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This report contains 28 pages including 2 attachments

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1. Introduction and objectives

The biaxial load transferring reinforced concrete slab system developed by Unidome Deutschland GmbH is characterized by void formers made of plastic material, which replace a considerable proportion of the reinforced concrete with air in places that are of minor importance for the load transfer.

As a result, such less heavy reinforced concrete slabs can be made significantly slimmer with the same geometry and load. The saving of concrete is therefore not only given by the substitution as a result of the void formers, but also by the slimmer construction.

The saving of building materials correlates with the reduction of environmental impacts caused by the extraction of raw materials, the production of building materials and their transport and use in a building.

In this report, the environmental effects of a reinforced concrete slab with Unidome void formers are compared and quantified with a conventional, solid reinforced concrete slab. The results of this report can, for example, serve as the basis for life cycle assessments that are to be prepared for sustainability analyses of buildings and their certificates.

The investigations on which this report is based on are limited to the slab system. Other positive effects on other load transferring components of a building are not taken into consideration in these investigations. The database used is the generally acknowledged ÖKOBAUDAT released by German Federal Ministry of the Interior, Building and Home Affairs (www.oekobaudat.de).

2. Fundamentals

2.1. ÖKOBAUDAT

Ökobaudat represents a harmonized database. It forms the basis for life cycle assessments of buildings over their entire life cycle. In this report it is used for an exemplary comparison of a conventional solid slab system and the Unidome void former slab system. The database is used in the current version 2020-II from April 3rd, 2020.

2.2. Environmental impacts, indicators, and resources consumption

Evaluation criteria are defined to describe the various environmental impacts. The environmental impacts are quantified using the indicators described below:

- Global Warming Potential - GWP; Greenhouse gas emissions lead to anthropogenic climate change. Climate change poses a threat to the entire ecosystem on earth and therefore is a challenge for the humanity. The construction and operation of buildings is responsible for a large proportion of the greenhouse gases released, which opens the chance for a considerable reduction of anthropogenic greenhouse gases by appropriate planning. In addition to the release of greenhouse gases in the operating phase, the manufacturing and disposal of the building materials used also play a decisive role in the life cycle assessment. The assessment considers the CO_2

equivalent for construction, use and disposal of the building over a period of 50 years.

- **Ozone depletion potential- ODP**; Ozone, which occurs only in low concentration in atmosphere, shields a large part of the UV radiation. Chlorofluorocarbons are largely responsible for the fact that the ozone layer, which is so important for humans, flora, and fauna, has partially receded in the past. To counteract further destruction of the atmospheric ozone layer and to support its natural regeneration, the release of substances that damage the ozone layer into the earth's atmosphere must be reduced to a minimum. The assessment is based on the trichlorofluoromethane equivalent for the life cycle stages.
- **Photochemical Ozone creation potential – POCP**; Photochemical ozone is formed through reaction with tracer gases (e.g. nitrogen oxides and hydrocarbons). This photochemical ozone formation is also called ozone-smog and may attack the respiratory organs and can damage plants and animals. To assess the photochemical ozone creation potential (POCP) of a building during construction and operation, ethene equivalents are used for the life cycle stages.

- **Acidification potential– AP**; The term "acid rain" was defined in the 1980s due to the damages caused by precipitation. Deficiencies of nutrient supply of organisms, a disruption of the water balance, forest dieback and fish kill, but also damage to historical buildings and much more can be attributed to “acid rain”. For the assessment of the acidification potential (AP), sulfur dioxide equivalents are considered for the life cycle stages.
- **Eutrophication potential – EP**; Over-fertilization (eutrophication) refers to the increase of nutrients in soil and water. Nutrients are released into the environment during the manufacturing of construction products and as a result of the combustion of fossil fuels. Nitrogen and phosphor lead to increased algae growth with the resulting adverse effects on plants and animals. For the assessment of the eutrophication potential (EP), phosphate equivalents for the life cycle stages are used.

Furthermore, the use of resources such as raw materials, energy and space must be reduced by improving the efficiency of use. The demand for resources, especially for energy, is also considered during the life cycle of a building, divided into the renewable and non-renewable primary energy demand. In general, it is necessary to reduce the total demand for energy, which can be achieved by increasing energy efficiency. An increase in the proportion of renewable energy and the associated reduction in the proportion of non-renewable energy represents a further target and helps to minimize the consumption of resources, in this case fossil fuels.

2.3. Data for comparative calculation

For the compilation of the environmental impact of a building component, in this specific case the reinforced concrete slabs, numerous data are collected and evaluated. This report compares a Unidome void former slab with a conventional, solid reinforced concrete slab. Design and calculation criteria are kept the same and only those boundary conditions are varied that are expected to have a significant difference in effect. The first section describes the boundary conditions that apply fundamentally for both systems. In the second section, the differing data are explained.

2.3.1. Generally valid data for both systems

After consultation with Unidome, a concrete grade of C30/37 is assumed for the further approach. The data set[1] used for the calculation of environmental impacts is derived from the database Ökobaudat. These are in detail the data for the life cycle stages A1 "Raw material supply", A2 "Transport of raw materials to the concrete plant", A3 "Concrete production", A4 "Transport to construction site" and A5 "Placement of concrete on the construction site". Furthermore, the end of life stages are considered as follows: Life cycle stage C1 "De-construction and demolition", C2 "Transportation of concrete demolition for processing" and C3 "Crushing of concrete".

For steel reinforcement, the life cycle stages A1 to A4 and C1 to C2 are considered. Stages A1 to A3 and C1 to C2 are taken from the corresponding Ökobaudat data set[2]. Stage A4 is calculated using a truck transport data set[3] and an average transport distance. The transport distance is set to an average of 30 km after consultation with Unidome. For life cycle stage A5 "Installation of the reinforcement on site" there is no suitable approach, the resulting environmental impacts are considered negligible. Phase C3 "Waste treatment", which is comparable to concrete, is not relevant for reinforcing steel. The reinforcement ratio of the slabs is assumed to be 120 kg/m³ in agreement with Unidome. To support the upper reinforcement, DBV-BT cages with a weight per unit of 0.91 kg/m² for an 18 cm slab thickness and 2.75 kg/m² for a 40 cm slab thickness are considered. The appropriate values for intermediate slab thicknesses are interpolated in a straight line.

[1] (OEKOBAU.DAT: 1.4.01 Mineral building products / Mortar and Concrete / ready mixed concrete / C30-37, 2020-II)
[2] (OEKOBAU.DAT: 4.1.02 Metals / Steel and iron / Steel reinforcement mesh / Reinforcement steel, 2020/II)
[3] (OEKOBAU.DAT: 9.3.01 Others / Transport of goods [t km] / Truck, 2020/II)

2.3.2. Separate data for the Unidome slab system

The Unidome void former slab system substitutes a certain part of the concrete through at first the direct displacement of concrete by Unidome void formers, furthermore through the reduced slab thickness as a result of the lower load on the slab. The reduced amount of concrete leads to less environmental impact of a Unidome slab compared to a conventional, solid reinforced concrete slab. Ultimately, however, a comparison must also consider the environmental impacts that are added specifically as a result of the Unidome system. These, in turn, are directly related to the void formers and their life cycle stages, which are described in more detail below.

In production phase, only stages A2, A3 and A4 are applied for the compilation of data related to the void formers. Stage A1 "Raw material supply" is not considered, as the void formers consist of 100% recycled material. According to Unidome, stage A2 "Transport of the raw material for production" is considered with 200 km truck transportation[4] distance. Electrical energy consumed for production of concrete formers accumulates, according to Unidome, to approximately 0.10 kWh per piece. For the resulting environmental impacts, the data set[5] "Strommix DE 2015" of Ökobaudat is used. The environmental impacts of the data set used are generally speaking comparable with those resulting from the electricity mix at the manufacturing place of the concrete void formers. For the transport of the void formers to the construction site, 2000 km truck transportation[6] is assumed. The distance does not play a significant role in the chosen approach. If the void formers are used at significantly more distant locations, a separate assessment of stage A4 may be applied. The assembly of the void formers (stage A5) at the construction site is generally done manually, if necessary with a few crane movements of the site crane, and is therefore not considered further due to its negligible size.

Disposal is considered by stage C2 "Transport of the void former fractionary" and C3 "Waste treatment". Stage C1 is not relevant, as the void formers are dismantled together with the reinforced concrete slab. Separation of the void former fractionary from the surrounding concrete is possible by simple means and does not cause any significant environmental impact. Disposal (C4) is not an issue, as the concrete formers are either thermally utilized or recycled. For further assessment, the most realistic scenario possible is considered with rates of 70% recycling and 30% thermal recovery. The calculation of the environmental impacts from stages C2 and C3, is based on a data set[7] for polypropylene wastewater pipes as part of Ökobaudat.

The steel content of the Unidome slab is also determined based on a reinforcement ratio of 120 kg/m³. The lower loading of the Unidome slab as a result of the substitution of concrete by air, leads to the opportunity to reduce the steel reinforcement. For a Unidome slab with 18 cm thickness, the reinforcement content is reduced by 6%, and for a thickness of 40 cm, 16% less reinforcement may be applied. The reinforcement required to assemble

[4] (OEKOBAU.DAT: 9.3.01 Others / Transport of goods [t km] / Truck, 2020/II)
[5] (OEKOBAU.DAT: 9.2.05 Others / Energy carrier - delivery free user / Electricity / Electricity grid mix 2015, 2020/II)
[6] (OEKOBAU.DAT: 9.3.01 Others / Transport of goods [t km] / Truck, 2020/II)
[7] (OEKOBAU.DAT: 6.1.02 Plastics / Pipes / Sewer pipes / Sewer pipe PP, 2020/II)

the void formers is independent of the slab thickness and is assumed to be 1.0 kg/m². The required bond reinforcement is considered with a weight of 0.9 kg/m² for an 18 cm slab thickness and with 1.92 kg/m² for a 40 cm slab thickness. The respective corresponding values for intermediate slab thicknesses are interpolated in a straight line.

3. Results

3.1. Basics

The diagrams shown in the following sections compare the results for a conventional, solid reinforced concrete slab with the results for a Unidome void former slab. In a first approach the diagrams allow the comparison of a solid reinforced concrete slab of the same thickness with a Unidome slab in the area with void formers. The potential for slimmer Unidome slabs due to the load reduction is described in chapter 3.3. Chapter 3.5 explains the determination of the environmental impact of a Unidome slab taking into consideration the degree of coverage with void formers.

3.2. Graphical comparison

The following figures show the results of the individual impact categories. Qualitatively, the trends of all categories are very similar.

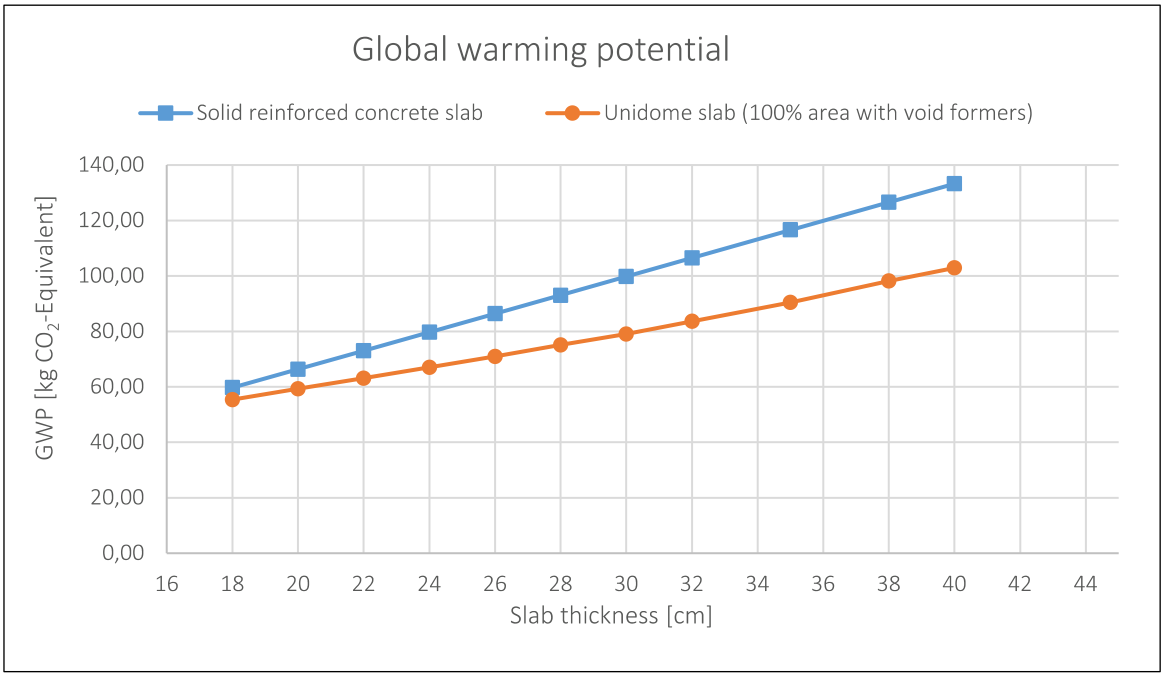

Figure 1: Savings of global warming potential

Greenhouse gas savings rise with increasing slab thickness from slightly more than 7% at a thickness of 18 cm to about 22% at a slab thickness of 40 cm.

The saving of released gases, which are responsible for the stratospheric ozone layer depletion is about 19% for a slab thickness of 18 cm, and about 32% less environmental impact is caused for a thickness of 40 cm.

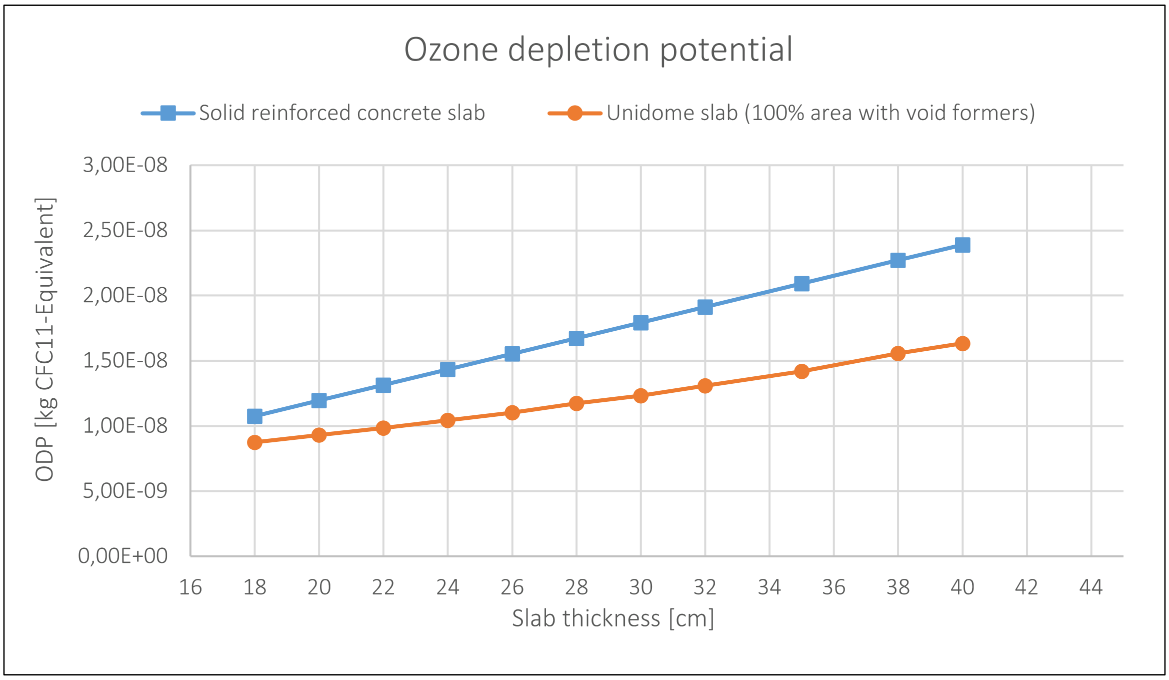

Figure 2: Savings of the released ozone depletion potential

The creation of photochemical ozone, better known as ozone-smog, is reduced between 11.5% for an 18 cm concrete slab thickness and almost 24% for a 40 cm concrete slab thickness.

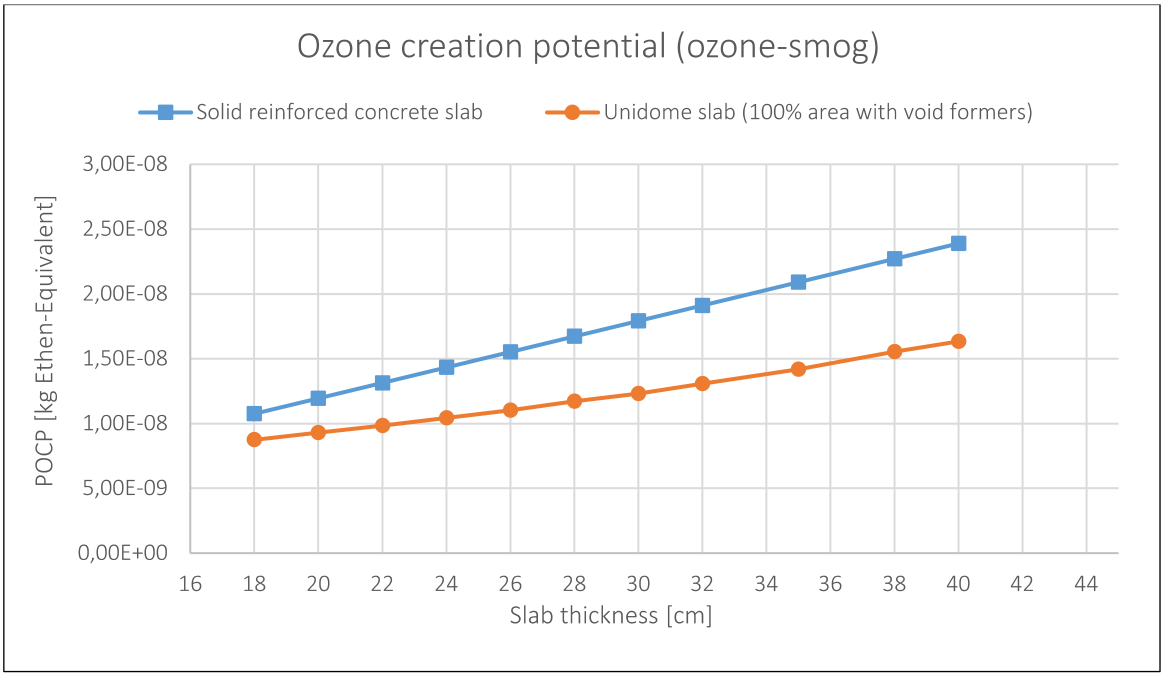

Figure 3: Savings of the photochemical ozone creation potential (ozone-smog)

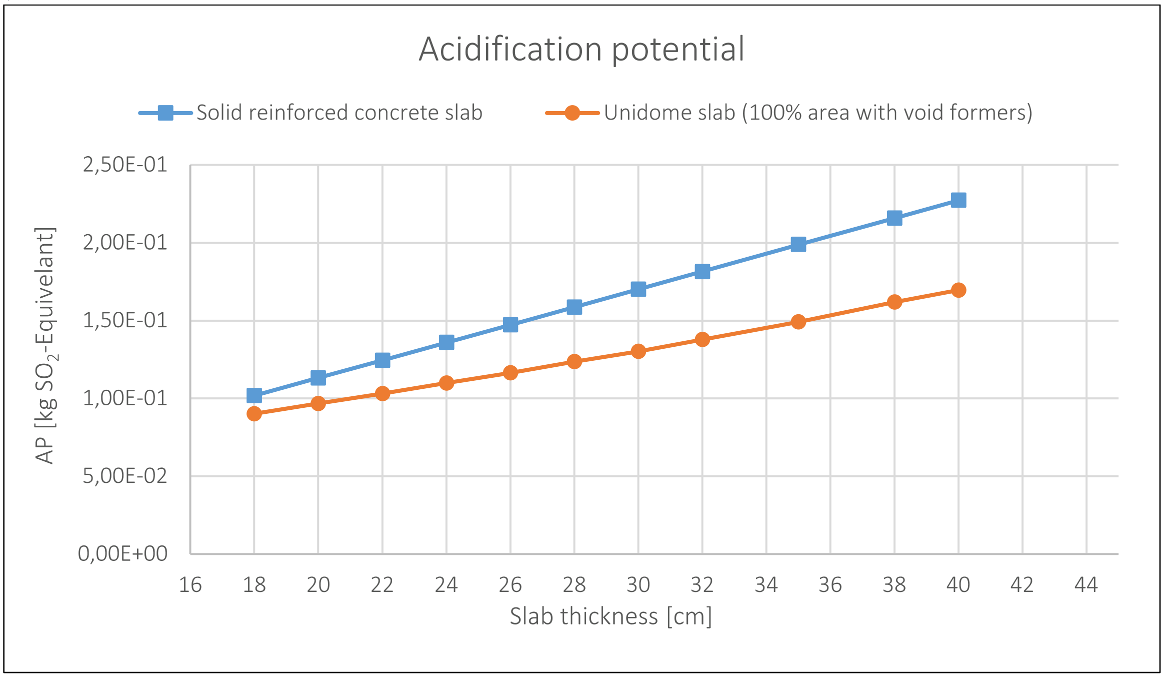

Figure 4: Savings of the acidification potential

Sulphur dioxide and other substances responsible for soil and water acidification can be reduced between roughly 11.5% and 25%.

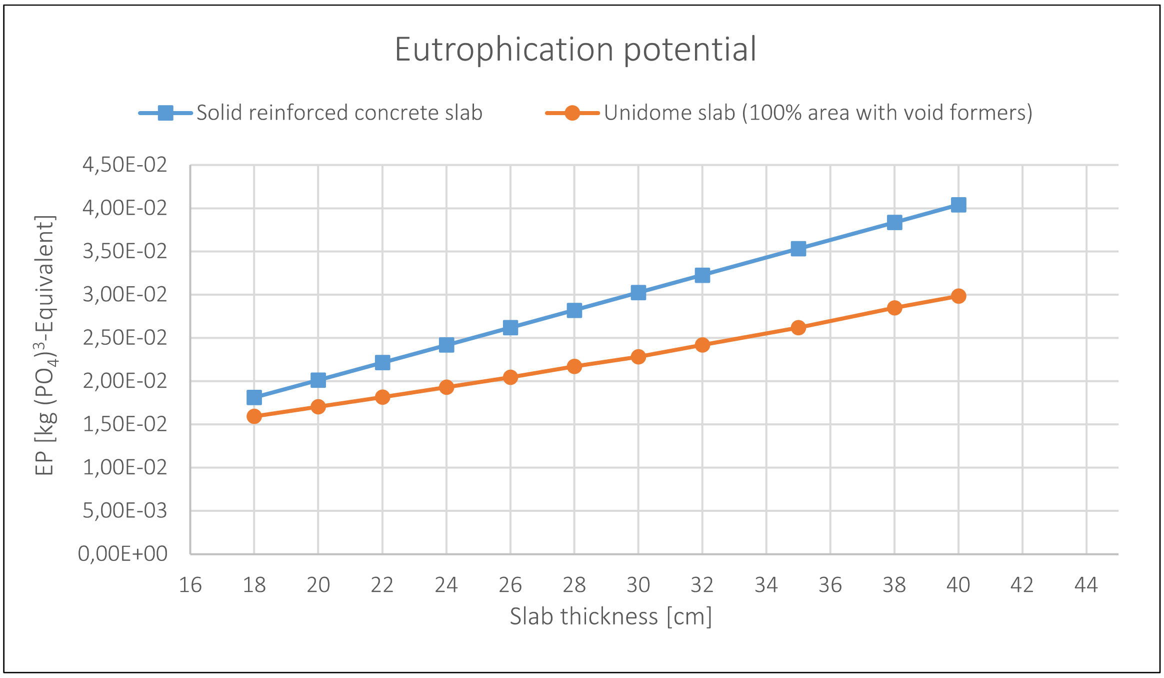

Figure 5: Savings of the Eutrophication potential

The input of nitrogen and phosphorus into soils and water can be countered with a reduction of 12% for an 18 cm slab thickness and 26% for a 40 cm slab thickness.

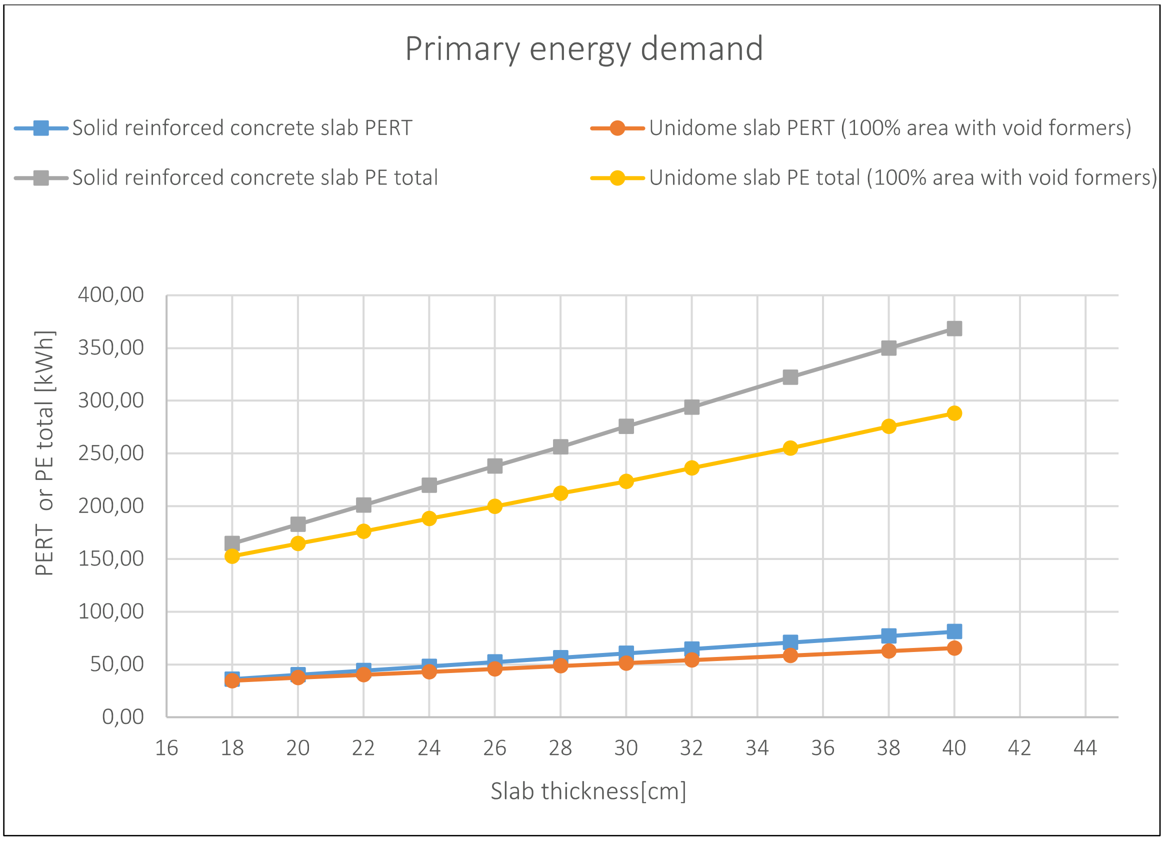

Figure 6: Savings of the Primary energy demand (PERT) und total (PE total)

Figure 6 shows the possibility of saving resources based on primary energy savings. Shown are the total primary energy demand (PE total), and the share of renewable primary energy (PERT). The savings range from about 4.5% to 19% for renewable primary energy and about 7% to 22% for total primary energy use.

By weighting the various environmental impacts, it is possible to calculate a ratio per slab thickness that provides an averaged statement of all savings. For this report, 40% of the weighting is applied to GWP and 10% for each other environmental impact ODP, POCP, AP and EP. In addition, the primary energy demands PERT and PE are weighted 10% each. The weighted result is shown in Figure 7. The percentage increase of savings as a function of the increasing slab thicknesses can be seen well.

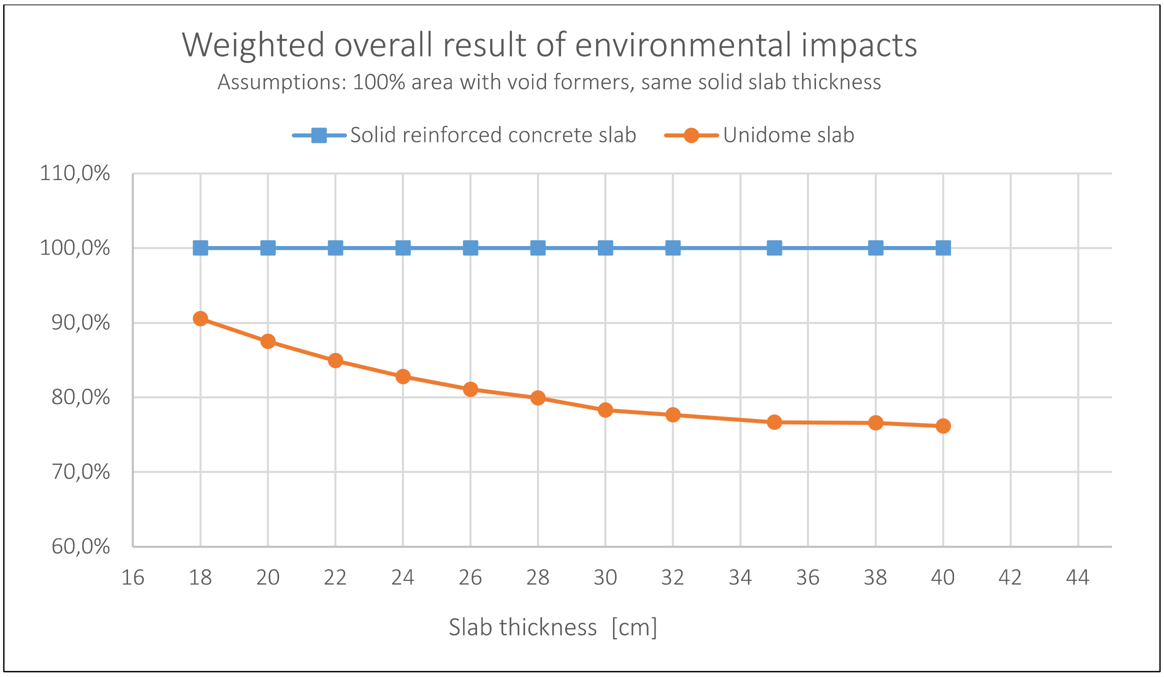

Figure 7: Weighted overall results

3.3. Consideration of a possible slab thickness reduction

The results shown in the previous chapter assume that the slab thickness of the void former slab is the same as the slab thickness of the solid concrete slab. Due to the reduction of the dead load as a result of the void formers, the slab thickness of the Unidome slab can be reduced compared to the ordinary reinforced concrete slab while maintaining the same properties in terms of deformation and load-bearing capacity. This reduction is then in turn reflected in a further saving of environmental impact.

Figure 8 shows schematically the possibility of further savings in greenhouse gases, representative for all other environmental impacts. It should be noted here that a Unidome slab with a thickness of 18 cm cannot be reduced further.

With a slab thickness of about 19 cm, the Unidome slab will be about 1 cm thinner, depending on the structural system and the loading. At a slab thickness of 30 cm, the possible slab thickness reduction is assumed to be about 2 cm. Starting from a slab thickness of 38 cm, a reduction of about 3 to 3.5 cm is assumed.

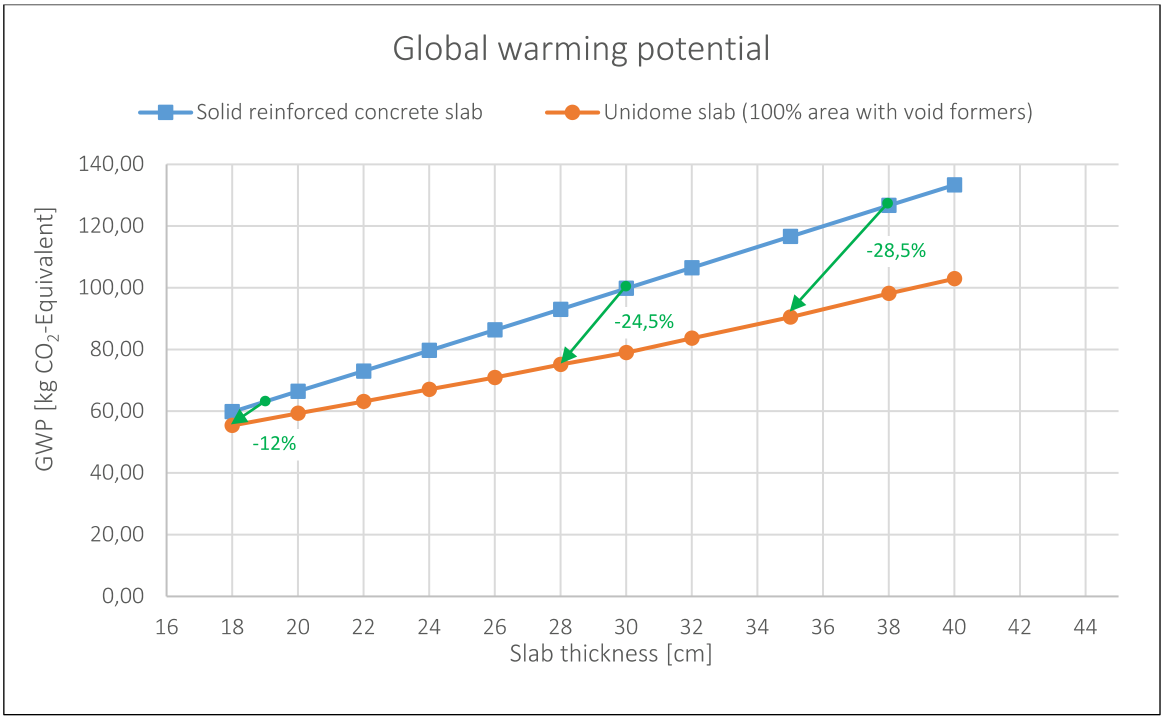

Figure 8: Further greenhouse gas (GWP) savings as a result of a reduction in slab thickness

In specific cases the assumptions presented in Figure 8 for possible reductions in the slab thickness of a Unidome slab compared to a solid concrete slab are to be determined by calculation. Chapter 3.3 particularly serves for illustration of the possible potential for further savings.

3.4. Overall weighted result for a Unidome slab with mean coverage of void formers and slab thickness reduction

As explained in Chapter 3.2, the results shown in Figures 1 to 7 apply to a coverage by void formers of 100%. Further savings due to a possible reduction of the slab thickness are not shown in these figures. Both boundary conditions influence the results. In the following, the "weighted overall result" known from Figure 7 is presented, considering usual boundary conditions for the coverage by void formers and the slab thickness reduction. The percentage of the area covered by void formers is usually between 60% and 70%, which leads to a mean value of 65%. The possible reduction of the slab thickness is considered staggered between 0.9 cm for an 18.9 cm solid slab thickness and 3.5 cm for a 43.5 cm solid slab thickness. Figure 9 compares the results of an Unidome slab with 65% void formers with the results for solid slabs with a variation of increased thickness between 0.9 cm and 3.5 cm. The influence of a concrete slab that is only partially covered with void formers can be almost completely compensated by the reduction of the slab thickness. In the comparison of the two figures 7 and 9, only very slight differences can be seen.

In conclusion, considering the weighting applied, an overall saving in environmental impact of between 10% for an 18 cm Unidome slab thickness and approximately 22% for a 40 cm thickness one can be detected.

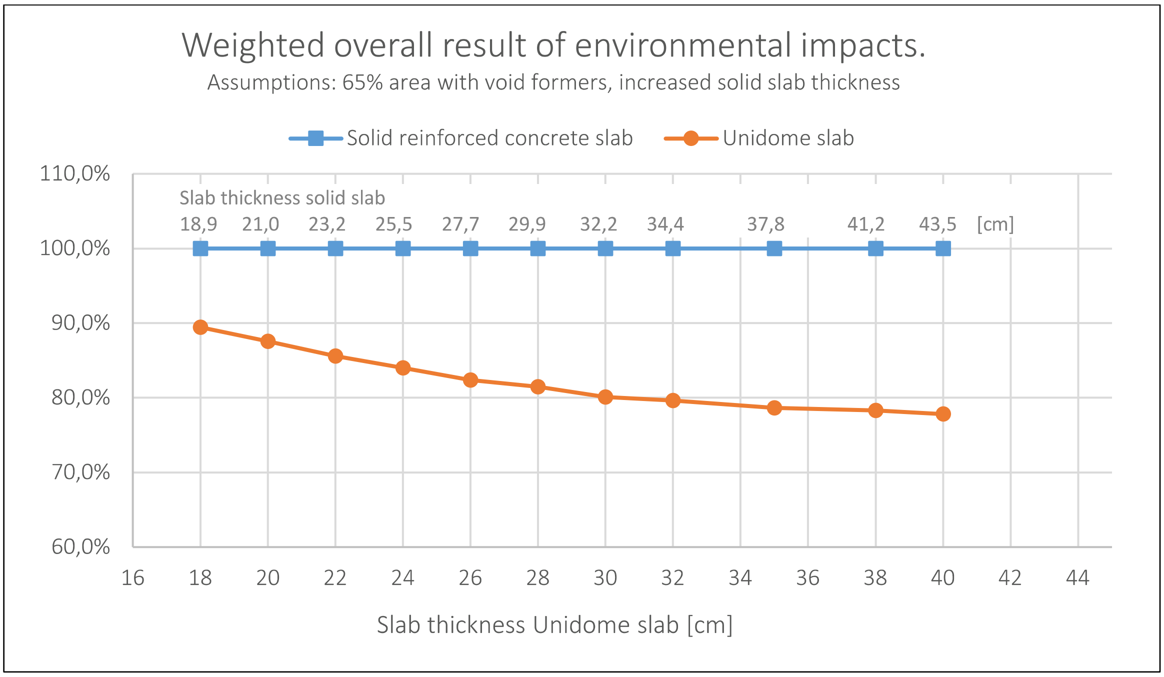

Figure 9: Weighted overall result for a mean coverage by void formers and a slab thickness reduction

3.5. Determination of the environmental impact of a Unidome slab

Considering the boundary conditions described in chapters 2.3 and 3.1, the environmental impacts of a solid reinforced concrete slab and the possible savings by applying a Unidome slab can be presented tabularly in the form of data sheets.

The data sheets for Unidome void formers of sizes XS60 to XS260, included in the appendix to this report, show in the upper part the results for solid reinforced concrete slabs with thicknesses between 18 cm and 40 cm. In the lower part of the tables, the savings resulting from the use of void formers are shown. The resulting environmental impact of a Unidome slab is obtained by adding the values for the solid slab (upper part of the data sheets) with the deduction values for the void formers (lower part of the data sheets). The area covered by Unidome void formers must be considered by multiplying the deduction values for the void formers by the degree of coverage. The degree of coverage results from the structural calculation, in particular from the necessary consideration of the shear force bearing capacity of the Unidome slab and averages out at 65 (±5) %. In the case that the structural calculation allows a slimmer slab thickness and this potential is used for further savings, the corresponding values can be taken from different data sheets. The data sheets allow a differentiated consideration of different life cycle stages. Thus, it is often desired to differentiate between a consideration of the stages A1-A3, C3 on the one hand or all relevant stages A1-A5, C1-C3 on the other hand.

4. Final remarks and conclusion

Different international goals for climate protection demand solutions for more energy efficiency in the operation of structural systems and buildings, but also the consideration of climate-relevant factors associated with the entire life cycle. The importance of sustainable construction has increased significantly in recent years. The life cycle assessment of components and buildings over their entire life cycle, from manufacturing and dismantling to any necessary disposal or recycling, plays a considerable role here.

Massive concrete components are important in life cycle assessments because of their cement content. If parts of the concrete can be substituted by other, less environmentally effective components, the resulting savings are of great importance.

The Unidome void former slab replaces part of the concrete with air and allows the designer to generate a slimmer concrete slab with a significantly lower weight per unit area, with almost unchanged properties. In multi-story buildings, the cumulative load reduction can bring additional potential savings in other structural components, such as the building's foundation.

From the point of view of sustainable construction, the Unidome void former slab represents an innovative and sustainable element.

Sources

OEKOBAU.DAT: 1.4.01 Mineral building products / Mortar and Concrete / Ready mixed concrete / C30-37. (03. 04. 2020-II).

OEKOBAU.DAT: 4.1.02 Metals / Steel and iron / Steel reinforcement mesh / Reinforcement steel. (03. 04. 2020/II).

OEKOBAU.DAT: 6.1.02 Plastics / Pipe / Sewer pipe / Sewer pipe PP. (03. 04. 2020/II).

OEKOBAU.DAT: 9.2.05 Others / Energy carrier - delivery free user / Electricity / Electricity grid mix 2015. (03. 04. 2020/II).

OEKOBAU.DAT: 9.3.01 Others / Transport of goods [t km] / Truck. (03. 04. 2020/II).

Attachment 1 – Data sheets

Data sheet 1: Environmental impact void formers XS60

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,18	10,200	55,000	65,200	39,420	1,07E-08	4,64E-03	5,71E-02	1,06E-02	
	A4-A5	Concrete C30/37	m³/m²	0,18	0,500	3,713	4,213	1,004	1,01E-12	-6,68E-04	2,34E-03	5,30E-04	
	A1-A3	Steel reinforcement	kg/m²	22,51	23,687	55,021	78,707	15,384	4,69E-13	5,99E-03	2,89E-02	3,93E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	22,51	0,014	0,227	0,240	0,061	2,78E-17	-4,97E-05	1,48E-04	3,53E-05	
	C1-C2	Concrete C30/37	m³/m²	0,18	0,690	10,245	10,935	2,718	5,36E-13	-1,43E-03	1,12E-02	2,55E-03	
	C3	Concrete C30/37	m³/m²	0,18	1,035	3,935	4,970	1,082	2,36E-12	1,75E-04	2,03E-03	3,91E-04	
	C1-C2	Steel reinforcement	kg/m²	22,51	0,017	0,295	0,312	0,079	2,61E-17	-3,24E-05	1,83E-04	4,34E-05	
		Sum of all stages	per m²		36,142	128,435	164,577	59,748	1,08E-08	8,63E-03	1,02E-01	1,81E-02	
		Sum A1-A3 + C3	per m²		34,922	113,956	148,877	55,886	1,07E-08	1,08E-02	8,80E-02	1,50E-02	
Part B: Void formers XS 60 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 60
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	2,94	0,916	1,816	2,731	0,493	1,74E-14	2,82E-06	7,12E-04	1,35E-04	
	A4	Void formers (2000 km)	kg/m²	2,94	0,118	1,971	2,089	0,527	2,42E-16	-4,32E-04	1,28E-03	3,07E-04	
	C2	Void formers	kg/m²	2,94	0,000	0,008	0,009	0,002	7,45E-19	-1,48E-06	4,54E-06	1,08E-06	
	C3	Void formers	kg/m²	2,94	0,028	0,136	0,164	3,044	5,71E-16	2,01E-05	2,75E-04	6,20E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,034	-1,898	-10,236	-12,134	-7,337	-2,00E-09	-8,64E-04	-1,06E-02	-1,98E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,034	-0,093	-0,691	-0,784	-0,187	-1,87E-13	1,24E-04	-4,36E-04	-9,87E-05	
	A1-A3	Steel reinforcement saving	kg/m²	-0,31	-0,323	-0,750	-1,073	-0,210	-6,40E-15	-8,17E-05	-3,94E-04	-5,35E-05	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-0,31	0,000	-0,003	-0,003	-0,001	-3,80E-19	6,77E-07	-2,01E-06	-4,82E-07	
	C1-C2	Concrete saving C30/37	m³/m²	-0,034	-0,128	-1,907	-2,035	-0,506	-9,98E-14	2,65E-04	-2,08E-03	-4,75E-04	
	C3	Concrete saving C30/37	m³/m²	-0,034	-0,193	-0,732	-0,925	-0,201	-4,39E-13	-3,26E-05	-3,79E-04	-7,27E-05	
	C1-C2	Steel reinforcement saving	kg/m²	-0,31	0,000	-0,004	-0,004	-0,001	-3,57E-19	4,41E-07	-2,50E-06	-5,92E-07	
		Sum all stages	per m²		-1,574	-10,392	-11,966	-4,376	-2,00E-09	-9,99E-04	-1,16E-02	-2,18E-03	
		Sum A1-A3 + C3	per m²		-1,470	-9,767	-11,237	-4,211	-2,00E-09	-9,56E-04	-1,04E-02	-1,91E-03	

Data sheet 1: Environmental impact void formers XS80

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers
   (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,2	11,333	61,111	72,444	43,800	1,19E-08	5,16E-03	6,34E-02	1,18E-02	
	A4-A5	Concrete C30/37	m³/m²	0,2	0,555	4,126	4,681	1,116	1,12E-12	-7,42E-04	2,60E-03	5,89E-04	
	A1-A3	Steel reinforcement	kg/m²	25,02	26,321	61,141	87,462	17,095	5,22E-13	6,65E-03	3,21E-02	4,36E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	25,02	0,015	0,252	0,267	0,067	3,09E-17	-5,52E-05	1,64E-04	3,92E-05	
	C1-C2	Concrete C30/37	m³/m²	0,2	0,767	11,383	12,150	3,020	5,96E-13	-1,58E-03	1,24E-02	2,84E-03	
	C3	Concrete C30/37	m³/m²	0,2	1,150	4,372	5,522	1,202	2,62E-12	1,95E-04	2,26E-03	4,34E-04	
	C1-C2	Steel reinforcement	kg/m²	25,02	0,019	0,328	0,347	0,088	2,91E-17	-3,60E-05	2,03E-04	4,82E-05	
		Sum of all stages	per m²		40,160	142,713	182,873	66,388	1,19E-08	9,59E-03	1,13E-01	2,01E-02	
		Sum A1-A3 + C3	per m²		38,805	126,624	165,429	62,097	1,19E-08	1,20E-02	9,77E-02	1,66E-02	
Part B: Void formers XS 80 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 80
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	3,06	0,916	1,824	2,740	0,495	1,74E-14	1,02E-06	7,18E-04	1,36E-04	
	A4	Void formers (2000 km)	kg/m²	3,06	0,123	2,054	2,176	0,549	2,52E-16	-4,50E-04	1,34E-03	3,20E-04	
	C2	Void formers	kg/m²	3,06	0,001	0,009	0,009	0,002	7,76E-19	-1,55E-06	4,73E-06	1,13E-06	
	C3	Void formers	kg/m²	3,06	0,029	0,142	0,171	3,171	5,95E-16	2,10E-05	2,86E-04	6,46E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,044	-2,510	-13,536	-16,046	-9,702	-2,64E-09	-1,14E-03	-1,40E-02	-2,62E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,044	-0,123	-0,914	-1,037	-0,247	-2,48E-13	1,64E-04	-5,76E-04	-1,31E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-0,68	-0,710	-1,650	-2,360	-0,461	-1,41E-14	-1,80E-04	-8,65E-04	-1,18E-04	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-0,68	0,000	-0,007	-0,007	-0,002	-8,35E-19	1,49E-06	-4,42E-06	-1,06E-06	
	C1-C2	Concrete saving C30/37	m³/m²	-0,044	-0,170	-2,521	-2,691	-0,669	-1,32E-13	3,51E-04	-2,75E-03	-6,28E-04	
	C3	Concrete saving C30/37	m³/m²	-0,044	-0,255	-0,968	-1,223	-0,266	-5,80E-13	-4,31E-05	-5,01E-04	-9,61E-05	
	C1-C2	Steel reinforcement saving	kg/m²	-0,68	-0,001	-0,009	-0,009	-0,002	-7,84E-19	9,70E-07	-5,49E-06	-1,30E-06	
		Sum all stages	per m²		-2,700	-15,577	-18,277	-7,132	-2,65E-09	-1,28E-03	-1,64E-02	-3,07E-03	
		Sum A1-A3 + C3	per m²		-2,530	-14,189	-16,719	-6,763	-2,65E-09	-1,34E-03	-1,44E-02	-2,63E-03	

Data sheet 2: Environmental impact void formers XS100

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,22	12,467	67,222	79,689	48,180	1,31E-08	5,68E-03	6,97E-02	1,30E-02	
	A4-A5	Concrete C30/37	m³/m²	0,22	0,611	4,538	5,149	1,228	1,23E-12	-8,16E-04	2,86E-03	6,48E-04	
	A1-A3	Steel reinforcement	kg/m²	27,49	28,923	67,185	96,109	18,785	5,73E-13	7,31E-03	3,52E-02	4,79E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	27,49	0,017	0,277	0,293	0,074	3,40E-17	-6,06E-05	1,80E-04	4,31E-05	
	C1-C2	Concrete C30/37	m³/m²	0,22	0,843	12,522	13,365	3,322	6,55E-13	-1,74E-03	1,37E-02	3,12E-03	
	C3	Concrete C30/37	m³/m²	0,22	1,265	4,809	6,074	1,322	2,88E-12	2,14E-04	2,49E-03	4,77E-04	
	C1-C2	Steel reinforcement	kg/m²	27,49	0,021	0,360	0,381	0,096	3,19E-17	-3,95E-05	2,24E-04	5,30E-05	
		Sum of all stages	per m²		44,146	156,914	201,060	73,007	1,31E-08	1,05E-02	1,24E-01	2,21E-02	
		Sum A1-A3 + C3	per m²		42,655	139,217	181,872	68,287	1,31E-08	1,32E-02	1,07E-01	1,83E-02	
Part B: Void formers XS 100 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 100
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	3,18	0,917	1,832	2,749	0,497	1,74E-14	-7,84E-07	7,23E-04	1,38E-04	
	A4	Void formers (2000 km)	kg/m²	3,18	0,128	2,136	2,263	0,571	2,62E-16	-4,68E-04	1,39E-03	3,33E-04	
	C2	Void formers	kg/m²	3,18	0,001	0,009	0,010	0,002	8,07E-19	-1,61E-06	4,92E-06	1,17E-06	
	C3	Void formers	kg/m²	3,18	0,030	0,148	0,178	3,298	6,19E-16	2,18E-05	2,98E-04	6,71E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,055	-3,122	-16,836	-19,958	-12,067	-3,29E-09	-1,42E-03	-1,75E-02	-3,26E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,055	-0,153	-1,137	-1,289	-0,307	-3,08E-13	2,04E-04	-7,16E-04	-1,62E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-1,12	-1,178	-2,737	-3,916	-0,765	-2,34E-14	-2,98E-04	-1,44E-03	-1,95E-04	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-1,12	-0,001	-0,011	-0,012	-0,003	-1,38E-18	2,47E-06	-7,34E-06	-1,76E-06	
	C1-C2	Concrete saving C30/37	m³/m²	-0,055	-0,211	-3,136	-3,347	-0,832	-1,64E-13	4,36E-04	-3,42E-03	-7,81E-04	
	C3	Concrete saving C30/37	m³/m²	-0,055	-0,317	-1,205	-1,521	-0,331	-7,22E-13	-5,37E-05	-6,23E-04	-1,20E-04	
	C1-C2	Steel reinforcement saving	kg/m²	-1,12	-0,001	-0,015	-0,016	-0,004	-1,30E-18	1,61E-06	-9,11E-06	-2,16E-06	
		Sum all stages	per m²		-3,908	-20,952	-24,860	-9,941	-3,29E-09	-1,58E-03	-2,13E-02	-3,98E-03	
		Sum A1-A3 + C3	per m²		-3,671	-18,798	-22,469	-9,368	-3,29E-09	-1,75E-03	-1,85E-02	-3,37E-03	

Data sheet 3: Environmental impact void formers XS120

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,24	13,600	73,333	86,933	52,560	1,43E-08	6,19E-03	7,61E-02	1,42E-02	
	A4-A5	Concrete C30/37	m³/m²	0,24	0,666	4,951	5,617	1,339	1,34E-12	-8,90E-04	3,12E-03	7,07E-04	
	A1-A3	Steel reinforcement	kg/m²	30,13	31,702	73,640	105,343	20,590	6,28E-13	8,01E-03	3,86E-02	5,25E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	30,13	0,018	0,303	0,321	0,081	3,72E-17	-6,65E-05	1,97E-04	4,73E-05	
	C1-C2	Concrete C30/37	m³/m²	0,24	0,920	13,660	14,580	3,624	7,15E-13	-1,90E-03	1,49E-02	3,40E-03	
	C3	Concrete C30/37	m³/m²	0,24	1,380	5,247	6,627	1,442	3,14E-12	2,34E-04	2,71E-03	5,21E-04	
	C1-C2	Steel reinforcement	kg/m²	30,13	0,023	0,395	0,418	0,106	3,50E-17	-4,33E-05	2,45E-04	5,81E-05	
		Sum of all stages	per m²		48,310	171,529	219,838	79,742	1,43E-08	1,15E-02	1,36E-01	2,42E-02	
		Sum A1-A3 + C3	per m²		46,682	152,220	198,903	74,593	1,43E-08	1,44E-02	1,17E-01	2,00E-02	
Part B: Void formers XS 120 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 120
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	3,26	0,917	1,837	2,754	0,499	1,74E-14	-1,98E-06	7,27E-04	1,38E-04	
	A4	Void formers (2000 km)	kg/m²	3,26	0,131	2,191	2,321	0,585	2,69E-16	-4,80E-04	1,43E-03	3,41E-04	
	C2	Void formers	kg/m²	3,26	0,001	0,009	0,010	0,002	8,27E-19	-1,65E-06	5,05E-06	1,20E-06	
	C3	Void formers	kg/m²	3,26	0,031	0,151	0,183	3,382	6,35E-16	2,24E-05	3,06E-04	6,89E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,065	-3,695	-19,922	-23,617	-14,279	-3,89E-09	-1,68E-03	-2,07E-02	-3,85E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,065	-0,181	-1,345	-1,526	-0,364	-3,65E-13	2,42E-04	-8,48E-04	-1,92E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-1,72	-1,811	-4,206	-6,017	-1,176	-3,59E-14	-4,58E-04	-2,21E-03	-3,00E-04	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-1,72	-0,001	-0,017	-0,018	-0,005	-2,13E-18	3,80E-06	-1,13E-05	-2,70E-06	
	C1-C2	Concrete saving C30/37	m³/m²	-0,065	-0,250	-3,711	-3,961	-0,985	-1,94E-13	5,16E-04	-4,05E-03	-9,25E-04	
	C3	Concrete saving C30/37	m³/m²	-0,065	-0,375	-1,425	-1,800	-0,392	-8,54E-13	-6,35E-05	-7,37E-04	-1,41E-04	
	C1-C2	Steel reinforcement saving	kg/m²	-1,72	-0,001	-0,023	-0,024	-0,006	-2,00E-18	2,47E-06	-1,40E-05	-3,32E-06	
		Sum all stages	per m²		-5,234	-26,461	-31,695	-12,737	-3,89E-09	-1,90E-03	-2,61E-02	-4,87E-03	
		Sum A1-A3 + C3	per m²		-4,932	-23,565	-28,497	-11,966	-3,89E-09	-2,18E-03	-2,26E-02	-4,09E-03	

Data sheet 4: Environmental impact void formers XS140

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,26	14,733	79,444	94,178	56,940	1,55E-08	6,71E-03	8,24E-02	1,54E-02	
	A4-A5	Concrete C30/37	m³/m²	0,26	0,722	5,363	6,085	1,451	1,45E-12	-9,64E-04	3,38E-03	7,66E-04	
	A1-A3	Steel reinforcement	kg/m²	32,62	34,319	79,719	114,038	22,290	6,80E-13	8,68E-03	4,18E-02	5,69E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	32,62	0,020	0,328	0,348	0,088	4,03E-17	-7,20E-05	2,14E-04	5,12E-05	
	C1-C2	Concrete C30/37	m³/m²	0,26	0,997	14,798	15,795	3,926	7,75E-13	-2,06E-03	1,61E-02	3,69E-03	
	C3	Concrete C30/37	m³/m²	0,26	1,495	5,684	7,179	1,563	3,41E-12	2,53E-04	2,94E-03	5,64E-04	
	C1-C2	Steel reinforcement	kg/m²	32,62	0,025	0,427	0,452	0,114	3,79E-17	-4,69E-05	2,65E-04	6,29E-05	
		Sum of all stages	per m²		52,310	185,764	238,075	86,371	1,55E-08	1,25E-02	1,47E-01	2,62E-02	
		Sum A1-A3 + C3	per m²		50,548	164,847	215,395	80,792	1,55E-08	1,56E-02	1,27E-01	2,16E-02	
Part B: Void formers XS 140 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 140
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	3,35	0,917	1,843	2,760	0,500	1,74E-14	-3,18E-06	7,30E-04	1,39E-04	
	A4	Void formers (2000 km)	kg/m²	3,35	0,134	2,245	2,379	0,600	2,76E-16	-4,92E-04	1,46E-03	3,50E-04	
	C2	Void formers	kg/m²	3,35	0,001	0,010	0,010	0,003	8,48E-19	-1,69E-06	5,18E-06	1,23E-06	
	C3	Void formers	kg/m²	3,35	0,032	0,155	0,187	3,467	6,51E-16	2,29E-05	3,13E-04	7,06E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,075	-4,267	-23,008	-27,275	-16,491	-4,50E-09	-1,94E-03	-2,39E-02	-4,45E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,075	-0,209	-1,553	-1,762	-0,420	-4,21E-13	2,79E-04	-9,79E-04	-2,22E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-2,22	-2,332	-5,416	-7,748	-1,514	-4,62E-14	-5,89E-04	-2,84E-03	-3,86E-04	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-2,22	-0,001	-0,022	-0,024	-0,006	-2,74E-18	4,89E-06	-1,45E-05	-3,48E-06	
	C1-C2	Concrete saving C30/37	m³/m²	-0,075	-0,289	-4,286	-4,574	-1,137	-2,24E-13	5,96E-04	-4,68E-03	-1,07E-03	
	C3	Concrete saving C30/37	m³/m²	-0,075	-0,433	-1,646	-2,079	-0,453	-9,86E-13	-7,33E-05	-8,51E-04	-1,63E-04	
	C1-C2	Steel reinforcement saving	kg/m²	-2,22	-0,002	-0,029	-0,031	-0,008	-2,57E-18	3,18E-06	-1,80E-05	-4,27E-06	
		Sum all stages	per m²		-6,448	-31,708	-38,156	-15,459	-4,50E-09	-2,20E-03	-3,07E-02	-5,74E-03	
		Sum A1-A3 + C3	per m²		-6,082	-28,073	-34,155	-14,491	-4,50E-09	-2,59E-03	-2,65E-02	-4,79E-03	

Data sheet 5: Environmental impact void formers XS160

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,28	15,867	85,556	101,422	61,320	1,67E-08	7,22E-03	8,88E-02	1,65E-02	
	A4-A5	Concrete C30/37	m³/m²	0,28	0,777	5,776	6,553	1,562	1,57E-12	-1,04E-03	3,64E-03	8,25E-04	
	A1-A3	Steel reinforcement	kg/m²	35,10	36,937	85,800	122,737	23,990	7,32E-13	9,34E-03	4,50E-02	6,12E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	35,10	0,021	0,353	0,374	0,094	4,34E-17	-7,74E-05	2,30E-04	5,51E-05	
	C1-C2	Concrete C30/37	m³/m²	0,28	1,073	15,937	17,010	4,228	8,34E-13	-2,22E-03	1,74E-02	3,97E-03	
	C3	Concrete C30/37	m³/m²	0,28	1,610	6,121	7,731	1,683	3,67E-12	2,73E-04	3,16E-03	6,08E-04	
	C1-C2	Steel reinforcement	kg/m²	35,10	0,027	0,460	0,487	0,123	4,08E-17	-5,05E-05	2,86E-04	6,77E-05	
		Sum of all stages	per m²		56,312	200,002	256,314	93,001	1,67E-08	1,35E-02	1,58E-01	2,82E-02	
		Sum A1-A3 + C3	per m²		54,414	177,477	231,891	86,993	1,67E-08	1,68E-02	1,37E-01	2,33E-02	
Part B: Void formers XS 160 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 160
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	3,43	0,918	1,848	2,766	0,502	1,74E-14	-4,38E-06	7,34E-04	1,40E-04	
	A4	Void formers (2000 km)	kg/m²	3,43	0,137	2,300	2,437	0,615	2,82E-16	-5,04E-04	1,50E-03	3,58E-04	
	C2	Void formers	kg/m²	3,43	0,001	0,010	0,010	0,003	8,69E-19	-1,73E-06	5,30E-06	1,26E-06	
	C3	Void formers	kg/m²	3,43	0,033	0,159	0,192	3,551	6,67E-16	2,35E-05	3,21E-04	7,23E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,084	-4,743	-25,575	-30,318	-18,330	-5,00E-09	-2,16E-03	-2,65E-02	-4,95E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,084	-0,232	-1,727	-1,959	-0,467	-4,68E-13	3,10E-04	-1,09E-03	-2,47E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-2,82	-2,967	-6,893	-9,860	-1,927	-5,88E-14	-7,50E-04	-3,62E-03	-4,92E-04	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-2,82	-0,002	-0,028	-0,030	-0,008	-3,49E-18	6,22E-06	-1,85E-05	-4,42E-06	
	C1-C2	Concrete saving C30/37	m³/m²	-0,084	-0,321	-4,764	-5,085	-1,264	-2,49E-13	6,63E-04	-5,20E-03	-1,19E-03	
	C3	Concrete saving C30/37	m³/m²	-0,084	-0,481	-1,830	-2,311	-0,503	-1,10E-12	-8,15E-05	-9,46E-04	-1,82E-04	
	C1-C2	Steel reinforcement saving	kg/m²	-2,82	-0,002	-0,037	-0,039	-0,010	-3,28E-18	4,05E-06	-2,29E-05	-5,44E-06	
		Sum all stages	per m²		-7,660	-36,536	-44,196	-17,838	-5,00E-09	-2,49E-03	-3,49E-02	-6,49E-03	
		Sum A1-A3 + C3	per m²		-7,241	-32,290	-39,531	-16,707	-5,00E-09	-2,97E-03	-3,00E-02	-5,41E-03	

Data sheet 6: Environmental impact void formers XS180

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,3	17,000	91,667	108,667	65,700	1,79E-08	7,74E-03	9,51E-02	1,77E-02	
	A4-A5	Concrete C30/37	m³/m²	0,3	0,833	6,188	7,021	1,674	1,68E-12	-1,11E-03	3,90E-03	8,84E-04	
	A1-A3	Steel reinforcement	kg/m²	37,88	39,859	92,587	132,447	25,888	7,90E-13	1,01E-02	4,86E-02	6,61E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	37,88	0,023	0,381	0,404	0,102	4,68E-17	-8,36E-05	2,48E-04	5,94E-05	
	C1-C2	Concrete C30/37	m³/m²	0,3	1,150	17,075	18,225	4,530	8,94E-13	-2,38E-03	1,86E-02	4,25E-03	
	C3	Concrete C30/37	m³/m²	0,3	1,725	6,558	8,283	1,803	3,93E-12	2,92E-04	3,39E-03	6,51E-04	
	C1-C2	Steel reinforcement	kg/m²	37,88	0,029	0,496	0,525	0,133	4,40E-17	-5,44E-05	3,08E-04	7,31E-05	
		Sum of all stages	per m²		60,618	214,953	275,572	99,830	1,79E-08	1,45E-02	1,70E-01	3,03E-02	
		Sum A1-A3 + C3	per m²		58,584	190,812	249,397	93,391	1,79E-08	1,81E-02	1,47E-01	2,50E-02	
Part B: Void formers XS 180 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 180
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	3,51	0,918	1,854	2,772	0,503	1,74E-14	-5,59E-06	7,37E-04	1,41E-04	
	A4	Void formers (2000 km)	kg/m²	3,51	0,141	2,355	2,496	0,629	2,89E-16	-5,16E-04	1,53E-03	3,67E-04	
	C2	Void formers	kg/m²	3,51	0,001	0,010	0,011	0,003	8,89E-19	-1,77E-06	5,43E-06	1,29E-06	
	C3	Void formers	kg/m²	3,51	0,033	0,163	0,196	3,636	6,82E-16	2,40E-05	3,28E-04	7,40E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,094	-5,315	-28,661	-33,976	-20,542	-5,60E-09	-2,42E-03	-2,97E-02	-5,54E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,094	-0,260	-1,935	-2,195	-0,523	-5,24E-13	3,48E-04	-1,22E-03	-2,76E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-3,70	-3,894	-9,046	-12,940	-2,529	-7,72E-14	-9,84E-04	-4,74E-03	-6,45E-04	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-3,70	-0,002	-0,037	-0,039	-0,010	-4,58E-18	8,17E-06	-2,43E-05	-5,81E-06	
	C1-C2	Concrete saving C30/37	m³/m²	-0,094	-0,360	-5,339	-5,698	-1,416	-2,79E-13	7,43E-04	-5,82E-03	-1,33E-03	
	C3	Concrete saving C30/37	m³/m²	-0,094	-0,539	-2,051	-2,590	-0,564	-1,23E-12	-9,14E-05	-1,06E-03	-2,04E-04	
	C1-C2	Steel reinforcement saving	kg/m²	-3,70	-0,003	-0,048	-0,051	-0,013	-4,30E-18	5,32E-06	-3,01E-05	-7,14E-06	
		Sum all stages	per m²		-9,281	-42,735	-52,017	-20,827	-5,60E-09	-2,89E-03	-4,00E-02	-7,43E-03	
		Sum A1-A3 + C3	per m²		-8,797	-37,741	-46,538	-19,496	-5,60E-09	-3,48E-03	-3,45E-02	-6,18E-03	

Data sheet 7: Environmental impact void formers XS200

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,32	18,133	97,778	115,911	70,080	1,91E-08	8,26E-03	1,01E-01	1,89E-02	
	A4-A5	Concrete C30/37	m³/m²	0,32	0,888	6,601	7,489	1,786	1,79E-12	-1,19E-03	4,16E-03	9,43E-04	
	A1-A3	Steel reinforcement	kg/m²	40,39	42,494	98,708	141,202	27,599	8,42E-13	1,07E-02	5,18E-02	7,04E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	40,39	0,024	0,407	0,431	0,109	4,99E-17	-8,91E-05	2,65E-04	6,34E-05	
	C1-C2	Concrete C30/37	m³/m²	0,32	1,227	18,213	19,440	4,832	9,53E-13	-2,53E-03	1,99E-02	4,54E-03	
	C3	Concrete C30/37	m³/m²	0,32	1,840	6,996	8,836	1,923	4,19E-12	3,12E-04	3,62E-03	6,94E-04	
	C1-C2	Steel reinforcement	kg/m²	40,39	0,031	0,529	0,560	0,142	4,69E-17	-5,80E-05	3,28E-04	7,79E-05	
		Sum of all stages	per m²		64,637	229,231	293,868	106,470	1,91E-08	1,54E-02	1,81E-01	3,23E-02	
		Sum A1-A3 + C3	per m²		62,467	203,481	265,948	99,602	1,91E-08	1,93E-02	1,57E-01	2,66E-02	
Part B: Void formers XS 200 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 200
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	3,71	0,919	1,868	2,786	0,507	1,74E-14	-8,59E-06	7,46E-04	1,43E-04	
	A4	Void formers (2000 km)	kg/m²	3,71	0,149	2,492	2,641	0,666	3,06E-16	-5,46E-04	1,62E-03	3,88E-04	
	C2	Void formers	kg/m²	3,71	0,001	0,011	0,011	0,003	9,41E-19	-1,88E-06	5,74E-06	1,37E-06	
	C3	Void formers	kg/m²	3,71	0,035	0,172	0,208	3,847	7,22E-16	2,54E-05	3,48E-04	7,83E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,101	-5,723	-30,861	-36,584	-22,119	-6,03E-09	-2,61E-03	-3,20E-02	-5,97E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,101	-0,280	-2,083	-2,364	-0,564	-5,65E-13	3,75E-04	-1,31E-03	-2,98E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-4,42	-4,648	-10,796	-15,444	-3,019	-9,21E-14	-1,17E-03	-5,66E-03	-7,70E-04	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-4,42	-0,003	-0,044	-0,047	-0,012	-5,46E-18	9,74E-06	-2,90E-05	-6,93E-06	
	C1-C2	Concrete saving C30/37	m³/m²	-0,101	-0,387	-5,749	-6,136	-1,525	-3,01E-13	8,00E-04	-6,27E-03	-1,43E-03	
	C3	Concrete saving C30/37	m³/m²	-0,101	-0,581	-2,208	-2,789	-0,607	-1,32E-12	-9,84E-05	-1,14E-03	-2,19E-04	
	C1-C2	Steel reinforcement saving	kg/m²	-4,42	-0,003	-0,058	-0,061	-0,015	-5,13E-18	6,35E-06	-3,59E-05	-8,52E-06	
		Sum all stages	per m²		-10,521	-47,257	-57,779	-22,838	-6,03E-09	-3,22E-03	-4,37E-02	-8,09E-03	
		Sum A1-A3 + C3	per m²		-9,997	-41,825	-51,823	-21,390	-6,03E-09	-3,86E-03	-3,77E-02	-6,74E-03	

Data sheet 8: Environmental impact void formers XS220

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,35	19,833	106,944	126,778	76,650	2,09E-08	9,03E-03	1,11E-01	2,07E-02	
	A4-A5	Concrete C30/37	m³/m²	0,35	0,971	7,220	8,191	1,953	1,96E-12	-1,30E-03	4,55E-03	1,03E-03	
	A1-A3	Steel reinforcement	kg/m²	44,43	46,747	108,587	155,334	30,361	9,26E-13	1,18E-02	5,70E-02	7,75E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	44,43	0,027	0,447	0,474	0,120	5,49E-17	-9,80E-05	2,91E-04	6,97E-05	
	C1-C2	Concrete C30/37	m³/m²	0,35	1,342	19,921	21,263	5,285	1,04E-12	-2,77E-03	2,17E-02	4,96E-03	
	C3	Concrete C30/37	m³/m²	0,35	2,013	7,651	9,664	2,104	4,59E-12	3,41E-04	3,96E-03	7,60E-04	
	C1-C2	Steel reinforcement	kg/m²	44,43	0,034	0,582	0,616	0,156	5,16E-17	-6,39E-05	3,61E-04	8,57E-05	
		Sum of all stages	per m²		70,966	251,353	322,319	116,628	2,09E-08	1,70E-02	1,99E-01	3,53E-02	
		Sum A1-A3 + C3	per m²		68,593	223,183	291,776	109,115	2,09E-08	2,12E-02	1,72E-01	2,92E-02	
Part B: Void formers XS 220 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 220
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	3,92	0,920	1,881	2,801	0,511	1,74E-14	-1,16E-05	7,55E-04	1,45E-04	
	A4	Void formers (2000 km)	kg/m²	3,92	0,157	2,629	2,786	0,703	3,23E-16	-5,76E-04	1,71E-03	4,10E-04	
	C2	Void formers	kg/m²	3,92	0,001	0,011	0,012	0,003	9,93E-19	-1,98E-06	6,06E-06	1,44E-06	
	C3	Void formers	kg/m²	3,92	0,037	0,182	0,219	4,059	7,62E-16	2,68E-05	3,67E-04	8,26E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,112	-6,364	-34,314	-40,678	-24,594	-6,70E-09	-2,90E-03	-3,56E-02	-6,64E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,112	-0,312	-2,316	-2,628	-0,627	-6,28E-13	4,17E-04	-1,46E-03	-3,31E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-5,63	-5,921	-13,753	-19,674	-3,845	-1,17E-13	-1,50E-03	-7,21E-03	-9,81E-04	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-5,63	-0,003	-0,057	-0,060	-0,015	-6,96E-18	1,24E-05	-3,69E-05	-8,83E-06	
	C1-C2	Concrete saving C30/37	m³/m²	-0,112	-0,430	-6,392	-6,822	-1,696	-3,35E-13	8,89E-04	-6,97E-03	-1,59E-03	
	C3	Concrete saving C30/37	m³/m²	-0,112	-0,646	-2,455	-3,101	-0,675	-1,47E-12	-1,09E-04	-1,27E-03	-2,44E-04	
	C1-C2	Steel reinforcement saving	kg/m²	-5,63	-0,004	-0,074	-0,078	-0,020	-6,54E-18	8,09E-06	-4,58E-05	-1,09E-05	
		Sum all stages	per m²		-12,565	-54,658	-67,223	-26,196	-6,71E-09	-3,74E-03	-4,98E-02	-9,17E-03	
		Sum A1-A3 + C3	per m²		-11,973	-48,459	-60,432	-24,545	-6,71E-09	-4,49E-03	-4,30E-02	-7,63E-03	

Data sheet 9: Environmental impact void formers XS240

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,38	21,533	116,111	137,644	83,220	2,27E-08	9,80E-03	1,20E-01	2,25E-02	
	A4-A5	Concrete C30/37	m³/m²	0,38	1,055	7,839	8,893	2,120	2,12E-12	-1,41E-03	4,94E-03	1,12E-03	
	A1-A3	Steel reinforcement	kg/m²	48,22	50,737	117,855	168,592	32,953	1,01E-12	1,28E-02	6,18E-02	8,41E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	48,22	0,029	0,485	0,514	0,130	5,96E-17	-1,06E-04	3,16E-04	7,56E-05	
	C1-C2	Concrete C30/37	m³/m²	0,38	1,457	21,628	23,085	5,738	1,13E-12	-3,01E-03	2,36E-02	5,39E-03	
	C3	Concrete C30/37	m³/m²	0,38	2,185	8,307	10,492	2,284	4,98E-12	3,70E-04	4,29E-03	8,25E-04	
	C1-C2	Steel reinforcement	kg/m²	48,22	0,037	0,632	0,668	0,169	5,60E-17	-6,93E-05	3,92E-04	9,30E-05	
		Sum of all stages	per m²		77,032	272,858	349,890	126,614	2,27E-08	1,84E-02	2,16E-01	3,84E-02	
		Sum A1-A3 + C3	per m²		74,455	242,274	316,729	118,457	2,27E-08	2,30E-02	1,87E-01	3,17E-02	
Part B: Void formers XS 240 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 240
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	4,16	0,921	1,898	2,818	0,515	1,74E-14	-1,52E-05	7,66E-04	1,48E-04	
	A4	Void formers (2000 km)	kg/m²	4,16	0,167	2,793	2,960	0,747	3,43E-16	-6,12E-04	1,82E-03	4,35E-04	
	C2	Void formers	kg/m²	4,16	0,001	0,012	0,013	0,003	1,05E-18	-2,10E-06	6,44E-06	1,53E-06	
	C3	Void formers	kg/m²	4,16	0,040	0,193	0,233	4,312	8,09E-16	2,85E-05	3,90E-04	8,78E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,120	-6,772	-36,514	-43,286	-26,171	-7,13E-09	-3,08E-03	-3,79E-02	-7,06E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,120	-0,332	-2,465	-2,797	-0,667	-6,68E-13	4,43E-04	-1,55E-03	-3,52E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-6,72	-7,070	-16,422	-23,492	-4,592	-1,40E-13	-1,79E-03	-8,61E-03	-1,17E-03	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-6,72	-0,004	-0,068	-0,072	-0,018	-8,31E-18	1,48E-05	-4,40E-05	-1,05E-05	
	C1-C2	Concrete saving C30/37	m³/m²	-0,120	-0,458	-6,802	-7,260	-1,804	-3,56E-13	9,46E-04	-7,42E-03	-1,69E-03	
	C3	Concrete saving C30/37	m³/m²	-0,120	-0,687	-2,612	-3,300	-0,718	-1,57E-12	-1,16E-04	-1,35E-03	-2,59E-04	
	C1-C2	Steel reinforcement saving	kg/m²	-6,72	-0,005	-0,088	-0,093	-0,024	-7,80E-18	9,66E-06	-5,46E-05	-1,30E-05	
		Sum all stages	per m²		-14,200	-60,075	-74,275	-28,416	-7,14E-09	-4,17E-03	-5,39E-02	-9,89E-03	
		Sum A1-A3 + C3	per m²		-13,568	-53,458	-67,026	-26,653	-7,14E-09	-4,97E-03	-4,67E-02	-8,26E-03	

Data sheet 10: Environmental impact void formers XS260

Recommended procedure to consider the environmental impact of the Unidome void formers:

1. Balance the solid reinforced concrete slab as usual (Table Part A)
2. Selection of suitable void formers
3. Determination of the area covered with void formers (usually 60 - 70 % of the floor area)
4. Balance the deduction of the solid slab, using the values in table "Part B", considering the area covered with void formers

					Primary energy renewable	Primary energy non-renewable	Total primary energy	Global warming potential	Ozone depletion potential	Photochemical ozone creation potential	Acidification potential	Eutrophication potential	
					PERT	PENRT	PE total	GWP	ODP	POCP	AP	EP	
					[kWh/m²]	[kWh/m²]	[kWh/m²]	[kg CO_2-Äq./m²]	[kg CFC11-Äq./m²]	[kg Ethen-Äq./m²]	[kg SO_2-Äq./m²]	[kg PO_4^{3-}-Äq./m²]	
Part A: Solid reinforced concrete slab	Stages												Exemplary results for a solid reinforced concrete slab
	A1-A3	Concrete C30/37	m³/m²	0,4	22,667	122,222	144,889	87,600	2,39E-08	1,03E-02	1,27E-01	2,36E-02	
	A4-A5	Concrete C30/37	m³/m²	0,4	1,110	8,251	9,361	2,232	2,24E-12	-1,48E-03	5,20E-03	1,18E-03	
	A1-A3	Steel reinforcement	kg/m²	50,75	53,397	124,034	177,431	34,680	1,06E-12	1,35E-02	6,51E-02	8,85E-03	
	A4	Transportation of steel by truck (30 km)	kg/m²	50,75	0,031	0,511	0,541	0,137	6,27E-17	-1,12E-04	3,33E-04	7,96E-05	
	C1-C2	Concrete C30/37	m³/m²	0,4	1,533	22,767	24,300	6,040	1,19E-12	-3,17E-03	2,48E-02	5,67E-03	
	C3	Concrete C30/37	m³/m²	0,4	2,300	8,744	11,044	2,404	5,24E-12	3,90E-04	4,52E-03	8,68E-04	
	C1-C2	Steel reinforcement	kg/m²	50,75	0,039	0,665	0,703	0,178	5,89E-17	-7,29E-05	4,13E-04	9,79E-05	
		Sum of all stages	per m²		81,076	287,194	368,271	133,271	2,39E-08	1,94E-02	2,27E-01	4,04E-02	
		Sum A1-A3 + C3	per m²		78,364	255,001	333,365	124,684	2,39E-08	2,42E-02	1,96E-01	3,34E-02	
Part B: Void formers XS 260 - 100% coverage	Stages												Relevant "deduction" data for the Unidome slab for void formers XS 260
	A1-A3	Void formers (0,816 kWh/m²; 200 km)	kg/m²	4,41	0,922	1,914	2,836	0,519	1,74E-14	-1,88E-05	7,77E-04	1,50E-04	
	A4	Void formers (2000 km)	kg/m²	4,41	0,177	2,957	3,134	0,790	3,63E-16	-6,48E-04	1,93E-03	4,61E-04	
	C2	Void formers	kg/m²	4,41	0,001	0,013	0,013	0,003	1,12E-18	-2,23E-06	6,82E-06	1,62E-06	
	C3	Void formers	kg/m²	4,41	0,042	0,204	0,247	4,566	8,57E-16	3,02E-05	4,12E-04	9,30E-05	
	A1-A3	Concrete saving C30/37	m³/m²	-0,127	-7,168	-38,653	-45,821	-27,704	-7,55E-09	-3,26E-03	-4,01E-02	-7,48E-03	
	A4-A5	Concrete saving C30/37	m³/m²	-0,127	-0,351	-2,609	-2,960	-0,706	-7,07E-13	4,69E-04	-1,64E-03	-3,73E-04	
	A1-A3	Steel reinforcement saving	kg/m²	-7,51	-7,899	-18,348	-26,247	-5,130	-1,57E-13	-2,00E-03	-9,62E-03	-1,31E-03	
	A4	Transportation of steel by truck saving (30 km)	kg/m²	-7,51	-0,005	-0,076	-0,080	-0,020	-9,28E-18	1,66E-05	-4,92E-05	-1,18E-05	
	C1-C2	Concrete saving C30/37	m³/m²	-0,127	-0,485	-7,200	-7,685	-1,910	-3,77E-13	1,00E-03	-7,86E-03	-1,79E-03	
	C3	Concrete saving C30/37	m³/m²	-0,127	-0,727	-2,765	-3,493	-0,760	-1,66E-12	-1,23E-04	-1,43E-03	-2,75E-04	
	C1-C2	Steel reinforcement saving	kg/m²	-7,51	-0,006	-0,098	-0,104	-0,026	-8,72E-18	1,08E-05	-6,11E-05	-1,45E-05	
		Sum all stages	per m²		-15,500	-64,661	-80,161	-30,377	-7,55E-09	-4,52E-03	-5,76E-02	-1,05E-02	
		Sum A1-A3 + C3	per m²		-14,831	-57,648	-72,479	-28,509	-7,55E-09	-5,37E-03	-5,00E-02	-8,82E-03	

Attachment 2 – Exemplary calculation of the environmental impact of a Unidome slab

This exemplary calculation shows the environmental effects of a 40 cm thick Unidome void former slab. The structural calculation results in a coverage rate of 67% with void formers. For the sustainability assessment, the environmental impacts of all relevant life cycle stages are important.

Procedure:

1. Selection of the Unidome void former and the corresponding data sheet
   → Data sheet XS260

2. Extracting the environmental effects of the solid reinforced concrete slab (e.g. GWP)
   → GWP = 133,271 kg CO2 Equivalent/m²

3. Extracting the resulting deduction values for the Unidome slab. (e.g. GWP)
   → GWP = -30,377 kg CO2 Equivalent/m²

4. Determination of the environmental impacts for the Unidome slab with a coverage rate of 67% (the resulting value provides the mean value per m² slab area):
   → GWP = 133,271 – 0,67 · 30,377 = 112,918 kg CO2 Equivalent/m²

For the other environmental effects, proceed accordingly. If a different slab thickness is to be executed in connection with the void formers, here in example XS260, the data of the solid reinforced concrete slab must be extrapolated or interpolated between two data sheets. Alternatively, the data can also be calculated with other software-tools. The final values for the Unidome slab are obtained by adding the deduction values, according to step 3 of the procedure, which only depend on the type of Unidome void former to be used, but not on the slab thickness.