declared use classification and the adherence to cleaning and maintenance instructions.

A minimum service life of 10 years can be assumed, technical service life can be considerably longer.

LCA: Calculation rules

Declared Unit

Name	Value	Unit
Declared unit	1	m ²
Conversion factor to 1 kg	0.47	-
Mass reference	2.15	kg/m²

The declared unit refers to 1 m² produced textile floor covering. Output of module A5 'Assembly' is 1 m² installed textile floor covering.

System boundary

Type of EPD: Cradle-to-grave

System boundaries of modules A, B, C, D:

A1-A3 Production:

Energy supply and production of the basic material, processing of secondary material, auxiliary material, transport of the material to the manufacturing site, emissions, waste water treatment, packaging material and waste processing up to the landfill disposal of residual waste (except radioactive waste). Benefits for generated electricity and steam due to the incineration of production waste are aggregated.

A4 Transport:

Transport of the packed textile floor covering from factory gate to the place of installation.

A5 Installation:

Installation of the textile floor covering, processing of installation waste and packaging waste up to the landfill disposal of residual waste (except radioactive waste), the production of the amount of carpet that occurs as installation waste including its transport to the place of installation.

Generated electricity and steam due to the incineration of waste are listed in the result table as exported energy.

Preparing of the floor and auxiliary materials (adhesives, fixing agents, PET connectors) are beyond the system boundaries and not taken into account.

B1 Use:

Indoor emissions during the use stage. After the first year, no product related VOC emissions are relevant due to known VOC decay curves of the product.

B2 Maintenance:

Cleaning of the textile floor covering for a period of 1 year:

Vacuum cleaning – electricity supply
Wet cleaning – electricity, water consumption,
production of the cleaning agent, waste water

The declared values in this module have to be multiplied by the assumed service life of the floor



covering in the building in question (see annex, chapter 'General information on use stage').

B3 - B7:

The modules are not relevant and therefore not declared.

C1 De-construction:

The floor covering is de-constructed manually and no additional environmental impact is caused.

C2 Transport:

Transport of the carpet waste to a landfill, to the municipal waste incineration plant (MWI) or to the waste collection facility for recycling.

C3 Waste processing:

C3-1: Landfill disposal need no waste processing.

C3-2: Impact from waste incineration (plant with

R1>0.6), generated electricity and steam are listed in the result table as exported energy.

C3-3: Collection of the carpet waste, waste processing (granulating).

C4 Disposal

C4-1: Impact from landfill disposal,

C4-2: The carpet waste leaves the system in

module C3-2,

C4-3: The pre-processed carpet waste leaves the system in module C3-3

D Recycling potential:

D-A5: Benefits for generated energy due to incineration of packaging and installation waste (incineration plant with R1 > 0.6),

D-1: Benefits for generated energy due to landfill disposal of carpet waste at the end-of-life,

D-2: Benefits for generated energy due to incineration of carpet waste at the end-of-life (incineration plant with R1 > 0.6),

D-3: Benefits for saved fossil energy and saved inorganic material due to recovery of the carpet in a cement plant at the end-of-life, transport from the reprocessing plant to the cement kiln.

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

Background data are taken from the /GaBi database 2017/, service pack 33 and from the /ecoinvent 3.3/ database.

LCA: Scenarios and additional technical information

The following information refer to the declared modules and are the basis for calculations or can be used for further calculations.

Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel (truck, EURO 0-5 mix)	0.0043	l/100km
Transport distance	700	km
Capacity utilisation (including empty runs)	85	%

Installation in the building (A5)

Name	Value	Unit
Material loss	0.2	kg

Packaging waste and installation waste are considered to be incinerated in a municipal waste incineration plant.

Preparation of the floor and auxiliaries (adhesives, fixing agents, PET connectors, etc.) are not taken into account.

Maintenance (B2)

Indication per m² floor covering and per year (see annex, chapter 'General Information on use stage')

Name	Value	Unit
Maintenance cycle (wet cleaning)	1.5	1/year
Maintenance cycle (vacuum cleaning)	208	1/year
Water consumption (wet cleaning)	0.004	m³
Cleaning agent (wet cleaning)	0.09	kg
Electricity consumption	0.314	kWh

Further information on cleaning and maintenance see www.forbo.com

End of Life (C1-C4)

Three different end-of-life scenarios are declared and the results are indicated separately in module C. Each scenario is calculated as a 100% scenario.

Scenario 1: 100% landfill disposal

Scenario 2: 100% municipal waste incineration (MWI) with R1>0.6

Scenario 3: 100% recycling in the cement industry

If combinations of these scenarios have to be calculated this should be done according to the following scheme:

EOL-impact = x% impact (Scenario 1)

+ y% impact (Scenario 2)

+ z% impact (Scenario 3)



Name	Value	Unit		
Collected as mixed construction	2.15	kg		
waste (scenario 1 and 2)	2.15	ĸy		
Collected separately (scenario 3)	2.15	kg		
Landfilling (scenario 1)	2.15	kg		
Energy recovery (scenario 2)	2.15	kg		
Energy recovery (scenario 3)	1.32	kg		
Recycling (scenario 3)	0.83	kg		

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Recovery or recycling potentials due to the three endof-life scenarios (module C) are indicated separately.

Recycling in the cement industry (scenario 3)

The organic material of the carpet is used as secondary fuel in a cement kiln. It mainly substitutes for lignite (61.9%), hard coal (26.8%) and petrol coke (11.3%).

The inorganic material is substantially integrated in the cement clinker and substitutes for original material input



LCA: Results

The declared result figures in module B2 have to be multiplied by the assumed service life (in years) of the floor covering in the building under consideration (see annex, chapter 'General Information on use stage').

Information on un-declared modules:

Modules B3 - B7 are not relevant during the service life of the carpet and are therefore not declared. Modules C1, C3/1 and C4/2 cause no additional impact (see "LCA: Calculation rules") and are therefore not declared. Module C2 represents the transport for scenarios 1, 2 and 3. Column D represents module D/A5. The CML characterisation factors version April 2015 are applied.

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Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-	Recycling- potential
A1	A2	А3	A4	A5	В1	B2	В3	B4	B5	В6	В7	C1	C2	C3	3 C4		D
X	Х	Х	X	X	Х	Х	MNR	MNR	MNR	MND	MND	MND	Χ	X	X		Χ
RESU	LTS	OF TH	IE LC/	4 - EN\	/IRONI	/ENT	AL IM	PAC	T: 1 m²	floorc	overin	g					
Param eter	Ur	nit	A1-A3	A4	A5	B ^r	ı	B2	C2	C3/2	C3/3	C4/1		D	D/1	D/2	D/3
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	[kg ethe		2.27E-3					.62E-4	-8.57E-6	1.22E-4	2.42E-				0.00E+0	-1.71E-4	
ADDE			7.37E-6		_				4.02E-10			_			0.00E+0	-2.20E-7	-2.48E-7
Caption	GWF	P = Glob ophication	ADPF [MJ] 1.90E+2 1.23E+0 1.70E+1 0.00E+0 6.89E+0 6.90E-2 1.35E+0 1.41E-1 2.21E+0 -2.59E+0 0.00E+0 -1.62E+1 -4.05E+1 GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP =														
RESUL	LTS		1F I C <i>l</i>	4 - RFS	SOURC	F USF	: 1 m	1² floc									
Paramet			A1-A3	A - RES A4	A5	E USE B1		n² floo	C2		C3/3	C4/1	D)	D/1	D/2	D/3
	ter L	Jnit	A1-A3			B1	E	32	C2	ring			D			D/2 -2.90E+0	D/3
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Peramet Pere Perm Pert Penre Penre Penre Penre SM RSF	ter L [1] [1] [2] [3] [4] [7] [7] [7] [8] [9] [9] [9]	MJ 2 MJ C M	A1-A3 2.79E+1 0.00E+0 2.79E+1 1.66E+2 3.62E+1 2.02E+2 9.21E-2 0.00E+0 0.00E+0 4.63E-2	6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 0.00E+0 0.00E+0 1.15E-4	A5 2.48E+0 0.00E+0 2.48E+0 1.81E+1 0.00E+0 1.81E-1 8.11E-3 0.00E+0 0.00E+0 5.21E-3	B1 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+	0 9.88 0 0.00 0 9.8 0 8.05 0 0.00 0 8.05 0 0.00 0 0.00 0 0.00 0 0.00 0 4.2	32	C2 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 6.92E-2 0.00E+0 0.00E+0 0.00E+0 0.00E+0 6.43E-6	C3/2 1.78E-1 0.00E+0 1.78E-1 3.77E+1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 0.00E+0 8.88E-3	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 2.32E-1 0.00E+0 0.00E+0 0.00E+0 1.13E-4	1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 2.30E+ 0.00E+ 0.00E+ 5.50E-	D	E+0 E+0	0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0	-2.90E+0 0.00E+0 -2.90E+0 -1.95E+1 0.00E+0 -1.95E+1 0.00E+0 0.00E+0 -4.15E-3	-3.91E-1 0.00E+0 -3.91E-1 -4.09E+1 0.00E+0 -4.09E+1 8.26E-1 0.00E+0 3.82E+1 -3.89E-3
Paramet PERE PERM PERT PENRE PENRI PENRI SM RSF FW Caption	ter L I III E III T III T III F	Jnit	A1-A3 2.79E+1 2.00E+0 2.79E+1 1.66E+2 3.62E+1 2.02E+2 9.21E-2 0.00E+0 0.00E+0 1.00E	A4 6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 0.00E+0 1.15E-4 enewable nergy res imary en nergy res al; RSF =	A5 2.48E+0 0.00E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 0.00E+0 5.21E-3 primary 6 ources us ergy exclisiources us Use of re	B1 0.00E+ under 0.00E+ nergy ead as reuding nosed as renewable	0 9.88 0 0.00 0 9.8 0 8.05 0 0.00 0 8.05 0 0.00 0 0.00 0 4.23 excludir aw mate	7E-1 0E+0 (7E-1 0E+0 0E+0 (7E-1 0E+0 0E+0 0E+0 0E+0 (7E-1 0E+0 0E+0 0E+0 0E+0 0E+0 0E+0 0E+0 0E+	C2 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 0.0	1.78E-1 0.00E+0 1.78E-1 3.77E+1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 8.88E-3 imary enerotal use energy reserved to the server of the	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non-re	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ s.50E- urces usable prirused as renewable	1 -4.71 0 0.000 1 -4.71 0 -3.13 0 0.000 0 -3.13 0 0.000 0 0.000 6 -6.72 sed as ramary en	E+0	0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 eaterials; I	-2.90E+0 0.00E+0 -2.90E+0 -1.95E+1 0.00E+0 -1.95E+1 0.00E+0 0.00E+0 0.00E+0 4.15E-3 PERM = USe of ources; \$	-3.91E-1 -0.00E+0 -3.91E-1 -4.09E+1 -0.00E+0 -4.09E+1 -8.26E-1 -0.00E+0 -3.89E-3 -3.
Paramet PERE PERM PERT PENRE PENRI PENRI SM RSF FW Caption	ter L [I] [I] [I] [I] [I] [I] [I] [I	Jnit MJ 2 MJ 2 MJ 2 MJ 1 MJ 1 MJ 2 kg 9 MJ (m²) 4 ERE = 1 condary OF TH	A1-A3 2.79E+1 0.00E+0 2.79E+1 1.66E+2 3.62E+1 2.02E+2 9.21E-2 0.00E+0 0.00E+0 4.63E-2 Use of rerimary erwable purimary ery material	A4 6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 0.00E+0 1.15E-4 enewable nergy res imary en nergy res al; RSF =	A5 2.48E+0 0.00E+0 2.48E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 0.00E+0 5.21E-3 primary eources usergy exclisiources usergy exclisiources usergy exclisiources usergy exclisiources usergy exclisiources usergy exclisio	B1 0.00E+ under 0.00E+ nergy ead as reuding nosed as renewable	0 9.88 0 0.00 0 9.8 0 8.05 0 0.00 0 8.05 0 0.00 0 0.00 0 4.23 excludir aw mate	7E-1 0E+0 (7E-1 0E+0 0E+0 (7E-1 0E+0 0E+0 0E+0 0E+0 (7E-1 0E+0 0E+0 0E+0 0E+0 0E+0 0E+0 0E+0 0E+	C2 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 0.0	1.78E-1 0.00E+0 1.78E-1 3.77E+1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 8.88E-3 imary enerotal use energy reserved to the server of the	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non-re	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ s.50E- urces usable prirused as renewable	1 -4.71 0 0.000 1 -4.71 0 -3.13 0 0.000 0 -3.13 0 0.000 0 0.000 6 -6.72 sed as ramary en	E+0	0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 eaterials; I	-2.90E+0 0.00E+0 -2.90E+0 -1.95E+1 0.00E+0 -1.95E+1 0.00E+0 0.00E+0 0.00E+0 4.15E-3 PERM = USe of ources; \$	-3.91E-1 -3.91E-1 -4.09E+1 -4.09E+1 -4.09E+1 -4.09E+1 -8.26E-1 -9.00E+0 -9.28E-1 -9.28E
Paramet PERE PERM PENT PENRI PENRI SM RSF NRSF FW Caption	ter L i [i]	Jnit	A1-A3 2.79E+1 0.00E+0 2.79E+1 1.66E+2 3.62E+1 2.02E+2 9.21E-2 0.00E+0 0.00E+0 4.63E-2 Use of rerimary erwable purimary ery material	A4 6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 0.00E+0 1.15E-4 enewable nergy res imary en nergy res al; RSF =	A5 2.48E+0 0.00E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 0.00E+0 5.21E-3 primary 6 ources us ergy exclisiources us Use of re	B1 0.00E+ under 0.00E+ nergy ead as reuding nosed as renewable	B	7E-1 0E+0 (7E-1 0E+0 0E+0 (7E-1 0E+0 0E+0 0E+0 0E+0 (7E-1 0E+0 0E+0 0E+0 0E+0 0E+0 0E+0 0E+0 0E+	C2 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 0.0	1.78E-1 0.00E+0 1.78E-1 3.77E+1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 8.88E-3 imary enerotal use energy reserved to the server of the	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non-re	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ s.50E- urces usable prirused as renewable	1 -4.71 0 0.000 1 -4.71 0 -3.13 0 0.000 0 -3.13 0 0.000 0 0.000 6 -6.72 sed as ramary en	E-1 E+0 E+0	0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 eaterials; I	-2.90E+0 0.00E+0 -2.90E+0 -1.95E+1 0.00E+0 -1.95E+1 0.00E+0 0.00E+0 0.00E+0 4.15E-3 PERM = USe of ources; \$	-3.91E-1 -3.91E-1 -4.09E+1 -4.09E+1 -4.09E+1 -4.09E+1 -8.26E-1 -9.00E+0 -9.28E-1 -9.28E
Paramet PERE PERM PERT PENRI PENRI SM RSF NRSF FW Caption RESUI 1 m² fl	ter L [I] [I] [I] [I] [I] [I] [I] [I	Jnit MJ 2 MJ 2 MJ 2 MJ 3 MJ 3 MJ 2 kg 9 MJ 0 m³ 4 vable pron-rene wable prondary OF Theoverity	A1-A3 2.79E+1 0.00E+0 2.79E+1 1.66E+2 2.079E+1 1.66E+2 0.00E+0 0.00E+0 4.63E-2 0.00E+0	A4 6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 1.00E+0 1.15E-4 enewable energy res rimary en nergy res	A5 2.48E+0 0.00E+0 2.48E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 5.21E-3 primary 6 ources us ergy exclusources us Use of re	B1 0.00E+	E E E E E E E E E E	32 7E-1 10E+0 (10E+0 (C2 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 0.0	C3/2 1.78E-1 0.00E+0 1.78E-1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 energy energy reserved as the server	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 2.32E-1 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non of non-re	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 0.0	1 4.71 0 0.000 1 -4.71 0 -3.13 0 0.000 0 -3.13 0 0.000 0 0.000 0 0.000 6 -6.72 sed as raw mat ble prime e second	IE-1 IE-1 IE-1 IE-1 IE-1 IE-1 IE-1 IE-1	0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 esources; PENRN nergy resuels; FW	-2.90E+0 0.00E+0 -2.90E+0 -1.95E+1 0.00E+0 -1.95E+1 0.00E+0 0.00E+0 4.15E-3 PERM = Use of	-3.91E-1 -3.91E-1 -4.09E+1 -4.09E+1 -4.09E+1 -4.09E+1 -8.20E-1 -9.00E+0 -9.389E-3 -9.389E-
Paramete PERE PERM PERT PENRI PENRI SM RSF NRSF FW Caption RESUI 1 m² fl Paramete HWD NHWD	ter L [I] [I] [E] [M] [I] [I] [I] [I] [I] [I] [I	Jnit	A1-A3 2.79E+1 0.00E+0 2.79E+1 1.66E+2 2.079E+1 1.66E+2 3.62E+1 2.02E+2 9.21E-2 0.00E+0 0.00E+0 4.63E-2 USe of regroup of regroup of the primary equivalent of the primary equi	6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 1.00E+0 1.15E-4 enewable energy res rimary en nergy res al; RSF = 6.50E-8 9.46E-5	A5 2.48E+0 0.00E+0 2.48E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 5.21E-3 primary 6 ources us ergy exclusources us Use of re TPUT F A5 2.60E-6 6.88E-2	B1 0.00E+	E E C C C C C C C C	7E-1	C2 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 EVALUATE OF THE PERT = 1 primary e PENRT = 1 primary e PENRT = 2 Lels; NRS wate C2 3.63E-9 5.29E-6	1.78E-1 0.00E+0 1.78E-1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 ATEGO C3/2 6.66E-9 4.23E-1	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 2.32E-1 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non of non-re C3/3 9.42E-11 1.53E-4	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 0.00E+ 0.00E+ 5.50E- urces usable prinused as- renewalenewable C4/1 8.88E- 2.14E+	D 1 -4.71 0 0.000 1 -4.71 0 0.000 0 -3.13 0 0.000 0 0.000 0 0.000 0 0.000 6 -6.72 sed as ramary en raw mat ble prime e second	E-10	0.00E+0	-2.90E+0 0.00E+0 -2.90E+0 -1.95E+1 0.00E+0 -1.95E+1 0.00E+0 0.00E+0 4.15E-3 PERM = Use of by 2 -4.71E-9 -6.89E-3	-3.91E-1 -0.00E+0 -3.91E-1 -4.09E+1 -0.00E+0 -4.09E+1 -0.00E+0 -3.89E-3 -1.93E-3 -3.95E-9 -1.93E-1
Paramete PERE PERM PERT PENRI PENRI SM RSF NRSF FW Caption RESUL 1 m² fl Paramete HWD NHWD RWD	ter L i [i]	Jnit	A1-A3 2.79E+1 0.00E+0 2.79E+1 1.66E+2 2.02E+2 9.21E-2 0.00E+0 0.00E+0 4.63E-2 Use of remany equivalent equival	A4 6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 0.00E+0 1.15E-4 enewable energy res rimary en nergy res 4 — OU A4 6.50E-8 9.46E-5 1.69E-6	A5 2.48E+0 0.00E+0 2.48E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 0.00E+0 5.21E-3 primary 6 ources us use ergy exclisiources us Use of re TPUT F A5 2.60E-6 6.88E-2 4.32E-4	B1 0.00E+	E E E E E E E E E E	7E-1	C2 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 E-2 0.00E+0 E-3 0.00E+0 E-4 0.00E+0 E-4 0.00E+0 E-4 0.00E+0 E-5 0.00E+0 E-6 0.00E+0	C3/2 1.78E-1 0.00E+0 1.78E-1 3.77E+1 3.77E+1 1.51E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 Energy reserved as a served as a	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non-re C3/3 9.42E-11 1.53E-4 3.62E-5	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 0.00E+ 0.00E+ 5.50E- urces us able prii used as -renewa enewable C4/1 8.88E- 2.14E+ 3.48E-	D 1 -4.71 0 0.000 1 -4.71 0 0.000 1 -3.13 0 0.000 0 0.000 0 0.000 6 -6.72 sed as ramary en- raw mat ble prime a second	E-10 E-10 E-10 E-10 E-10 E-10 E-10 E-10	0.00E+0	-2.90E+0 0.00E+0 -2.90E+0 -1.95E+1 0.00E+0 0.00E+0 0.00E+0 0.00E+0 4.15E-3 PERM = Use of D/2 4.71E-9 -6.89E-3 -1.33E-3	3.91E-1 0.00E+0 -3.91E-1 4.09E+1 0.00E+0 4.09E+1 4.09E+1 -3.89E-3 Jse of = Use of fnon- SM = Use net fresh D/3 -3.05E-9 -1.93E-1 -1.42E-4
Paramete PERE PERM PERT PENRI PENRI SM RSF NRSF FW Caption RESUI 1 m² fl Paramete HWD NHWD	ter L [E [[I] M [[I] T [[I] T [I] F [I]	Jnit	A1-A3 2.79E+1 0.00E+0 2.79E+1 1.66E+2 2.02E+2 9.21E-2 0.00E+0 0.00E+0 4.63E-2 Use of remany equivalent equival	6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 1.00E+0 1.15E-4 enewable energy res rimary en nergy res al; RSF = 6.50E-8 9.46E-5	A5 2.48E+0 0.00E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 0.00E+0 0.00E+0 5.21E-3 primary 6 ources us ergy excl sources us Use of re TPUT F A5 2.60E-6 6.88E-2 4.32E-4 0.00E+0	B1 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ Energy 6 Sed as rauding no sed as ranewable LOWS B1 0.00E+	E E E E E E E E E E	7E-1 : 0E+0 (0F-1) : 0E+0 (0F-	C2 3.47E-3 0.00E+0 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 6.92E-2 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 EWABLE PIPERT = T PIPIMARY & WATE VALUE OF THE CALL C2 3.63E-9 5.29E-6 9.44E-8 0.00E+0	1.78E-1 0.00E+0 1.78E-1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 ATEGO C3/2 6.66E-9 4.23E-1	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 2.32E-1 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non of non-re C3/3 9.42E-11 1.53E-4	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 0.00E+ 5.50E- urces usable pringed as- renewable C4/1 8.88E- 2.14E+ 3.48E- 0.00E+	D	E-10 E-10 E-10 E-10 E-10 E-10 E-10 E-10	0.00E+0	-2.90E+0 0.00E+0 -2.90E+0 -1.95E+1 0.00E+0 -1.95E+1 0.00E+0 0.00E+0 4.15E-3 PERM = Use of by 2 -4.71E-9 -6.89E-3	-3.91E-1 -0.00E+0 -3.91E-1 -4.09E+1 -0.00E+0 -4.09E+1 -0.00E+0 -3.89E-3 -1.93E-1
Paramet PERE PERM PERT PENRE PENRE PENRE PENRE PENRE PENRE PENRE RSF NRSF FW Caption RESUIT 1 m² fl Paramet HWD NHWD RWD CRU MFR MER	ter L [I] [I] [I] [I] [I] [I] [I] [I	Jnit	A1-A3 2.79E+1 0.00E+0 0.79E+1 1.66E+2 2.79E+1 1.66E+2 3.62E+1 2.02E+2 9.21E-2 0.00E+0 0.00E+0 0.00E+0 1.00E+0	A4 6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 0.00E+0 1.15E-4 enewable nergy res rimary en nergy res sil; RSF = 4 — OU A4 6.50E-8 9.46E-5 1.69E-6 0.00E+0 0.00E+0 0.00E+0	A5 2.48E+0 0.00E+0 2.48E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 5.21E-3 primary e ources us ergy excliources us Use of re TPUT F A5 2.60E-6 6.88E-2 4.32E-4 0.00E+0 0.224E-3 0.00E+0	B1 0.00E+ Energy end as ranged as	E E E E E E E E E E	32 7E-1 0E+0 0E+0 0E+0 0E+0 0E+0 0E+0 0E+0 0E+	C2 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 0.0	ring C3/2 1.78E-1 0.00E+0 1.78E-1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 Energy reservations ATEGO C3/2 6.66E-9 4.23E-1 6.31E-5 0.00E+0 0.00E+0	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non of non-re C3/3 9.42E-11 1.53E-4 3.62E-5 0.00E+0 8.26E-1 1.32E+0	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+	D	E-10	0.00E+0	-2.90E+0 -0.00E+0 -1.95E+1 -0.00E+0 -1.95E+1 -0.00E+0 -0.00E+0 -0.00E+0 -1.95ERM = Use of	-3.91E-1 -0.00E+0 -3.91E-1 -4.09E+1 -0.00E+0 -4.09E+1 -8.26E-1 -0.00E+0 -3.89E-3 -3.89E-3 -3.89E-3 -3.05E-9 -1.93E-1 -1.42E-4 -0.00E+0 -0.00E+0 -0.00E+0
Paramet PERE PERM PERT PENRE PENRE PENRE PENRE PENRE PENRE PENRE RSF NRSF FW Caption RESU 1 m² fl Paramet HWD NHWE RWD CRU MFR MER EEE	ter L [I] [I] [E] [M] [I] [I] [I] [I] [I] [I] [I	Jnit	A1-A3 2.79E+1 0.00E+0 2.79E+1 1.66E+2 3.62E+1 2.02E+2 9.21E-2 0.00E+0 0.00E+0 1.00E+0	A4 6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 0.00E+0 1.15E-4 enewable nergy res rimary en nergy res al; RSF = 4 - OU A4 6.50E-8 9.46E-5 1.69E-6 0.00E+0 0.00E+0 0.00E+0 0.00E+0	A5 2.48E+0 0.00E+0 2.48E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 5.21E-3 primary 6 ources us ergy exclusiources us Use of re TPUT F A5 2.60E-6 6.88E-2 4.32E-4 0.00E+0 0.00E+0 6.16E-1	B1 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ Energy e Ed as rauding no sed as ranewable ELOWS B1 0.00E+	E E C C C C C C C C	7E-1	C2 3.47E-3 0.00E+0 3.47E-3 6.92E-2 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 C2 3.63E-9 PERT = 1 primary e PENRT = uels; NRS wate ASTE C C2 3.63E-9 9.44E-8 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0	C3/2 1.78E-1 0.00E+0 1.78E-1 3.62E+1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 6.66E-3 4.23E-1 6.31E-5 0.00E+0	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non of non-re C3/3 9.42E-11 1.53E-4 3.62E-5 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 0.00E+ 0.00E+ 5.50E- urces usable prinused as renewable 2.14E+ 3.48E- 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+	D 1 -4.71 0 0.000 1 -4.71 0 0.000 1 -4.71 0 0.000 0 -3.13 0 0.000 0 0.000 0 0.000 6 -6.72 6 -6.72 6 -6.72 6 -6.72 6 -7.59 0 -1.11 5 -2.15 0 0.000 0 0.000 0 0.000 0 0.000 0 0.000 0 0.000 0 0.000	E-10 E-10 E-10 E-10 E-10 E-10 E-10 E-10	0.00E+0	-2.90E+0 0.00E+0 -2.90E+0 -1.95E+1 0.00E+0 0.00E+0 0.00E+0 -4.15E-3 -2ERM = Use of -4.71E-9 -6.89E-3 -1.33E-3 0.00E+0	-3.91E-1 -0.00E+0 -3.91E-1 -4.09E+1 -0.00E+0 -4.09E+1 -3.89E-3 -3.89E-3 -3.89E-3 -3.89E-3 -3.89E-3 -1.42E-4 -3.05E-9 -1.93E-1 -1.42E-4 -0.00E+0 -0.00E+0 -0.00E+0 -0.00E+0 -0.00E+0 -0.00E+0 -0.00E+0 -1.00E+0
Paramet PERE PERM PERT PENRE PENRE PENRE PENRE PENRE PENRE PENRE RSF NRSF FW Caption RESUIT 1 m² fl Paramet HWD NHWD RWD CRU MFR MER	ter L [I] [I] [I] [I] [I] [I] [I] [I	Jnit	A1-A3 2.79E+1 0.00E+0 2.79E+1 1.66E+2 3.62E+1 2.02E+2 9.21E-2 0.00E+0 0.00E+0 1.00E+0	A4 6.21E-2 0.00E+0 6.21E-2 1.24E+0 0.00E+0 1.24E+0 0.00E+0 0.00E+0 1.15E-4 enewable nergy res rimary en nergy res al; RSF = 4 - OU A4 6.50E-8 9.46E-5 1.69E-6 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0	A5 2.48E+0 0.00E+0 2.48E+0 1.81E+1 0.00E+0 1.81E+1 8.11E-3 0.00E+0 5.21E-3 primary 6 ources us ergy exclusiources us Use of re TPUT F A5 2.60E-6 6.88E-2 4.32E-4 0.00E+0 0.00E+0 6.16E-1	B1 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ 0.00E+ Energy e Ed as r uding no sed as r newable LOW B1 0.00E+	E E C C C C C C C C	7E-1	0.00E+0 0.00E+	C3/2 1.78E-1 0.00E+0 1.78E-1 3.62E+1 1.51E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 6.66E-9 4.23E-1 6.31E-5 0.00E+0 0.00E+0 0.00E+0 0.00E+0	C3/3 7.92E-2 0.00E+0 7.92E-2 3.65E+1 -3.62E+1 0.00E+0 0.00E+0 0.00E+0 1.13E-4 ergy resc of renew sources se of non of non-re C3/3 9.42E-11 1.53E-4 3.62E-5 0.00E+0 0.00E+0 0.00E+0 0.00E+0	C4/1 1.68E- 0.00E+ 1.68E- 2.30E+ 0.00E+ 0.00E+ 5.50E- surces us able print used as anewable C4/1 8.88E- 2.14E+ 3.48E- 0.00E+ 0.00E+ 0.00E+	D 1 -4.71 0 0.000 1 -4.71 0 0.000 1 -4.71 0 0.000 0 -3.13 0 0.000 0 0.000 0 0.000 6 -6.72 6 -6.72 6 -6.72 6 -6.72 6 -7.59 0 -1.11 5 -2.15 0 0.000 0 0.000 0 0.000 0 0.000 0 0.000 0 0.000 0 0.000 0 0.000 0 0.000 0 0.000	E-10 E-10 E-10 E-10 E-10 E-10 E-10 E-10	0.00E+0	-2.90E+0 0.00E+0 -2.90E+0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 4.15E-3 PERM = Use of sources; S = Use of -1.95E-3 -1.33E-3 0.00E+0	-3.91E-1 -0.00E+0 -3.91E-1 -4.09E+1 -0.00E+0 -4.09E+1 -8.26E-1 -0.00E+0 -3.89E-3 -3.89E-3 -3.89E-3 -3.89E-3 -1.42E-4 -1.42E-4 -0.00E+0 -0.00E+0 -0.00E+0 -0.00E+0 -0.00E+0 -0.00E+0 -0.00E+0 -0.00E+0 -1.00E+0



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