

Online Resource 2: EPD Validation Dataset

Supplementary material for “Credible AI-Generated Carbon Footprints for Products”

Overview

This document lists all 269 Environmental Product Declarations (EPDs) used for validation of the Advanced Modeling System (Case 2) in the main paper. EPDs were sourced primarily from EPD International and represent a diverse range of product categories.

Summary by Category

Table OR2.1: Distribution of EPDs by product category

Category	Count
Food & beverages	73
Chemical products	63
Metal, mineral, plastic & glass products	56
Textiles, footwear & apparel	16
Construction products	13
Paper and plastic products	13
Vehicles & transport equipment	13
Machinery & equipment	12
Furniture & other goods	10
Total	269

Full EPD List

Table OR2.2: Complete list of EPDs used for validation

#	Product Name	Category	Unit
1	AFFINITY™	Chemical products	1 kg
2	ALOX	Chemical products	1 kg
3	AQUOXIL	Chemical products	1 kg
4	Acetone (cumene/Hock process; co-product of phenol)	Chemical products	1 kg
5	Additive Compounds	Chemical products	1 kg
6	Anhydrous Citric Acid	Chemical products	1 kg

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#	Product Name	Category	Unit
7	Anhydrous Citric Acid Monohydrate	Chemical products	1 kg
8	BEWAT	Chemical products	1 kg
9	BITUBOND N	Chemical products	1 kg
10	Calcium Citrate	Chemical products	1 kg
11	Chlorine ISCC+ certified	Chemical products	1 kg
12	Colloidal Silica 1430NA	Chemical products	1 kg
13	Crosslinkable Compounds	Chemical products	1 kg
14	DeorNet Clor	Chemical products	1 kg
15	Diacetyl Epoxy Plant Glyceride Oleate (HM-828)	Chemical products	1 kg
16	EarthCare Glycol E	Chemical products	1 kg
17	Epoxidized Soybean Oil (HM01-R)	Chemical products	1 kg
18	Famiglia convivenze pronto uso	Chemical products	1 kg
19	HFFR Compounds	Chemical products	1 kg
20	Hydrogen peroxide, ~49–50 wt% aqueous solution	Chemical products	1 kg
21	Hydroxypropyl Starch Ether (HPS)	Chemical products	1 kg
22	Isopropyl alcohol (IPA, 2-propanol)	Chemical products	1 kg
23	LIGNOVA™ Crude	Chemical products	1 kg
24	Neralit® 581	Chemical products	1 kg
25	PA6 G35 OPE NAT NEVIECO	Chemical products	1 kg
26	PA6 black masterbatch	Chemical products	1 kg
27	PA6/610 (50/50 copolymer) unfilled resin	Chemical products	1 kg
28	PTC100 Polypropylene for bituminous membranes	Chemical products	1 kg
29	PTC1200	Chemical products	1 kg
30	PTC1500	Chemical products	1 kg
31	PTC300 Polypropylene for bituminous membranes	Chemical products	1 kg
32	PTC700	Chemical products	1 kg
33	PTC800	Chemical products	1 kg
34	PTC900	Chemical products	1 kg
35	Plant Oil Polyols	Chemical products	1 kg
36	Pure HD	Chemical products	1 kg
37	Rituximab	Chemical products	1 kg
38	SUMFLEX NG(X)(PRX)8000/8080	Chemical products	1 kg

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#	Product Name	Category	Unit
39	SUMFLEX NG7000(7015)/PRX1000	Chemical products	1 kg
40	SUMFLEX NGX9000	Chemical products	1 kg
41	Silicone oil containing hydrogen	Chemical products	1 kg
42	Sodium chlorate (NaClO ₃)	Chemical products	1 kg
43	Sodium chloride (vacuum-evaporated, industrial grade)	Chemical products	1 kg
44	Sodium hypochlorite (NaOCl)	Chemical products	1 kg
45	Sodium lauryl sulfate (SLS), powder, 95% active	Chemical products	1 kg
46	Sulphuric acid technical grade, 94–96.5%	Chemical products	1 kg
47	TDI	Chemical products	1 kg
48	TDI bio-circular attributed feedstock	Chemical products	1 kg
49	TPU	Chemical products	1 kg
50	Tartaric Acid	Chemical products	1 kg
51	Titanium dioxide (TiO ₂), pigment-grade	Chemical products	1 kg
52	ULTRACARE GROUT CLEANER	Chemical products	1 kg
53	ULTRACARE HD CLEANER	Chemical products	1 kg
54	ULTRACARE KERANET	Chemical products	1 kg
55	ULTRACARE KERAPOXY CLEANER	Chemical products	1 kg
56	ULTRACARE MULTICLEANER	Chemical products	1 kg
57	ULTRACARE SMOOTH SILICONE	Chemical products	1 kg
58	Ultra Blue	Chemical products	1 kg
59	XLPE compound siloxane 1 step (KTT120PA)	Chemical products	1 kg
60	XNO3 niobium-based anode active material	Chemical products	1 kg
61	epsilon-caprolactam	Chemical products	1 kg
62	hydroxyethyl methyl cellulose (HEMC)	Chemical products	1 kg
63	poly(1,4-cyclohexanedimethylene terephthalate-co-isophthalate)	Chemical products	1 kg
64	BITUTHENE 4000 Waterproofing Membrane	Construction	1 kg
65	Calsimo X Plaster Range	Construction	1 kg
66	Cement Mortars (MEGACRET-50 THIXO)	Construction	1 kg
67	Epoxy Coatings DUROFLOOR	Construction	1 kg

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#	Product Name	Category	Unit
68	Glass Mineral Wool Insulation	Construction	1 kg
69	Grouts (MULTIFILL-DIAMOND 1-12)	Construction	1 kg
70	Interior Paints (JUNO Junoprof)	Construction	1 kg
71	Intumescent Paints for Fire Protection	Construction	1 kg
72	One-component Polyurethane Liquid Waterproofing Membranes	Construction	1 kg
73	SLA Barrier Pipe System	Construction	1 kg
74	Sigma Profile 4MM	Construction	1 kg
75	Surface preparation products (DURO-STICK D-64)	Construction	1 kg
76	Water Dispersion Facade Primer	Construction	1 kg
77	Kellogg's Frosted Flakes (300g box, U.S.)	Food & beverages	1 kg
78	Amy's Cheese Enchilada (frozen meal)	Food & beverages	1 kg
79	Barley - Australia	Food & beverages	1 kg
80	Beef tomato	Food & beverages	1 kg
81	Broiler Chicken - Philippines	Food & beverages	1 kg
82	Buondi Albicocca	Food & beverages	1 kg
83	Buondi Cacao	Food & beverages	1 kg
84	CIRIO Borlotti Beans Glass Jar 370g	Food & beverages	1 kg
85	CIRIO Passata Sieved Tomatoes	Food & beverages	1 kg
86	CIRIO Pelati	Food & beverages	1 kg
87	Campbell's Chunky Classic Chicken Noodle Soup	Food & beverages	1 kg
88	Cheddar cheese	Food & beverages	1 kg
89	Chicken breast fillet	Food & beverages	1 kg
90	Chickpeas Can 400g	Food & beverages	1 kg
91	Chopped tomatoes "Cuor di Pelato"	Food & beverages	1 kg
92	Chopped tomatoes "Cuor di pomodoro"	Food & beverages	1 kg
93	Chopped tomatoes "La Polpadoro"	Food & beverages	1 kg
94	Chopped tomatoes "Rossopizza denso"	Food & beverages	1 kg
95	Cirio Passata Rustica Crushed Tomatoes	Food & beverages	1 kg
96	Cirio Peeled Plum Tomatoes	Food & beverages	1 kg
97	Cluster tomato	Food & beverages	1 kg
98	Cornetto integrale Misura Fibrextra	Food & beverages	1 kg
99	Croissant Classico	Food & beverages	1 kg
100	Crude Palm Oil (CPO)	Food & beverages	1 kg

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#	Product Name	Category	Unit
101	Cucumber	Food & beverages	1 kg
102	Derby Blue Bevanda Arancia Rossa Zero	Food & beverages	1 kg
103	DiGiorno Original Rising Crust Pepperoni Pizza	Food & beverages	1 kg
104	D-glucose (dextrose) monohydrate	Food & beverages	1 kg
105	FALANI Canned Peaches in Light Syrup	Food & beverages	1 kg
106	Finely chopped tomatoes with basil	Food & beverages	1 kg
107	Frollino Integrale Misura Fibrextra	Food & beverages	1 kg
108	Fruit Drink Blood Orange, Carrot and Lemon	Food & beverages	1 kg
109	Fruit Drink Orange, Apple, Carrot and Lemon Juice	Food & beverages	1 kg
110	Fruit Drink Orange, Apple, Carrot and Lemon Juice	Food & beverages	1 kg
111	Fruit drink Red Fruits	Food & beverages	1 kg
112	Green peas	Food & beverages	1 kg
113	Il Panettone tradizionale Mini 90 g	Food & beverages	1 kg
114	Kellogg's Frosted Flakes (U.S.)	Food & beverages	1 kg
115	Maruchan Ramen Noodle Soup, Chicken Flavor	Food & beverages	1 kg
116	Nature Valley Crunchy Oats 'n Honey gra- nola bars	Food & beverages	1 kg
117	Palm - Indonesia	Food & beverages	1 kg
118	Palm fruit bunch - Indonesia	Food & beverages	1 kg
119	Pandoro di Verona Bauli 1000 g	Food & beverages	1 kg
120	Pasta di semola Agnesi	Food & beverages	1 kg
121	Peeled plum tomatoes "Gran Pelati del Salento"	Food & beverages	1 kg
122	Pepperidge Farm Goldfish Cheddar crack- ers	Food & beverages	1 kg
123	Petto di pollo convenzionale OGM free	Food & beverages	1 kg
124	Pomodori Secchi Sottolio Alla Siciliana	Food & beverages	1 kg
125	Progresso Vegetable Classics Minestrone	Food & beverages	1 kg
126	Quaker Instant Oatmeal – Apples & Cin- namon	Food & beverages	1 kg
127	Rapeseed - Canada	Food & beverages	1 kg

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#	Product Name	Category	Unit
128	SILVAFEED Q	Food & beverages	1 kg
129	Sieved tomatoes “La Rustica”	Food & beverages	1 kg
130	Sieved tomatoes “Rustica”	Food & beverages	1 kg
131	Sieved tomatoes steamed cooked	Food & beverages	1 kg
132	Soft Drink Blood Orange	Food & beverages	1 kg
133	Soft Drink Multifruit	Food & beverages	1 kg
134	Soft Drink Multifruit Brik 330 ml	Food & beverages	1 kg
135	Soft Drink Pineapple Brik 1500 ml	Food & beverages	1 kg
136	Soybean Protein Concentrate	Food & beverages	1 kg
137	Wheat - France	Food & beverages	1 kg
138	White Kidney Beans “Cannellini” Cluster 3x400g	Food & beverages	1 kg
139	Whole chicken with giblets	Food & beverages	1 kg
140	Yogurt Yomo Food Service	Food & beverages	1 kg
141	ZEUS Grapes	Food & beverages	1 kg
142	Zucchero Classico da barbabietola sfuso	Food & beverages	1 kg
143	beef meat	Food & beverages	1 kg
144	chilled and vacuum-packed boneless beef cuts	Food & beverages	1 kg
145	farina integrale	Food & beverages	1 kg
146	frozen and vacuum packed bone beef	Food & beverages	1 kg
147	maize grain	Food & beverages	1 kg
148	petto di pollo biologico	Food & beverages	1 kg
149	wheat grain production	Food & beverages	1 kg
150	AYA High Table	Furniture & goods	1 kg
151	Bose SoundLink Revolve Bluetooth speaker	Furniture & goods	1 kg
152	Bose over-the-ear headphones	Furniture & goods	1 kg
153	Flexible Polyurethane Foam (Furniture)	Furniture & goods	1 kg
154	GMK81 75% Wireless Mechanical Key- board	Furniture & goods	1 kg
155	Grafton Conference Chair	Furniture & goods	1 kg
156	Medium Density Fiberboard (MDF)	Furniture & goods	1 kg
157	OVO Armchair (Timber Seat)	Furniture & goods	1 kg
158	Swurve Office Chair	Furniture & goods	1 kg
159	Wood Particleboard	Furniture & goods	1 kg

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#	Product Name	Category	Unit
160	Kitchen Mixers	Metals/minerals	1 kg
161	Adjustable micropipette (P20/P200/P1000)	Machinery & equip.	1 kg
162	Anker Nano Power Bank (22.5W, USB-C, A1653)	Machinery & equip.	1 kg
163	Li-ion battery cell, NMC811 cathode, graphite anode	Machinery & equip.	1 kg
164	Logitech B100 Optical Computer Mouse (wired)	Machinery & equip.	1 kg
165	Logitech B100 Optical Computer Mouse (wired)	Machinery & equip.	1 kg
166	Microcentrifuge	Machinery & equip.	1 kg
167	Multichannel pipette (12-channel)	Machinery & equip.	1 kg
168	Roller chain – alloy steel plates/pins	Machinery & equip.	1 kg
169	Solar module - US/Vietnam	Machinery & equip.	1 kg
170	Tesla Powerwall battery	Machinery & equip.	1 kg
171	Vortex mixer	Machinery & equip.	1 kg
172	residential solar module	Machinery & equip.	1 kg
173	12oz Aluminum can - industry standard	Metals/minerals	1 kg
174	3xxx Series Aluminium Foil	Metals/minerals	1 kg
175	8xxx Series Aluminium Foil	Metals/minerals	1 kg
176	Wind-turbine hub – ductile iron, sand-cast (50kg)	Metals/minerals	1 kg
177	Alumina Zirconia AZ40	Metals/minerals	1 kg
178	Aluminium Foil	Metals/minerals	1 kg
179	Aluminium Hard Plates 7xxx	Metals/minerals	1 kg
180	Aluminium billet 606x alloy family	Metals/minerals	1 kg
181	Aluminium billets in 1050 - 3103 alloy	Metals/minerals	1 kg
182	Aluminium billets in 6082 M alloy	Metals/minerals	1 kg
183	Aluminium homogenised plates and billets 5000 green	Metals/minerals	1 kg
184	Aluminium ingot - Semi-Primary	Metals/minerals	1 kg
185	Aluminium ingots from recycling in continuous casting	Metals/minerals	1 kg
186	Aluminium ingots from recycling (continuous casting)	Metals/minerals	1 kg

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#	Product Name	Category	Unit
187	Aluminium ingots, code 023309 (EN AB43200)	Metals/minerals	1 kg
188	Aluminium ingots, code 023517 (Alloy CP13)	Metals/minerals	1 kg
189	Aluminium ingots, code 023518 (Alloy PS18)	Metals/minerals	1 kg
190	Aluminium ingots, code 093211 (Alloy HD1.1 Honda)	Metals/minerals	1 kg
191	Aluminium plates and billets 6060 green 100 plus	Metals/minerals	1 kg
192	Aluminium plates and billets 6060 green A 80	Metals/minerals	1 kg
193	Aluminium plates and billets 6060 green B 80	Metals/minerals	1 kg
194	Aluminium plates and billets 6082 green 100 plus	Metals/minerals	1 kg
195	Aluminium plates and billets 6082 green A 80	Metals/minerals	1 kg
196	Aluminium plates and billets 6082 green B 80	Metals/minerals	1 kg
197	CALCE VIVA CALCICA	Metals/minerals	1 kg
198	CHIC DOOR HINGE OVERLAP 160	Metals/minerals	1 kg
199	Cathode Aluminium Foil	Metals/minerals	1 kg
200	Coated Steel Cabinet	Metals/minerals	1 kg
201	Cruciform ER1682RX	Metals/minerals	1 kg
202	Cruciform [®] ER5312RX	Metals/minerals	1 kg
203	Deoxidation briquette from FENEGA	Metals/minerals	1 kg
204	ECOAL Aluminium billet	Metals/minerals	1 kg
205	ER 1681 [®] DALLE TJ	Metals/minerals	1 kg
206	Ecolen Polypropylene homopolymer resins	Metals/minerals	1 kg
207	Extruded Aluminum (Industry Average)	Metals/minerals	1 kg
208	Forged Steel Products	Metals/minerals	1 kg
209	Ground calcium carbonate (GCC), dry, ultrafine	Metals/minerals	1 kg
210	Hip implant stem – Ti-6Al-4V, forged + machined	Metals/minerals	1 kg

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#	Product Name	Category	Unit
211	Kitchen sink – 304 stainless steel, deep-drawn	Metals/minerals	1 kg
212	Masplene [®] MAS 8770	Metals/minerals	1 kg
213	Monocrystalline alumina MA88	Metals/minerals	1 kg
214	Multilayer ceramic capacitor (MLCC), X7R	Metals/minerals	1 kg
215	PET resin	Metals/minerals	1 kg
216	PETG pellets	Metals/minerals	1 kg
217	PET resin, bottle-grade (virgin)	Metals/minerals	1 kg
218	Prints Collection	Metals/minerals	1 kg
219	RESTORA ULTRA - ULTRA LOW CARBON ALUMINIUM	Metals/minerals	1 kg
220	RX 700 HP+	Metals/minerals	1 kg
221	Santoprene [™] TPV (PP/EPDM grade)	Metals/minerals	1 kg
222	Steel Cabinet (not coated)	Metals/minerals	1 kg
223	Thermoplastic elastomer (TPE-O/TPO) pellets	Metals/minerals	1 kg
224	Wind-turbine hub – ductile iron, sand-cast	Metals/minerals	1 kg
225	Zurcon [®] Z20V	Metals/minerals	1 kg
226	flat glass, uncoated	Metals/minerals	1 kg
227	steel, chromium steel 18/8	Metals/minerals	1 kg
228	Agaveplast	Paper & plastic	1 kg
229	Coloured PE Flexible Films, Printed	Paper & plastic	1 kg
230	Coloured PE Flexible Films, Unprinted	Paper & plastic	1 kg
231	Flint glass bottles 720-779 ml	Paper & plastic	1 kg
232	Flint glass jars 205-222 ml	Paper & plastic	1 kg
233	Flint glass jars 390-446 ml	Paper & plastic	1 kg
234	Natural PE Flexible Films, Printed	Paper & plastic	1 kg
235	Natural PE Flexible Films, Unprinted	Paper & plastic	1 kg
236	Oysterplast	Paper & plastic	1 kg
237	PE pellets made from recycled post-consumer waste	Paper & plastic	1 kg
238	SUMPOL IPP MF 6-10 (=S1040)	Paper & plastic	1 kg
239	UVAG glass bottles 767-782 ml	Paper & plastic	1 kg
240	corrugated board box	Paper & plastic	1 kg
241	Faux-down synthetic puffer jacket	Textiles/apparel	1 kg

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#	Product Name	Category	Unit
242	Cashmere	Textiles/apparel	1 kg
243	Chinos, 100% cotton twill	Textiles/apparel	1 kg
244	Crewneck wool sweater (100% wool)	Textiles/apparel	1 kg
245	Denim jeans (cradle-to-gate, packaged)	Textiles/apparel	1 kg
246	ECONYL NTF Texturized Yarns on Cones	Textiles/apparel	1 kg
247	ERLY (Eco Recycled Leather Yarn)	Textiles/apparel	1 kg
248	MWool yarn	Textiles/apparel	1 kg
249	MWool yarn	Textiles/apparel	1 kg
250	Nike air max	Textiles/apparel	1 kg
251	PA6 dope-dyed yarn	Textiles/apparel	1 kg
252	Poly Air™ (Polyester Staple Fiber)	Textiles/apparel	1 kg
253	TAC Reborn Yarn (from 100% Re-PET)	Textiles/apparel	1 kg
254	fibre, polyester	Textiles/apparel	1 kg
255	lululemon-style yoga pants (81% nylon / 19% Lycra)	Textiles/apparel	1 kg
256	yarn, cotton	Textiles/apparel	1 kg
257	Aluminum bicycle frame (TIG-welded, heat-treated)	Vehicles/transport	1 kg
258	Automotive three-way catalytic converter	Vehicles/transport	1 kg
259	Axkid One 3 Car Seat	Vehicles/transport	1 kg
260	Brake caliper	Vehicles/transport	1 kg
261	CALIPER 4x52 - FRT; RH	Vehicles/transport	1 kg
262	Hollow Structural Sections (HSS) Steel	Vehicles/transport	1 kg
263	Laminated Coated Windshield 2.1/1.6 mm	Vehicles/transport	1 kg
264	Laminated HUD Coated Windshield	Vehicles/transport	1 kg
265	Laminated SolarWall Canopy	Vehicles/transport	1 kg
266	Laminated Windshield 2.1/1.6 mm	Vehicles/transport	1 kg
267	Stainless Steel Cable Support Products	Vehicles/transport	1 kg
268	Trek Fuel EX 5 Deore	Vehicles/transport	1 kg
269	Trek Madone SLR 9 Disc	Vehicles/transport	1 kg

⁹ Note: Generated from evaluation data. See `generate_online_resource_2.py` for reproduction.