How we calculate the CO2-reduction potential of the elements from the Earth Sciences Building

The green column of the top table shows the weight of the element taken into account in the calculation. It is therefore not the full weight of the elements. In many cases, an assumption is made that approximately 50% of the released element can be reused in a high-quality manner. The other 50% will be disposed of and processed (e.g. recycled) in the normal - read: predetermined - way. The reason for this is because the material may contain chromium 6 or is damaged. Or because it is difficult to find a place for a second life, for example. See below for the assumptions as they are currently applied. On this basis we calculated the CO2 reduction potential.

nummer	element / component	materiaal	gewicht (kg)	MKI (euro totaal)	Forfaitair Hergebruik	Recycling	AVI	stort	verschil hergebruik (=onvoorzien hergebruik)	MKI oorsprong (deel her te gebruiken)	MKI aandeel A1-A3,C3,C4,D	hergebruikfactor	MKI A1-A3,C3,C4,D bij hergebruik	MKI A4, A5, B, C1 en C2	MKI met hergebruik	Theoretische milieuwinst (euro)	Theoretische CO2-winst (kg CO2-eq.)	MKI euro per kg	kg CO2-eq. per kg	CO2 bij kg totaal
111	Prefab beton gevelelementen	Beton+wapening	213600	3217	0%	99%	0%	1%	106800	1608,68	85%	20%	273,5	241,3	514,8	1093,9	12331,0	0,0151	0,1698	18133,75
121	Prefab beton trappen	Beton+wapening	86400	1375	0%	99%	0%	1%	43200	687,27	85%	20%	116,8	103,1	219,9	467,3	4628,9	0,0159	0,1576	6807,2727
211	Baksteen buitenmetselwek	Grofkeramisch	2910000	77650	0%	99%	0%	1%	1455000	38825,15		MKI en CO2-winst berekend (info NMD)			35228,1	299782,5	0,0267	0,2782	404846,62
221	Baksteen binnenwanden	Grofkeramisch	1552000	41413	0%	99%	0%	1%	776000	20706,75		MKI en CO2-winst berekend (info NMD)			18788,3	159884,0	0,0267	0,2782	215918,2
311	Staalconstructie profielen	staal	13700	486	5%	94%	0%	1%	6850	243,18	85%	20%	41,3	36,5	77,8	165,4	1963,3	0,0355	0,4215	2887,275
411	Houten binnenkozijnen	Hout	11760	0	0%	0%	95%	5%	0	0,00	85%	20%	0,0	0,0	0,0	0,0	0,0	0,0000	0,0000	0
511	Binnenwanden gipsplaten	Gipskartonplaat	100000	2171	0%	5%	0%	95%	50000	1085,54		MKI en CO2-winst berekend (info NMD)			966,1	7414,0	0,0217	0,2056	10282,478
611	Kabelgoten	Staal verzinkt	100	34	0%	95%	0%	5%	50	16,80		MKI en CO2-winst berekend (info NMD)			16,7	110,7	0,3360	2,7890	139,45128
711	Aluminium gevelkozijnen	Aluminium	100	50	0%	94%	3%	3%	50	25,00	85%	20%	4,3	3,8	8,0	17,0	103,8	0,5000	3,0536	152,67857
811	Isolatieglas	Vlakglas	100	14	0%	70%	0%	30%	50	6,92	85%	20%				6,8	45,3	0,1383	1,1518	57,59
1011	Plafondtegels glaswol	Glaswol	1125	241	0%	10%	5%	85%	563	120,60	85%		MKI en CO2-winst berekend (info NMD)			119,1	600,6	0,2144	1,3564	762,975

The first table (above) is to calculate the theoretical (potential) environmental gain and CO2 gain based on that weight.

project:	Utrecht, Aardwetenschappen UU										moet "0" zijn	REUSE: Element demonteren, afvoeren voor direct hergebruik		REPAIR: element demonteren, afvoeren, repareren voor hergebruik		REFURBISH: element demonteren, afvoeren, opknappen / moderniseren voor hergebruik		REMANUFACTURE: element demonteren, afvoeren en producten toepassen in element met dezelfde functie		REPURPOSE: element demonteren, afvoeren en producten toepassen in element met andere functie		TOTAAL HERGEBRUIK	Verschil t.o.v. forfaitair
datum:	4-mei-22																							
code	Naam onderdeel (element)	materiaal	Gewicht (kg)	Scenario MATERIAAL	Forfaitair Hergebruik	Recycling	AVI	Stort				R-4		R-5		R-6		R-7		R-8		kg	kg
1 1 1	Prefab beton gevelelementen	Beton+wapening	213600	8	0%	99%	0%	1%		0	50%	106800	0%	0	0%	0	0%	0	0%	0	106800	106800
1 2 1	Prefab beton trappen	Beton+wapening	86400	8	0%	99%	0%	1%		0	50%	43200	0%	0	0%	0	0%	0	0%	0	43200	43200
2 1 1	Baksteen buitenmetselwek	Grofkeramisch	2910000	32	0%	99%	0%	1%		0	50%	1455000	0%	0	0%	0	0%	0	0%	0	1455000	1455000
2 2 1	Baksteen binnenwanden	Grofkeramisch	1552000	32	0%	99%	0%	1%		0	50%	776000	0%	0	0%	0	0%	0	0%	0	776000	776000
3 1 1	Staalconstructie profielen	staal	13700	70	5%	94%	0%	1%		0	50%	6850	0%	0	0%	0	5%	685	0%	0	7535	6850
4 1 1	Houten binnenkozijnen	Hout	11760	36	0%	0%	95%	5%		0	0%	0	0%	0	0%	0	0%	0	0%	0	0	0
5 1 1	Binnenwanden gipsplaten	Gipskartonplaat	100000	27	0%	5%	0%	95%		0	50%	50000	0%	0	0%	0	0%	0	0%	0	50000	50000
6 1 1	Kabelgoten	Staal verzinkt	100	75	0%	95%	0%	5%		0	50%	50	0%	0	0%	0	0%	0	0%	0	50	50
7 1 1	Aluminium gevelkozijnen	Aluminium	100	4	0%	94%	3%	3%		0	50%	50	0%	0	0%	0	0%	0	0%	0	50	50
8 1 1	Isolatieglas	Vlakglas	100	28	0%	70%	0%	30%		0	50%	50	0%	0	0%	0	0%	0	0%	0	50	50

The second table (above) is to establish the assumption for the weight per product.

The calculation

In calculating the environmental costs and CO2 reductions, we use LCA data from the National Environmental Database (Nationale Milieudatabase) and a formula that, according to the National Environmental Database, can be used to calculate the environmental benefits of "unforeseen reuse". Unforeseen reuse thus refers to the reuse of elements (products) at product level, while normally recycling, incineration or landfill is involved. In that case you may apply a 'discount' on part of the total environmental costs (and carbon footprint) of the products concerned.

In part, we have been able to distil data from the National Environmental Database and in part from some tools used to calculate the environmental costs of construction (GPR building and the MRPI tool).

This way we calculated the theoretical environmental gain and CO2 gain (bold values in the first table), associated with the unforeseen reuse of the elements concerned and the corresponding kilograms (green column in the second table). These values in kilograms have yet to be made definitive.