



Period January 1st, 2023 until June 30th, 2024

CO2 Progress and Energy Action Plan



Strukton

1 Introduction

This document reports on the developments at Strukton regarding the reduction of carbon emissions in the first six months of 2024 (January 1st – June 30th).

We contribute to the transition to a climate-neutral and circular economy through co-facilitating the energy transition, re-using materials, including and encouraging circularity and sustainability throughout the supply chain in which we operate, increasing the percentage of sustainable energy and making a positive ecological impact with our activities.

Results in the past

For over 10 years, Strukton has been certified at the highest level of the CO2 Performance Ladder. Following the successful reduction of our carbon footprint with 47% during the period 2009 - 2021, we've tightened our ambition for 2030. In the past, we reduced our CO2 emissions through a variety of measures. Regarding mobility, we have made adjustments in our car fleet (changing the standard from petrol to diesel-powered vehicles and promoting electric vehicles), enabled and encouraged the use of a mobility card for public transport (NS-business card), and promoted hybrid working, even after national COVID-19 regulations were loosened. Regarding our day-to-day operations, we closed down an (outdated) asphalt plant and implemented biofuels (e.g. HVO) for certain types of equipment. We also started initiatives to electrify equipment (retrofit), re-use materials and introduce circular design and production methods.

Goals and ambitions as of 2021

Due to several organisational changes, we expanded our organisational boundary to include our operations in Belgium, the Nordics (Sweden and Denmark) and Italy. This has led us to set 2021 as the new reference year (base year), as this was the first year data on carbon emissions was available for all different divisions. Our goal for reducing GHG emissions is set relative to our operating income. In the coming years, we expect to reduce our emission further through transitioning our fleet to electric vehicles, retrofitting our equipment to electric propulsion or the use of biofuels in cases where this is not feasible, and decreasing the impact of our work locations in terms of carbon emissions and energy consumption. Last but not least, all corporate divisions and portfolio subsidiaries are working on raising awareness among staff. These combined efforts should lead to a reduction in our own carbon emissions of 50% by 2030 compared to 2021. For Strukton as a whole (all home countries) this means that the tons of carbon emissions per million euros of revenue in 2030 should be no more than 12.68 tons (as opposed to 25,37 tons in 2021).

The 50% reduction goal by 2030 compared to 2021 is an ambitious milestone, with which Strukton contributes to achieving the goals as stated in the Paris Agreement (45% reduction by 2030 compared to 2010, and net zero in 2050).

For scope 3 emissions, our goal is to reduce carbon emissions in our value chain for the production and commissioning of (circular) concrete catenary supports by 55% in 2030 compared to 2023. Additionally, we aim to reduce carbon emissions in our value chain for the production of ballast and ballasting tracks by 50% in 2030 compared to 2023.

This periodic report is a part of the control cycle within the energy management system that has been introduced in the context of the CO2-Performance Ladder. This periodic report includes all matters described in §9.3.1 points a to t of the NEN-EN-ISO 14064-1:2018: Description of the Organisation (a), Responsible Persons (b), Reporting period (c), Organisational boundaries (d), Current calculation method and conversion factors (f, m, n, o, r, t), Uptake of CO2 (g, h), Biomass (f, g), Direct and indirect emissions

(i, j), Reference year (k, l), Changes in calculation method (k.), Exclusions (h), Recalculate base year and historical data (j, k), Uncertainties (p) and Verification (s).

2 Description of the organisation

We are a service provider in sustainable infrastructure, with a focus on green transport and electrification. We have developed a strong base in our home countries: Italy, Sweden, the Netherlands, Denmark and Belgium. It is with passion and energy that we combine over a century of craftsmanship with the latest technology and innovation. We prioritise safety, quality and sustainability. We develop and integrate new technologies and solutions and challenge customers to opt for contracts with room for sustainability and innovation. We are committed to operate with care and integrity and in a sustainable way and encourage our sector to do the same. We combine this approach with a focus on functionality, quality, life span and a good price-quality ratio.

2.1 Responsible officers

Name	Actors
Strukton Groep N.V.	Responsible assessment: Coen Veenboer
Portfolio Investment Holding B.V.	Responsible assessment: Coen Veenboer
Strukton Roads & Concrete	Responsible assessment: Abdelaziz Fifel
Strukton Infrastructure Specialties B.V.	Responsible assessment: Abdelaziz Fifel
Strukton Groep Enkelvoudig	Responsible assessment: Yvonne van de Biezen (Strukton Groep)
Strukton Power B.V.	Responsible assessment: Marcel van Kordelaar (SP)
Strukton Rail B.V.	Responsible assessment: Goitom Verseput
Strukton Rail Italy B.V.	Responsible assessment: Massimiliano Serci (CLF)
Strukton Rail Nordics	Responsible assessment: Carolina ÖOsterberg (SR Nordics)

2.2 Base year

Name	Default reference year
Strukton Groep N.V.	2021
Portfolio Investment Holding B.V.	2021
Strukton Roads & Concrete	2021
Strukton Infrastructure Specialties B.V.	2021
Strukton Power B.V.	2021
Strukton Rail B.V.	2021
Strukton Rail Italy B.V.	2022
Strukton Rail Nordics	2021

2.3 Reporting period

This report covers the period from January 01st, 2024 till June 30th, 2024.

2.4 Verification

The CO2 footprint in this document has not been verified by an (external) auditor. This happens once every year in line with the certification audit by an external certifying body (CI).

3 Demarcation

3.1 Organisational boundaries

Name	Consolidation percentage
Strukton Groep N.V. <i>Group</i>	100%
Portfolio Investment Holding B.V. <i>Department</i>	100%
Strukton Roads & Concrete <i>Department</i>	100%
Strukton Infrastructure Specialties B.V. <i>Department</i>	100%
Strukton Power B.V. <i>Department</i>	100%
Strukton Rail B.V. <i>Department</i>	100%
Strukton Rail Italy <i>Department</i>	100%
Strukton Rail Nordics <i>Department</i>	100%

3.2 Organisational changes

As of December 15th 2023, Strukton Immersion Projects has been sold to Immontec Holding. As Strukton Immersion Projects was outside of scope in the base year 2021, the base year has not been adjusted. To improve year-on-year comparability, Strukton Immersion Projects has been excluded from the emission figures in previous years.

As of December 31st 2023, Strukton Grid Solutions (previously part of Strukton Power) has been sold to Spie. This concerned a sale of activities and not of a legal entity. Therefore, the base year has not been adjusted. Similarly, the GHG emissions of Strukton Group in 2023 have not been adjusted as a result of the sale of Strukton Grid solutions. Strukton does not have the necessary granularity in order to make this adjustment.

As of March 28th 2024, A1 Electronics (previously part of Strukton Power) has been sold to Gimv. As A1 Electronics was part of Strukton for almost the whole of Q1, A1 Electronics is still incorporated in the Q1 carbon footprint. Because A1 Electronics is still part of the Q1 GHG emissions, the GHG emissions of Strukton Group in the base year as well as previous years have not been adjusted as a result of the sale of A1 Electronics.

As of April 2nd Strukton Integrated Projects has been sold to Aiber Services. Because Strukton Integrated Projects is still part of the Q1 GHG emissions, the GHG emissions of Strukton Group in the base year as well as previous years have not been adjusted as a result of the sale of Strukton Integrated Projects.

3.3 Projects tendered with CO2 Performance Ladder component

Once a year, a list of won projects that included a CO2 Performance Ladder component is published on the [SKAO website](#).

4 Calculation method

4.1 Current calculation method and conversion factors

The conversion factors to calculate the CO₂-footprint were derived from several sources, in line with the local standards:

- For the Netherlands: <https://www.co2emissiefactoren.nl>
- For Belgium: <https://www.co2emissiefactoren.be>
- For Italy: Association of Issuing Bodies (AIB)
- For the Nordics: Swedish Energy Authority

4.2 Changes in calculation method

The calculation method has not been changed during the reporting period.

4.3 Exclusions

Similarly to previous years, the electricity used for the trains deployed by Strukton Rail Equipment is excluded from the footprint.

4.4 Absorption of CO₂

Strukton develops commercial concrete products made with miscanthus grass. This grass absorbs 4 to 5 times as much CO₂ during growth as a forest of similar dimensions. After processing, the CO₂ remains captured within the grass.

Next to that, we are piloting a new type of railway element – a railway sleeper made out of bamboo composite - at an industrial track. Over its life cycle this bamboo composite sleeper has a significantly lower carbon footprint compared to commonly used alternatives. This is due to the absorption of carbon during the growth of bamboo that remains captured within the product after production.

4.5 Biomass

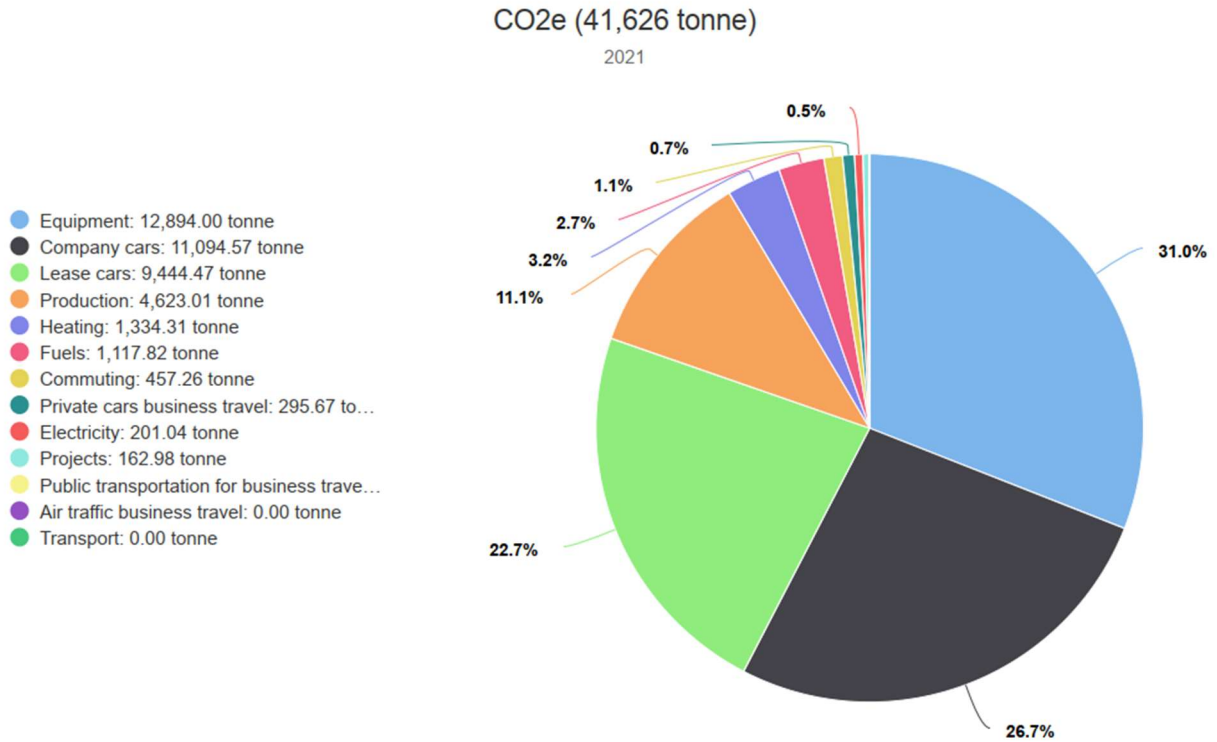
Strukton does not use biomass.

4.6 Uncertainties

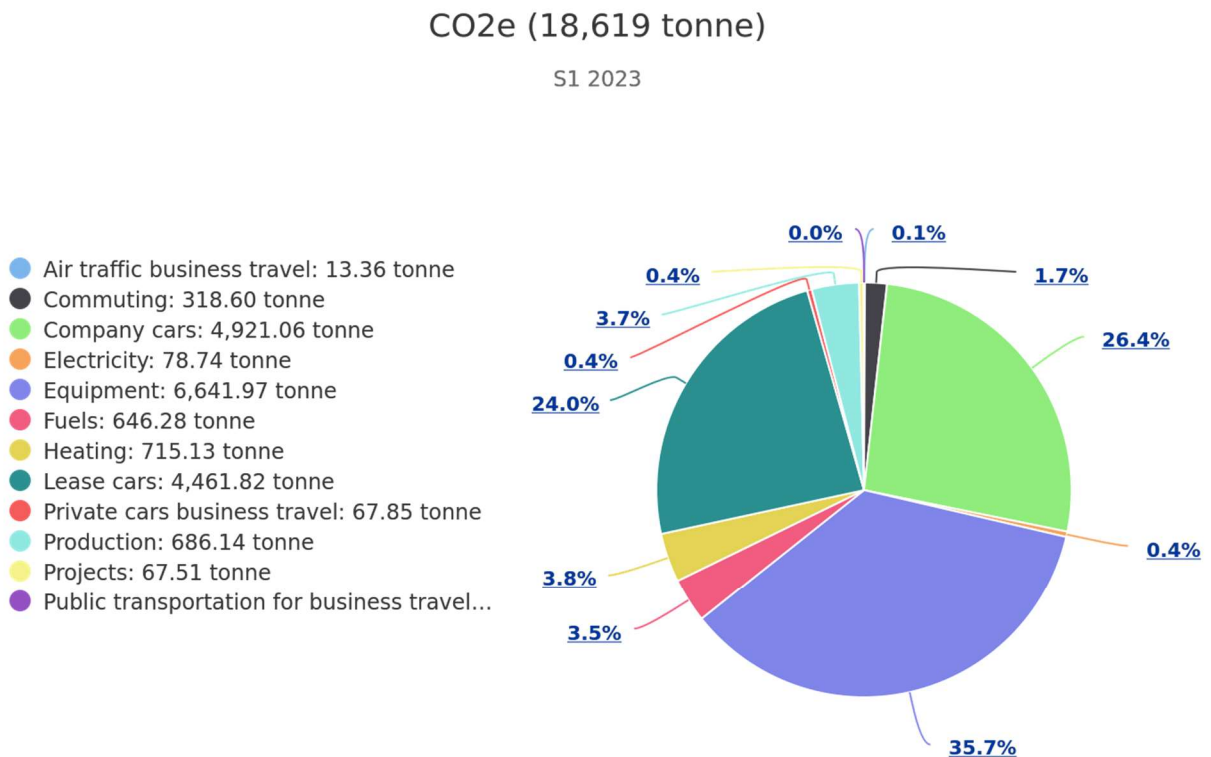
Because the data on fuel consumption (both fossil fuels and electricity) used by our fleet is not available on time, we extrapolate the data on fuel consumption during the first 2 months of the quarter to estimate consumptions for the 3rd month. Differences between the extrapolation in the previous quarter and the actual emissions are corrected when the missing data becomes available.

5 CO2 emissions

5.1 Footprint base year and prior year scope 1 & 2



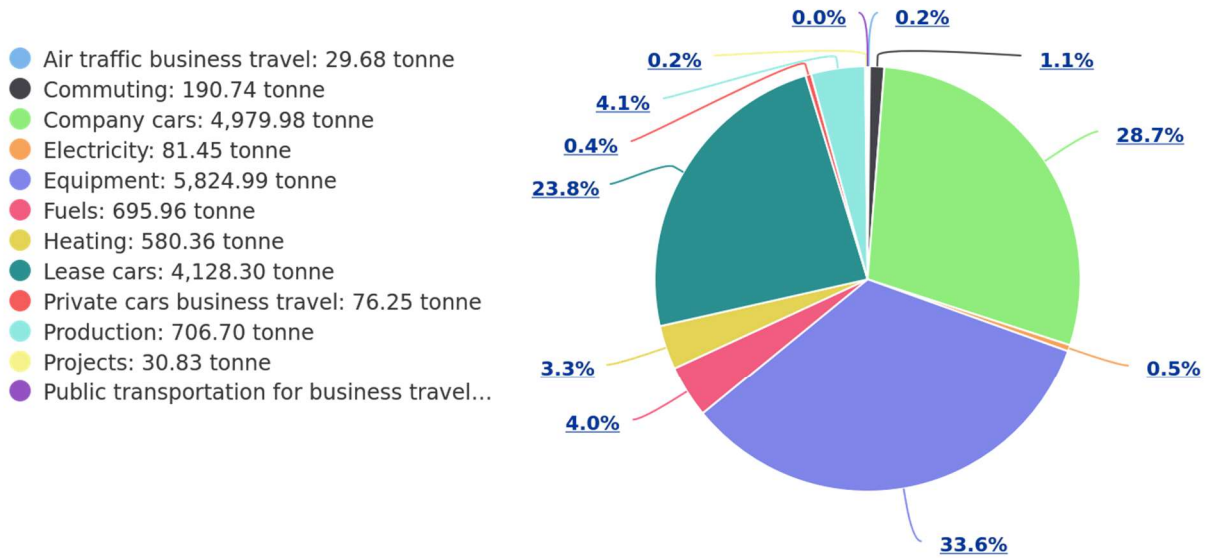
5.2 Footprint scope 1 and 2 Q2 2023



5.3 Footprint scope 1 and 2 reporting period (Q2 2024)

CO2e (17,326 tonne)

01/01/2024 until 06/30/2030



5.4 Trend over the years by category

CO2 emissions 01/01/2021 until 12/31/2030

CO2 emissions 2021-2024

CO2 (ton)	2021	2022	2023	Q2 2024
Air traffic business travel	0.00	81.63	58.11	29.68
Commuting	457.26	615.50	659.11	190.74
Company cars	11,094.57	10,376.57	10,094.82	4,979.98
Electricity	201.04	169.35	161.03	81.45
Equipment	12,894.00	11,441.81	13,040.54	5,824.99
Fuels	1,117.82	1,381.81	1,402.98	695.96
Heating	1,334.31	1,673.14	1,425.49	580.36
Lease cars	9,444.47	9,101.42	9,037.05	4,128.30
Private cars business travel	295.67	161.69	149.64	76.25
Production	4,623.01	2,624.04	1,511.47	706.70
Projects	162.98	87.85	121.24	30.83
Public transportation for business travel	0.44	1.12	1.43	1.24
Total	41,625.56	37,715.93	37,662.90	17,326.48

Quarterly figures (Q1+Q2) 2021-2024

CO2e (ton)	Q2 2021	Q2 2022	Q2 2023	Q2 2024
Air traffic business travel	0.00	1.62	13.36	29.68
Commuting	226.75	200.60	318.60	190.74
Company cars	5,511.96	5,142.37	4,921.06	4,979.98
Electricity	100.52	85.86	78.74	81.45
Equipment	6,423.36	6,219.88	6,641.97	5,824.99
Fuels	558.91	642.83	646.28	695.96
Heating	661.14	951.45	715.13	580.36
Lease cars	4,697.17	4,289.73	4,461.82	4,128.30
Private cars business travel	146.62	71.32	67.85	76.25
Production	2,292.51	1,091.29	686.14	706.70
Projects	80.82	12.61	67.51	30.83
Public transportation for business travel	0.22	0.55	0.79	1.24
Totaal	20,699.97	18,709.10	18,619.26	17,326.48

The most significant developments in the trend over the years are highlighted below.

- **Air traffic business travel** – The emissions from flights have increased significantly compared to the first half of 2023. Strukton will follow this development closely to determine whether this is a trend and our international travel policy requires a stricter follow-up.
- **Commuting** - In the first half of 2024, employees worked relatively more often at home than in the first half of 2023. Additionally, the centralising of office locations in Utrecht further limits commuting, causing a decrease in emissions.
- **Company cars** - The emission of company cars gradually decreased in recent years. This is the result of less driven kilometres. In the first half year of 2024, emissions from company cars increased slightly compared to the first half of 2023.
- **Electricity** - Our energy use decreased in recent years owing to measures taken, in particular centralising office locations in Utrecht. Compared to the first half of 2023, CO2 emissions increased slightly in the first six months of 2024.
- **Equipment** - The emissions from Strukton's equipment show a significant decrease compared to 2023, especially in Q2 2024. This can be a result of the electrification of equipment at project sites as well as less carbon intense projects. Strukton will monitor this trend closely to see whether this is an incidental decrease or a decreasing trend that will continue.
- **Heating** - The emissions caused by heating decreased due to a milder winter in 2024 when compared to 2023, particularly in the Netherlands. This caused a decrease in gas consumption and consequently a decrease in heating related emissions.
- **Lease cars** - The emission of lease cars decreased compared to 2023 because of the introduction of more electric cars. The expectation is that the 2024 emissions will slightly rise over the remainder of 2024, after which they will drop by 10% per year until 2030 as a result of the new electric-only lease policy.
- **Production** – Compared to the CO2 emissions from production in the first half of 2023, the CO2 emissions have increased slightly. However, the average emissions in the first six months of 2024 are slightly lower than those in the first half year of 2023. Strukton will monitor closely whether this trend will continue in the quarters to come.

- **Fuels** – Emissions from fuels have slightly increased compared to 2023. This is mainly caused by a higher fuel consumption in Denmark, which is in line with the growing operations and revenue.

5.5 Goals

Strukton's sustainability ambitions for the period 2021-2035 are:

- We want to be a climate-neutral organisation by 2035
- Our working locations (both office and project locations) are free of harmful emissions and residual waste by 2030
- We design our products and projects in a circular way, re-use materials and build with circular materials by 2030
- All our projects contribute to better soil quality and biodiversity by 2030

Our ambition to be climate-neutral by 2035 breaks down in the following goals to reduce carbon emissions:

- We reduce our total gross carbon emissions in 2030 by 50% compared to 2021, related to our operating income
- We reduce our carbon emissions resulting from business travel by 50% per FTE in 2030 compared to 2016
- We reduce carbon emissions in our value chain for the production and commissioning of (circular) concrete catenary supports by 55% in 2030 compared to 2023
- We reduce carbon emissions in our value chain for the production of ballast and ballasting tracks by 50% in 2030 compared to 2023

We have translated these long term goals into annual goals for the period 2024-2026. The annual goals for 2024 to 2026 (expressed as a percentage) are relative reductions compared to the gross emissions of the previous year. When we achieve a goal before the date provided, we will update our goals accordingly.

CO2 emission targets

Year	Reference year	Car fleet per FTE	Equipment per operating income	Natural gas per gross surface area
2024	2023	5%	10%	5%
2025	2024	5%	10%	5%
2026	2025	5%	5%	5%

5.6 Progress of reduction measures

The implementation of and progress on measures to achieve the aspired reductions is described for each goal separately.

Our overall gross carbon emissions added up to 17,326 tons over the first half of 2024. Compared to the first half of 2023 (18,679 tons) we achieved a decrease of 1,212 tons (- 6.5%). Relative to our operational income we achieved a reduction of 6.31 tons CO₂ (or 21.2 %) per million euro: 28.83 tons CO₂ per million euro over the first half of 2023 as compared to 23.77 tons CO₂ per million euro in the first half of 2024. This can be attributed to both a significant increase in revenue and the aforementioned decrease in total emissions compared to 2023.

GHG emissions in tons	2023	2024	Difference	% difference
Gross carbon emissions	18,679	17,326	-1,353	-7.2%
GHG emissions per mln euro	28.83	23.77	-5.06	-17.6%
GHG emissions per FTE due to business travel	2.42	2.35	-0.07	-3.0%

Tons GHG emissions per FTE due to business travel decreased to 2.35 tons GHG emissions per FTE (2023: 2.42 tons).

General measures

Strukton Italy is implementing a new management system which will help Strukton Italy identify further reduction opportunities.

Strukton Rail Nederland is in dialogue with ProRail about tightening sustainability requirements in tenders related to a zero emission working site. This would stimulate more investments in zero emission machinery as it would level the playing field.

Mobility

As of Q1 of 2024, a new lease policy applies in the Netherlands. This policy requires employees to lease full-electric vehicles only. This will mainly have an impact on a longer term as combustion engine cars will slowly be replaced. Non-electric vehicles will only be allowed if the electric equivalent is not possible due to the nature of the work or the circumstances. This policy applies to all Dutch entities.

In the Netherlands, Strukton facilitates electrical charging stations and (e-)bikes at project sites where possible to reduce mobility related emissions. Additionally, staff with a lease car have access to a public transport card. For office staff, remote meetings are encouraged to reduce the amount of car commutes, while electrical bikes are made available for the commute between the office and train station. In order to identify new ways to stimulate sustainable mobility, Strukton has ongoing conversations with NGOs related to a further improvement of the mobility situation around the headquarters, with a focus on the stimulation of public transport and bike commutes.

For the lease of new vans, electric is the standard within Strukton Rail Netherlands as of January 1st 2024. Like with the business cars, the impact will only be visible on a longer term. An additional pilot will be started with electric company vehicles (E-LCVs). These E-LCVs will be delivered at the beginning of Q3 2024.

In Belgium, Strukton organised another bike-and-breakfast event, in which colleagues who commuted to work by bike that day were welcomed with a breakfast.

At Strukton Rail Nordics, the possibility to lease (non-)electrical bikes was implemented, while initiatives to increase the amount of electrical cars and the share of biofuel are being worked on. This includes the use of self-developed mobile charging stations for electrical vehicles.

Equipment

In the Netherlands, Strukton Rail has performed its first two pilots with an electric crane on rails. These pilots included charging facilities at the work site and a fast charging electric crane on rails. The reactions

on the pilots were positive. Following the results of the pilots, Strukton Rail has ordered the retrofitting of 3 additional diesel cranes on rails to a completely electric crane on rails.

Strukton Rail Netherlands has worked together with students of TU Eindhoven in a research focussed on electrifying small mechanical equipment. This research was completed in Q1 of 2024. The results will be used by Strukton in further electrifying the machinery.

The procedures for the admittance and certification of Strukton Rail's retrofitted aerial working platforms for catenary work and Strukton Rail's battery-powered locomotive are still pending.

Strukton Roads & Concrete has completed the N270 Deurne project, using emission-free and low-emission equipment, applying recycled asphalt and using HVO. At this project, Strukton Roads & Concrete conducted a pilot using Strukton Rail's electric crane on rails operating as a regular electric crane, with a battery pack system that has been developed by Strukton Power. The use of emission-free and low-emission equipment was initiated to reduce NOx, and will also lead to CO2 reduction. The lessons learned from this project are being applied in other tenders and projects.

Where possible, Strukton Infrastructure Specialties (SIS) uses HVO100 as a replacement for regular diesel. This results in a significant reduction of overall emissions from Strukton's machinery. On the Dijkgracht project in Amsterdam, SIS has been increasingly using low-emission equipment in the form of an electrical telecrane, which is one of the first in Europe. The intention is to use more low-emission and zero-emission equipment during 2024. This can also be seen on the Zoutkamp project, where an electrical tower crane and telehandler are used.

Energy

For 2024, Strukton Italy has planned to invest in the construction of photovoltaic systems at two of their offices. The construction of these PV systems is expected to be completed by the end of 2024. This is expected to reduce CO2 emissions from energy consumption at Strukton Italy significantly.

In the Netherlands, Strukton is minimising their fossil fuel energy usage by using batteries and hybrid generators at their project sites. Furthermore, Strukton started with a project to standardise the facilities for construction sites in the Netherlands, which includes (green) energy supply.

Furthermore, next to installing solar panels at project sites, SIS is actively trying to place solar panels on buildings around the project sites on a temporary basis. This will enable SIS to further reduce the use of fossil fuels as an energy source.

In the Nordics, Strukton only purchases renewable energy to further promote the energy transition and limit emissions associated with non-renewable energy sources, while gas is only used as an energy source for welding processes.

Projects

For each project gained with CO₂-related award advantage, we draw up a reduction plan, which is discussed with the customer. The initiatives taken to reduce emissions of fuels on equipment and for the power supply have the biggest impact on the scope 1 and 2 reduction at the project and contract sites (in addition to lease cars). We try to optimise the use of electricity instead of fuel. The knowledge and best practices are used throughout Strukton.

In the Netherlands, Strukton Rail has made new agreements with the supplier of construction sheds, using only well isolated sheds in combination with a hybrid power unit. The initial results on fuel savings are very promising for the remainder of 2024.

Scope 3

In addition to reducing scope 1 and 2 emissions, we are taking measures to reduce scope 3 emissions.

- We are carrying out pilots with catenary constructions made of circular concrete. The entire process (from the demolition of old catenary structures to the deconstruction and construction of new ones) is carried out by various Strukton companies.
- By carrying out (preventative) maintenance on time, our ambition is to prevent large-scale maintenance or renewal, which means that fewer materials are needed.
- On an industrial track, we are carrying out a pilot with a new type of bamboo composite sleeper. This type of sleeper significantly reduces CO2 emissions over the entire life cycle compared to the traditional concrete sleeper; the bamboo sleeper even has negative CO2 emissions.
- If the client allows it, we reuse elements (switches, sleepers, gantries, transitions) and materials in our projects (such as circular concrete for platforms). We proactively approach clients to discuss options for reusing elements.
- Strukton is part of the sector-wide initiative Groene Liggers V.O.F., which is focused on increasing the reuse rate for girders. Where prior pilots have shown that circular girders are technically possible, Groene Liggers' goal is to upscale this towards a mature market. Currently this project is focussed on learning from applying different organizational forms of reuse. By applying these different organizational forms Strukton aims to discover effective ways to normalising the reuse of girders and achieve upscaling as well as sharing knowledge on circularity with the infrastructure sector. Currently Strukton is organizing a pilot at two projects in which harvested contact beams will be used.

Apart from the measures described above Strukton also takes action to influence the value chain:

For reducing the scope 3 emissions, Strukton is actively involved in conversations with value chain partners (for instance the 'sustainable railways chain dialogue' (*ketenoverleg duurzaam spoor*) in the Netherlands that was initiated by GBN). Based on this dialogue, an advisory report was generated regarding the process to release new materials. This report was presented to Strukton's biggest client with the aim to accelerate the acceptance and implementation of sustainable alternatives. Strukton is also organising sessions with value chain partners to discuss challenges in the value chain surrounding sustainability.

Strukton was an active participant in the Dutch Week of Circularity in March 2024. This week focuses on the transition to a circular economy. Strukton shared its efforts to sustainalize the concrete chain, such as the production and application of circular concrete catenary pillars and by reusing concrete bridge girders. As concrete is one of the most carbon intensive resources that Strukton uses, the use of circular concrete could significantly reduce the scope 3 emissions. Furthermore, Strukton is actively involved in efforts to close the loop and create circular resource flows. Also, GBN shared its experience with organising a circular resources corridor. Strukton Rail Short Line described how reusing materials works for industrial train tracks.

Strukton participated in the CEE Staal Tafel. This event focused on the road towards circular steel and the production of steel with (near to) zero carbon emissions. Steel is one of the most carbon intensive resources that Strukton uses. Therefore, developments in circular steel or blue or green steel would significantly reduce our scope 3 emissions.

Strukton Rail and supplier Voestalpine Track Solutions Netherlands organized a meeting about reusing switches for a delegation of ProRail. The goal was to share experiences, challenges and opportunities in order to promote reusing materials within the railway sector.

Strukton Rail organized a meeting for a delegation of ProRail about circular concrete (for more information, see the value chain analysis below). The meeting was held at Strukton Rail Equipment in Zutphen, where a catenary pillar made from circular concrete was installed.

GBN facilitated a workshop about reusing bridge girders during the event 'Together on the way towards a Climate Neutral and Circular Infra', organized by ProRail and Rijkswaterstaat.

Strukton's CSR code of conduct for suppliers has been updated to be more in line with Strukton's sustainability efforts and the upcoming CSRD and CSDDD responsibilities.

For the time being, Strukton calculates scope 3 emissions on the basis of SPEND. In 2023, our scope 3 emissions amounted to 299,027 tonnes, with sales of 1.4479 billion euros. In 2022, this was 293,559 tonnes, with a turnover of 1.4233 billion euros. This is an absolute increase of 1.86 percent in scope 3 emissions, while the GHG emissions per million euros revenue have increased by 0.13%.

Strukton wants to increase its insight into scope 3 emissions. We are currently investigating the possibilities of calculating these emissions based on quantities of material.

Other

Together with the Vlinderstichting and companies in the construction sector in the Netherlands, Strukton was actively involved in developing the Natuurladder. The Natuurladder was published in May 2024 and is available for project teams. Strukton is now taking the next step to apply the Natuurladder in projects and tenders.

Value chain analysis

Strukton has carried out a materiality analysis to determine which activities lead to the highest emissions in scope 3 and which supply chains have the greatest impact. The activities with the greatest impact are our rail activities in the Netherlands. The use of materials, especially steel and concrete, has the biggest impact on our scope 3 emissions. Based on the analysis and an analysis of our own influence in the value chain, our strategic focus is on concrete and track ballast. These are two chains with a major impact on CO2 emissions, and they are also the supply chains where Strukton has some influence to reduce CO2 emissions. Our goal is to reuse as many materials as possible, and then refurbish and recycle them (if our clients allow this). We have analysed the supply chains of these materials and formulated CO2 reduction targets and measures. The detailed chain analyses, including the objectives and progress thereon, can be found on [our public website](#).

Circular concrete catenary gantries

Strukton Rail is working with GBN and Prefab Beton on catenary gantries made of circular concrete. Old concrete portals are removed from the track by Strukton Rail and processed into granulate by GBN. Prefab turns these into new concrete elements and Strukton Rail places them back on the track. The chain for circular concrete catenary portals is as follows:

Phase A1	Extraction of (reused) raw materials
Phase A2	Transport of the raw materials to the production site in Utrecht
Phase A3	Producing the elements
Phase A4	Transport of the elements to the project site
Phase A5	Construction/installation of the elements
Phase C1	Dismantling the elements
Phase C2	Transport of the old elements to the location where the raw materials are recovered
Phase C3	Resource recovery

The goal for 2023 was a CO2 reduction of 9.7%. However, only 0.014% CO2 has been reduced. There are a number of reasons for this:

- Unfortunately, gantries made of circular concrete are not yet included in ProRail's SPC (product specifications). This means that the product may not yet be used in the track. Circular concrete was therefore not used in the projects in 2023, and this is also not allowed in the first tenders won in 2024. In 2023, only six circular concrete portals were installed as a trial.
- The switch to HVO100 in phases A5 and C1 has not been made, because this will void the warranty on the equipment.

However, Strukton sees sufficient starting points to continue this chain initiative and collaboration. Circular concrete is an innovative product, in which quality, safety and lifespan are of great importance. Strukton therefore focuses on making this demonstrable for our client. If this succeeds and the product is allowed to be used once, the reduction in the chain can be very large. In addition, Strukton is investigating the possibilities of producing other concrete elements around the track using circular concrete. For example, foundation blocks, but also retaining walls and concrete plugs. Strukton's own calculations show that CO2 can also be reduced in this way. That is why Strukton will expand this chain analysis with these circular concrete elements in 2024. Strukton is also constantly working on making its equipment more sustainable.

Track ballast

Track ballast (also known as crushed stone) is used to keep the track stable, dampen vibrations, and drain excess rainwater. The material is extracted in foreign quarries, because it is not naturally present in the Netherlands. The entire chain is as follows:

Phase A1	Extraction of raw materials
Phase A2	Transport of raw materials to the Netherlands
Phase A3	Breaking the stones to the right fraction
Phase A4	Transport of the ballast to the project site
Phase A5	Installation of the ballast at the project site
Phase C1	Removal of old ballast from the project site
Phase C2	Disposal of old ballast to processors
Phase C3	Processing old ballast into raw material or into new products

The goal for 2023 was a 1.96% CO2 reduction. The reduction achieved is no less than 11%. This is because much more transport took place by rail to transport the ballast in and out than previously estimated.

For 2024, this means that Strukton will tighten up the targets for phases A4 and C2.

One challenge is that the rail sector is confronted with a ruling by the Labour Inspectorate regarding the use of quartz-containing ballast. To this end, ProRail has drawn up a Quartz Action Framework, which Strukton adheres to. This means that Strukton has to use quartz-free ballast in more and more places and

is therefore less likely to be able to opt for recycled ballast or ballast from quarries with lower CO2 emissions. This does not have any direct consequences for this chain analysis, because no reduction target had yet been defined for phase A2. However, this does increase the CO2 emissions of the entire chain.

In the coming period, Strukton will focus on further reducing emissions in phases A4 and C2. Strukton will then determine whether sufficient progress can be made in this chain analysis, or whether the company should focus on another chain to further reduce scope 3 emissions.

5.7 Employee engagement

Several initiatives are deployed across the organisation to increase employee awareness regarding (the importance of) sustainability. For example, sustainability is a topic during the onboarding of new employees and during quarterly meetings. In the 'Winterschool' of Strukton Rail Nederland, sustainability was one of the subjects; all employees working at contract and projects sites attended the Winterschool. Sustainability is also part of an internal course on rail infrastructure techniques within Strukton Rail Nederland (BORIT). During Q1 2024 the CSR team of SIS organised workshops about sustainability and Strukton Roads & Concrete organised an online lunch meeting about sustainability. 15 colleagues participated in the Climate Classic, a cycle tour along the 'imaginary' coastline that will arise as a consequence of climate change and rising sea levels. The tour is about raising awareness and unleashing action. Strukton Rail Netherlands organized a brainstorm about reducing waste.

In Belgium, Strukton formulates collective targets for all employees. When these targets are met, every employee will be rewarded. The 2023 collective targets focused on 4 different themes having to do with sustainability (from taking the train, organising bike days to checking the tyre pressure of vans to collecting waste). The 2023 collective targets were such a success that the same themes are repeated in the collective targets for 2024. Strukton Rail Belgium organized a workshop on sustainability for all staff. Part of this workshop was creating the construction site of the future.

6 Initiatives

Strukton actively participates in initiatives and actions including:

- Battery powered yard locomotive on industrial rail tracks
- Europe's Rail Joint Undertaking
- Closing the Loop initiative for circular viaducts
- Coalitie Anders Reizen
- Manifest Duurzaam GWW 2030
- Green Deal Verduurzaming Betonketen (Betonakkoord - national concrete deal)
- De Duurzame leverancier
- Asphalt Impuls
- Bewuste Bouwers
- Emissieloos Netwerk Infra (ENI)
- De Groene Koers
- Bereikbaarheidsalliantie A2
- Programme Natural Capital in Construction Sector
- Transition paths of ProRail and Rijkswaterstaat
- Nature builders (part of Infranatuur – Delta plan recovery of biodiversity)
- Ketenoverleg duurzaam spoor
- Circulaire Grondstoffencorridor Utrecht
- Energie in het OV
- Energy hub in Rotterdam

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APPENDIX: Glossary and abbreviations

- CI – Certifying body
- CO₂ – Carbon dioxide
- E-LCV – Electric light commercial vehicles
- EV – Electric vehicle
- FTE – Full-time equivalent
- HVO - 'Hydrotreated vegetable oil'. This type of diesel is, next to the vegetable oils, produced from waste, residue oils and fats, such as used cooking oil.
- PV panel – A device that converts sunlight into electricity by using photovoltaic (PV) cells. PV cells are made of materials that produce excited electrons when exposed to light
- SKAO – Stichting Klimaatvriendelijk Aanbesteden en Ondernemen
- Sleeper – A large heavy beam that support the rails of a railway track



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