

PHOTOVOLTAIK & BIM / IFC

ENVIRONMENTAL DATA IN CONSTRUCTION IN AUSTRIA

Hildegund Figl

IBO – Austrian Institute for Building and Ecology

INDICATOR WIDELY USED IN AUSTRIA FOR THE LCA OF BUILDINGS

Oekoindex OI3

Weighted indicator based on normalised*):

- GWP-total Global Warming Potential
- PENRT Primary Energy, non ren, total
- AP Acidification Potential

Standard: EN 15804+A1

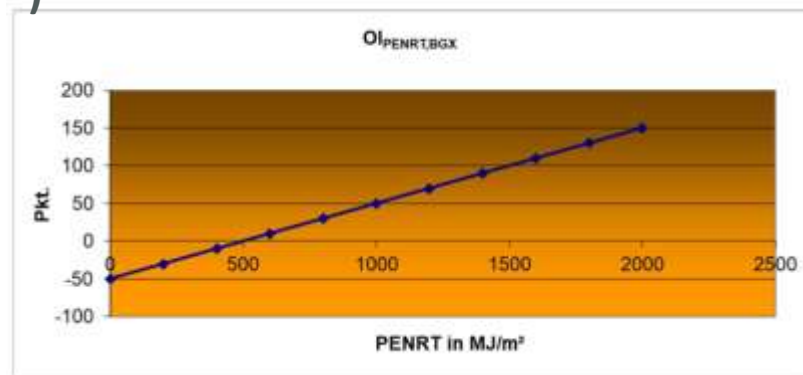
(transfer to A2 in preparation)



Various fields of application:

- Subsidies for residential buildings
 - Vorarlberg, Tyrol, Carinthia, ...
- Building assessment / declaration tools
 - klimaaktiv (BMK), TQB (total quality building),...
- Sustainable procurement
 - Municipal building permit (KGA)

*)



Infos and Manuals:

<https://www.ibo.at/en/building-material-ecology/lifecycle-assessments/oekoindex-oi3>

FRAMEWORK / SYSTEM BOUNDARY (“BILANZGRENZE = BG”)

BG0/BG1 (OI3_{BG0} or OI3_{BG1} still in use, but dying out):

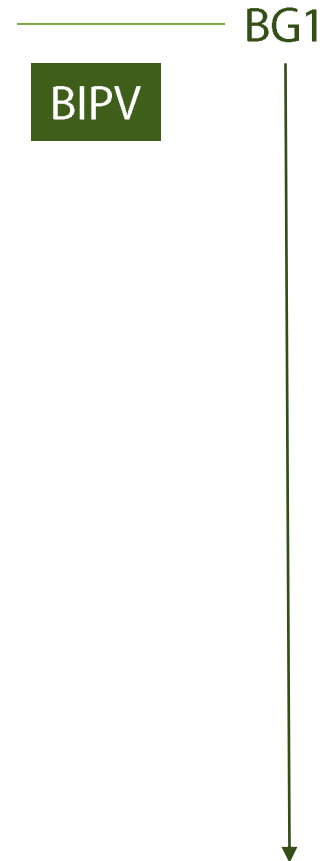
- Thermal building envelope as in calculation of energy performance / complete + ceilings
- Modules A1-A3

BG3 (OI3_{BG3} most common):

- Building excluding
 - technical building equipment,
 - negligible building parts outside the thermal building envelope, e.g. balcony, loggia, arcades etc.),
 - outdoor facilities, outbuildings, etc.
- Modules A1-A3, B4; consideration period: 50 years (specified for residential buildings)

BG6 (OI3_{BG6} or GWP for EU-Taxonomy, presumably upcoming GWP for CPR/OIB RL7)

- Property boundary (including all outdoor facilities, technical building equipment etc.
- Modules A1-A3, A4, B4, C1-C4; B6



HARMONISED LCA-RULES IN AUSTRIA

Specific data

- Environmental product declaration
- Strict methodological framework:
<https://www.bau-epd.at/en/austria>
- Validation according to these rules

Generic data

- IBO reference values 2020 for LCA
upcoming: IBO reference values 2025
- + ÖNORM 8110-7 Thermal insulation in buildings
- Conservative values (upper limit values)

Background data base

- ecoinvent



EPD PO and think tank in Austria




ÖNORM
8110-7



baubook



<https://www.baubook.at/zentrale>

Katalog: IBO-Richtwerte 2020 

-   Bauprodukte (1122)

-   Haustechnik (102)
 -   Elektroinstallation (3)
 -   Lüftungsanlagen (26)
 -  **Photovoltaik-Anlagen (15)**
 -   Sanitärinstallationen (5)
 -  Solarthermie-Anlagen (6)
 -  Speicher und Tanks (1)
 -   Verteilsysteme (21)
 -   Wärmeabgabesysteme (5)
 -   Wärmeerzeuger (20)

-   Prozesse (78)
 -  Bearbeitungsprozesse (6)
 -  Entsorgung (25)
 -   Gebäudebetrieb (41)
 -  Transportmittel (6)

Photovoltaik-Anlagen

Anleitung 

 Druckansicht

 Spalten

	Titel	PENRT MJ/m ²	GWP-T kg CO ₂ equ./m	AP kg SO ₂ equ./m ³
	Elektroinstallationen für 3 kWp Photovoltaikanlage			
	Photovoltaiklaminat, a-Si	691,89	36,42	0,18
	Photovoltaiklaminat, CdTe	1.034,67	63,75	0,47
	Photovoltaiklaminat, CIS	1.644,35	94,91	0,54
	Photovoltaikmodul ohne Rahmen, mono-Si	3.943,46	227,95	1,05
	Photovoltaikmodul ohne Rahmen, multi-Si	3.351,15	194,98	0,91
	Photovoltaikmodul ohne Rahmen, ribbon-Si	2.421,15	142,15	0,69
	Photovoltaikpaneel, a-Si	938,92	60,91	0,27
	Photovoltaikpaneel, CIS	1.747,71	105,62	0,57
	Photovoltaikpaneel, mono-Si	4.085,57	243,61	1,10
	Photovoltaikpaneel, multi-Si	3.493,27	210,64	0,96
	Photovoltaikpaneel, Ribbon-Si	2.563,26	157,80	0,74
	Wechselrichter 2500 W, Photovoltaik			

FROM BAUBOOK DATA BASE TO OTHER TOOLS

LCA data in bauook

Kennzahl	Einheit (pro kg)	Lebensphase Szenario								
		A1-A3	A4	A5	C1	C2	C3	C4	D aus A5	D aus C
					Deponierung	Deponierung	Deponierung	Deponierung		Deponierung
GWP-F	kg CO ₂ Äq.	0,201	0,0371	0,0325	0,00255	0,00826	0,00	0,00751	-0,000423	0,00
GWP-B	kg CO ₂ Äq.	-0,0468	0,00	0,00	0,00	0,00	0,00	0,0468	-4,56·10 ⁻⁶	0,00
GWP-T	kg CO ₂ Äq.	0,154	0,0371	0,0325	0,00255	0,00826	0,00	0,0543	-0,000428	0,00
ODP	kg CFC-11	2,38·10 ⁻⁸	6,81·10 ⁻⁹	3,19·10 ⁻⁹	4,64·10 ⁻¹⁰	1,51·10 ⁻⁹	0,00	2,30·10 ⁻⁹	-7,67·10 ⁻¹¹	0,00
AP	kg SO ₂ Äq.	0,000403	0,000121	0,000133	1,94·10 ⁻⁵	3,25·10 ⁻⁵	0,00	5,65·10 ⁻⁵	-8,94·10 ⁻⁷	0,00
EP	kg PO ₄ ³⁻	0,000221	2,92·10 ⁻⁵	7,73·10 ⁻⁵	4,51·10 ⁻⁶	7,47·10 ⁻⁶	0,00	1,27·10 ⁻⁵	-5,65·10 ⁻⁷	0,00
POCP	kg C ₂ H ₄	4,63·10 ⁻⁵	1,72·10 ⁻⁵	1,73·10 ⁻⁵	2,36·10 ⁻⁶	3,85·10 ⁻⁶	0,00	7,31·10 ⁻⁶	-1,02·10 ⁻⁷	0,00
PERE	MJ	0,243	0,00791	0,0404	0,000209	0,00151	0,00	0,00205	-0,00103	0,00
PERM	MJ	0,387	0,00	0,0194	0,00	0,00	0,00	0,00	0,00	0,00
PERT	MJ	0,630	0,00791	0,0598	0,000209	0,00151	0,00	0,00205	-0,00103	0,00
PENRE	MJ	3,12	0,571	0,440	0,0373	0,127	0,00	0,190		
PENRM	MJ	0,0478	0,00	0,00243	0,00	0,00	0,00	0,00		
PENRT	MJ	3,17	0,571	0,443	0,0373	0,127	0,00	0,190		

A1-A3 Herstellungsphase
 A4 Transport
 A5 Bau- / Einbauprozess
 C1 Rückbau, Abriss
 C2 Transport
 C3 Abfallbehandlung
 C4 Beseitigung
 D aus A5 Recyclingpotenzial A5
 D aus C Recyclingpotenzial C1-C4

✕ Fenster schließen



Basisdaten Energieausweis

12.000 users
 downloaded 1.300 times per month
 8 software partners

Baubook-tools, e.g.
 eco2soft LCA for buildings
<https://www.baubook.at/eco2soft/?lng=2/>



SUMMARY

- **EN 15804+A1**; EN 15804+A2 presumably starting with 2025
- **System boundaries:**
thermal building envelope (BG0) → building w.o. HVAC (**BG3**) → property borders (BG6)
BIPV part of system borders from BG1
- **OEKOINDEX OI3** (GWP, PENRT, AP) or GWP respectively
- Modules: A1-A3 → **A1-A3, B4** → A1-A3, A4, B4, C1-C4: B6
- Background data base: **ecoinvent**

- **EPD <-> BIM/IFC**
 - IFC properties – proposal for LCA indicators etc. existing (status ?)
 - Dimensions: **gross area** for outer shell, net area for inner walls
- EPD – DPP
 - **Strategies in development** (very early stage)

REFERENCES

Rules: <https://www.bau-epd.at/en/austria>

Data: <https://www.baubook.at/zentrale>

Tool: <https://www.baubook.at/eco2soft/?lng=2>

OEKOINDEX OI3: <https://www.ibo.at/en/building-material-ecology/lifecycle-assessments/oekoindex-oi3>