

CO2 Performance Portfolio

CO2 Reduction in Projects

Reference: 074764-96-004

P02 | 3 May 2023

Redacted



©

This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 074764-96

Arup B.V.
Beta Building Naritaweg 118
1043 CA
Amsterdam
Netherlands
arup.com

Document Verification

Project title CO2 Performance Portfolio
Document title CO2 Reduction in Projects
Job number 074764-96
Document ref 074764-96-004
File reference CO2-portfolio_Project Report

Revision	Date	Filename	CO2-portfolio_Project Report		
P01	28/03/2023	Description	Reporting Period Jan to Dec 2022 – First Version		
			Prepared by	Checked by	Approved by
		Name	K Komarnyckyj	O Bate	T Salusbury
		Signature			
P02	03/05/2023	Filename			
		Description	Update for corrected FTE emissions		
			Prepared by	Checked by	Approved by
		Name	K Komarnyckyj	O Bate	T Salusbury
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			

Signature

Issue Document Verification with Document



Contents

1.	Introduction	1
1.1	Purpose of this Report	1
1.2	Organisation	1
2.	CO2 Reduction in Projects	1
2.1	Project Commitments and Schemes	1
2.2	Tools	2
3.	Projects Won with CO2 Performance Ladder	3
3.1	Projects won with CO2 Award Advantage	3
3.2	Projects won without CO2 Award Advantage	3
4.	CO2 Emissions on Projects	4

Tables

Table 1: Overview of CO2 emissions per project based on total number of project hours worked in 2022	4
--	---

Tables

Figure 1: Screenshot of IPP	2
Figure 2: Screenshot from Zero showing embodied and operation CO2 emissions	3

1. Introduction

1.1 Purpose of this Report

At Arup we aim to contribute towards a more sustainable future. Arup in the Netherlands has adopted the CO₂ Performance Ladder as a tool to map and reduce CO₂ emissions. The aims of the CO₂ Performance Ladder are in line with:

- Arup's Global Net Zero GHG Emission Statement;
- Arup's Global Net Zero Carbon Strategy; and
- Arup's Europe Region GHG Emissions Reduction Plan.

The targets in these documents are set until 2030 with a reference year of 2018.

Reporting within Arup is unusually based on the Arup Financial year which runs April to April. For the sake of CO₂ reporting, the data is reported on a standard calendar year. In this way the data collection is more aligned with standard practice of reporting in energy and mobility. The reporting period for this report is January 2022 until December 2022.

Measuring and reporting of the carbon footprint of our organisation is a fundamental first step in our action cycle. Our footprint is reported every year in accordance with the GHG-protocol and ISO 14064-1, as to comply with our CO₂ Performance ladder certification.

1.2 Organisation

Arup B.V. was established in the Netherlands, Amsterdam in 2001. From 2019 onwards the group leader has been Tudor Salusbury. The management structure was divided into the following three business units since 1st of April 2022:

- Sustainable Industries
- Sustainable Properties
- Sustainable Cities & Transport

2. CO₂ Reduction in Projects

2.1 Project Commitments and Schemes

Arup have made a number of commitments and schemes relating to CO₂ reduction in projects.

- **Whole Life Carbon buildings commitment** - From 2022, Arup have committed to undertake Whole Life Carbon Assessments (WLCA) for all buildings projects, both new and retrofit. Adopting these assessments is a crucial step that will allow the global buildings sector to progress towards a 50% carbon emissions reduction by 2030.
- **Milieu Kost Indicator (MKI) Calculations** – The Sustainable Cities & Transport team are carrying out MKI calculations for all live infrastructure projects. This will give us a set of reference data which can be applied to client projects. Currently MKI calculations have been carried out for the following projects:
 - 210035-00 MC Van Brienoord
 - 260258-00 GCB cable replacement and widening
 - 239230-00 MC Suurhoff VTW-250
 - 276718-00 Zuidasdok DO extension

- 276336-00 Suurhoff Rail bridge
- 264744-00 Waterlandseweg DO UO
- 286652-00 Kunstwerken A44 (Kaagbrug)
- A16 kunstwerken (misschien ook nog naar oude A6 kw'en kijken)
- De Locht fietsbrug
- Daniel den Hoed voetgangersbrug
- Passerelle Zwolle
- Molenbrug
- Rijnhernekanaal
- Rijnhernekanaal approaches
- A27 (Noord)

2.2 Tools

The following tools are available within Arup to monitor, report and reduce CO2-emissions on projects:

- Internal Project Plan (IPP) – IPP is mandatory for all projects. Managed by the PM and PD, it is where all project information is recorded. For projects with a fee over €150k, IPP records consideration of the UN Sustainable Development Goals (SDGs) in relation to the project and whether the environmental aspects of the project fall within Arup's influence. Environmental reviews are also recorded where applicable.

The screenshot shows the 'Setup & Administration' interface for an Internal Project Plan (IPP). The 'Plan setup' tab is active, displaying a form with several sections:

- Subcontractor:** External subcontractors? Yes; Other Arup Groups involved? No
- Design:** Design work Yes
- Health & Safety:** Full-time presence on-site No; Hazardous works No; Visit to site/non-office environment Yes; Remote and/or international travel No
- Environmental:** UN Sustainable Development Goals considered Yes; Environmental aspects within Arup's control or influence Yes (highlighted with a red box)
- Nominated Project Controls:** Inception review Yes; Design/Technical review Yes; Project Management review Yes; Close Out review Yes; Internal Project Audit Yes; Client Feedback Yes

Figure 1: Screenshot of IPP

- CRM – CRM is mandatory for all projects. Managed by the PM and PD, it is where all leads and opportunities are recorded. At the bidding stage, consideration is given to aspects of Sustainable Development relating to the project.
- Sustainability Overview Dashboard – As part of the Business Management dashboard, there is a Sustainability Overview which reports on environmental aspects from IPP. This gives Management an overview of the Sustainability aspects of all the projects carried out by Arup B.V.

- **Zero** - Zero is a digital platform designed to collect or estimate whole life carbon assessments for buildings projects. Whole Life carbon is a way of accounting for embodied carbon emissions arising from construction and replacement materials, and operational emissions associated with the energy and water used to run the building. Arup is currently working on developing Zero to include Infrastructure projects.

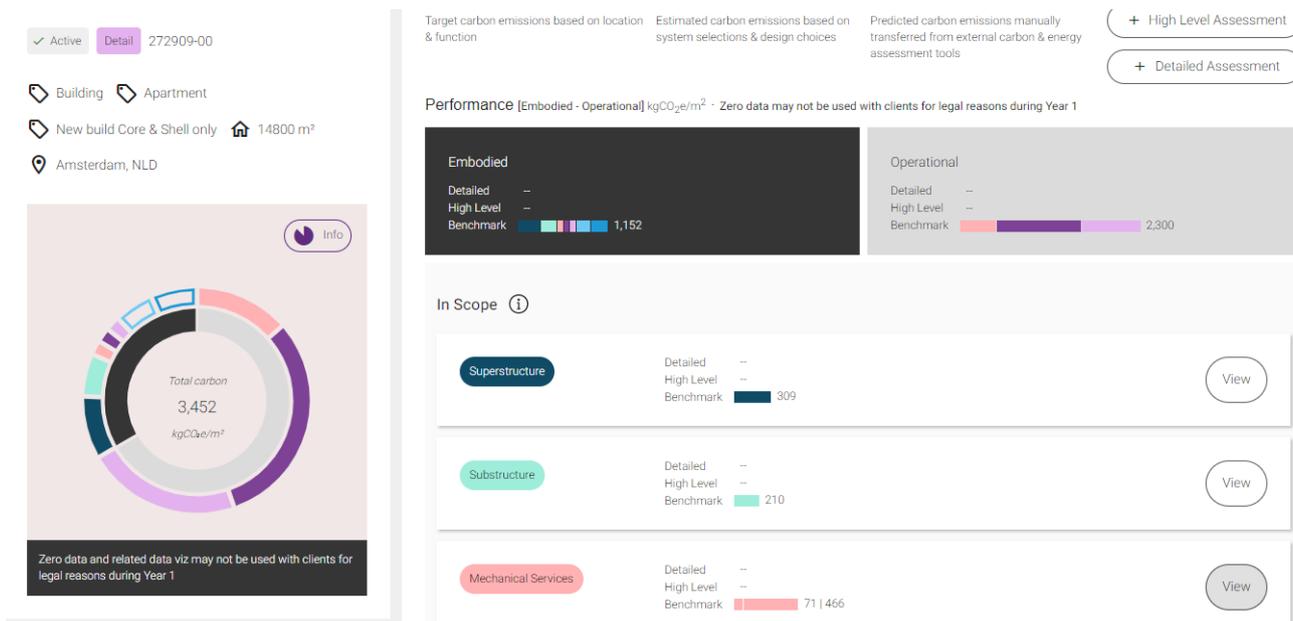


Figure 2: Screenshot from Zero showing embodied and operation CO2 emissions

- **Circular Buildings Toolkit** - CBT has been developed in partnership with the Ellen MacArthur Foundation to support designers, developers, construction firms as well as asset owners and operators make the transition to circular design. By enabling these groups to optimise their building(s) for circularity, it facilitates rapid, large-scale reductions in built environment greenhouse gas emissions.
- **Circular Economy (CE) tool** – the CE dashboard is a tool to compute and visualise the material impact of design variations on the environment. The tool is based on the methodology of the platform CB23. It has two usage cases, firstly it can be applied at a project level to assess different variations within the design process. It can also be used for a project without design variations to identify areas of the project that have the largest material impact. It was originally developed in 2021 and was greatly improved in 2022. For example, originally the dashboard was only applicable for new build projects but now it can be used for renovation projects too. The tool is primarily for use on infrastructure projects although it could be applied to other types of projects with a significant material impact.

3. Projects Won with CO2 Performance Ladder

3.1 Projects won with CO2 Award Advantage

Currently, none of our projects have been won with a CO2 Award Advantage.

3.2 Projects won without CO2 Award Advantage

A number of our projects require a minimum CO2 Performance Certificate Level 3, however there was no CO2 Award Advantage for these projects:

- Rijkswaterstaat SROK-ID Framework projects won with our JV partner Nebest who are certified CO2 Performance Ladder Level 3:
 - 292387-00 Herberekening 2 staalbetonbruggen en de Molenburg, December 2022 – December 2024
 - 279174-00 J.W. Topshuis, June 2021 - March 2023

- 281821-00 Herberekening Basculekelders, March 2021 – June 2023
- 284487-00 A4 Haaglanden circularity Advies, Oct 2021 – Jan 2022
- Rijkswaterstaat SROK-ID Framework project where Arup is a subconsultant:
 - 286652-00 Kunstwerken A44 (subconsultant of Arcadis), Jan 2022 – June 2023 (still running)
- Project- and Procesbeheersing framework project in which we are a subconsultant of Palladio-Nebest JV:
 - 285227-00 A1 Apeldoorn-Azelo, Jan 2022 – December 2024 (still running)

4. CO2 Emissions on Projects

Table 1 provides an overview of the CO2 emissions per project. The Energy Management Plan reports that in 2022, Arup B.V. produced 1,190kgCO2 per FTE in 2022 from Scope 1, 2 and 3 emissions. This can be converted into an hourly CO2 emission production of 0.63kgCO2/hr¹. Multiplying the project hours by this value gives the CO2 emissions per project.

In total Arup B.V. produced 145,514kgCO2 through project work in 2022.

It should be noted that this methodology makes the following assumptions or exclusions:

- Project specific travel – commuting and business travel is not allocated per project but spread evenly across all projects. This is not realistic but is a limitation of our current reporting methods.
- Business services – emissions relating to business services and other non-project specific hours are not allocated to projects.
- Overtime – if overtime hours have not been booked in the timesheet system then emissions as a result of staff overtime are not included in these figures.

Table 1: Overview of CO2 emissions per project based on total number of project hours worked in 2022

Project Number	Project Title	2022 Hours worked	CO2 Emissions in 2022 (kgCO2)
		40474	25504
		21767	13716
		10618	6691
		9832	6195
		7432	4683
		6779	4272
		5780	3642
		5521	3479

Redacted

¹ Annual hours worked by 1FTE = (40 hrs per week x 52 weeks) - 192 hrs of annual leave (taken from ovacode)

Project Number	Project Title	2022 Hours worked	CO2 Emissions in 2022 (kgCO2)
		5331	3359
		5239	3301
		5055	3185
		4700	2962
		4514	2845
		4285	2700
		4236	2669
		4176	2631
		4151	2615
		3974	2504
		3527	2222
		3074	1937
		3030	1909
		2449	1543
		2431	1532
		2321	1462
		2260	1424
		1942	1223
		1644	1036
		1634	1030
		1598	1007
		1576	993
		1469	925
		1404	884
		1213	764
		1169	736
		1152	726
		1097	691

Redacted

Project Number	Project Title	2022 Hours worked	CO2 Emissions in 2022 (kgCO2)
		1066	672
		1051	662
		1025	646
		1011	637
		988	622
		976	615
		971	612
		916	577
		903	569
		886	558
		863	544
		844	532
		806	508
		762	480
		752	474
		737	464
		728	459
		718	452
		703	443
		674	425
		667	420
		645	406
		631	398
		601	379
		590	372
		578	364
		562	354
		533	336

Redacted

Project Number	Project Title	2022 Hours worked	CO2 Emissions in 2022 (kgCO2)
		525	331
		485	305
		481	303
		460	290
		440	277
		433	273
		408	257
		376	237
		373	235
		371	234
		366	230
		357	225
		342	215
		338	213
		338	213
		335	211
		335	211
		331	209
		326	206
		310	195
		294	185
		291	183
		287	181
		276	174
		275	173
		270	170
		267	168
		267	168

Redacted

Project Number	Project Title	2022 Hours worked	CO2 Emissions in 2022 (kgCO2)
		264	167
		256	161
		253	159
		253	159
		246	155
		237	149
		220	139
		209	132
		207	130
		206	129
		200	126
		188	118
		184	116
		182	114
		181	114
		175	110
		172	108
		162	102
		160	101
		159	100
		156	98
		154	97
		149	94
		141	89
		138	87
		129	81
		127	80
		127	80

Redacted

Project Number	Project Title	2022 Hours worked	CO2 Emissions in 2022 (kgCO2)
		121	76
		121	76
		116	73
		112	71
		111	70
		110	69
		108	68
		107	68
		104	65
		99	62
		97	61
		94	59
		94	59
		94	59
		94	59
		94	59
		94	59
		93	59
		92	58
		91	57
		89	56
		85	54
		82	51
		81	51
		79	50
		79	50
		77	48
		75	47
		74	46

Redacted

Project Number	Project Title	2022 Hours worked	CO2 Emissions in 2022 (kgCO2)
		73	46
		67	42
		64	40
		64	40
		64	40
		63	40
		61	38
		60	38
		59	37
		59	37
		58	37
		58	36
		54	34
		53	33
		52	33
		52	33
		52	32
		52	32
		51	32
		50	31
		49	31
		46	29
		46	29
		45	29
		44	27
		43	27
		40	25
		38	24

Redacted

Project Number	Project Title	2022 Hours worked	CO2 Emissions in 2022 (kgCO2)
		36	22
		35	22
		33	21
		30	19
		30	19
		30	19
		29	18
		28	18
		27	17
		21	13
		18	11
		18	11
		16	10
		15	9
		14	9
		14	9
		13	8
		12	8
		10	6
		10	6
		10	6
		9	6
		8	5
		8	5
		8	5
		8	5
		7	4
		7	4

Redacted

Project Number	Project Title	2022 Hours worked	CO2 Emissions in 2022 (kgCO2)
		7	4
		7	4
		5	3
		5	3
		5	3
		3	2
		1	1
Total		230,928	145,514

Redacted