

CO₂ progress report
2023-S1
Organizational Boundary

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1. Introduction

In line with the purpose of BESIX Group **"Excel in creating sustainable solutions for a better world"**, BESIX aims to actively contribute to the transition to a low-carbon society.

As part of BESIX Group, BESIX supports the Sustainable Development Goals (SDG's), with a particular focus on SDG 13 on climate change. As an active member of the United Nations Global Compact, our group indeed recognizes the urgency of the climate challenge and addresses it as one of the main challenges of the construction sector.

In line with the Sustainability Forward program of BESIX Group, BESIX extended in 2022 the boundary of her actual CO2 performance ladder certification (for her activities in the Netherlands) to the European Business Unit.

This periodic progress reporting is part of the steering cycle within the energy management system that has been introduced in the context of the CO2 performance ladder. This control cycle is described in the quality management plan. This progress report has been drawn up by the Steering Cycle Responsible of BESIX and describes all matters as described in § 9.3.1 of the ISO 14064.

This progress report covers the CO2 performance ladder Organizational Boundary and has to be seen as a consolidated progress report. Each company belonging to the CO2 performance ladder Organizational Boundary also reports its progress on an individual basis.

The following aspects of the ISO 14064-1 are described in this report: Introduction (p), Description of the organization (a), Responsibilities (b), Base year (j), Reporting period (c), Verification (q), Organizational boundaries (d), Current calculation method and conversion factors (l, n), Changes calculation method (m), Exclusions (h), Absorption of CO2 (g), Biomass (f), Recalculation of base year and historical data (j, k), Direct and indirect emissions (e, i) and Uncertainties (o).

2. Energy & Carbon Policy

BESIX and the other companies belonging to the Organizational Boundary recognizes the urgency of the climate challenge and addresses it as one of the main challenges of the construction sector.

Our ambitions in this area are threefold:

- to become neutral for our own direct (scope 1) and indirect (scope 2) carbon emissions by no later than 2050;
- to promote and to be a leader in providing sustainable solutions to our partners and clients and, in doing so, to help them achieve their own climate goals and targets;
- to promote and incentivize our supply chain, in particular the building material producers with the greatest potential in this area, to reduce their carbon emissions (our scope 3 emissions) in order to become neutral by no later than 2050.

The above ambitions have been defined because our impact as a construction company is twofold. It is direct through our own construction operations and project execution. It is indirect through the value chain of our partners and suppliers, and through the sustainable solutions we promote and deliver to our client.

We will therefore for all relevant direct and indirect emissions (scope 1, 2 & 3):

- monitor and analyze our energy consumption;
- calculate our carbon footprint;
- set reduction objectives and strive to achieve them;
- implement an energy and carbon reduction programme to meet our objectives and which will be reviewed periodically;
- periodically monitor and analyze our energy consumption and carbon emissions;
- report and communicate structurally on our carbon footprint and progress on our reduction objectives

In order to meet our objectives and continually reduce our energy consumption and carbon emissions, we will:

- demonstrate leadership on a daily basis;
- wherever possible, guide and advise our clients in choosing the most sustainable solution for their projects;
- actively promote and implement energy and natural resource saving measures;
- minimize waste, promote recycling and the use of recycled product to help reduce the amount of waste sent to landfill;
- adopt a sustainable procurement policy;
- actively engage in climate action related dialogues with suppliers and subcontractors, employees and peers;
- research sustainable solutions for our industry and clients, in line with our reduction objectives;
- inspire other companies in our sector and share our best practice and knowledge;
- engage subcontractors to work in full compliance with this policy

3. Reduction targets

3.1. Scope 1, 2 & 3 (commuting and business travel)

The overall ambition for the Organizational Boundary is to reduce the scope 1 & 2 + commuting and business travel related emissions per million euro turnover with 40% by end 2030 related to the baseline year (2019). Intermediate targets have been defined and are made visual in the progress chart in chapter 8.2.

In order to achieve the overall ambition and based on an analysis of the consolidated carbon footprint of the baseline year 2019, intensity reduction targets (emission per million euro turnover) have been defined for the most relevant emissions categories.

These reduction targets have been set for end 2030 and relates to the baseline year 2019.

- minimal 60% reduction for the emissions related to company lease cars;
- minimal 57% reduction for the emissions related to utility vehicles;
- minimal 15% reduction for the emissions related to on-road equipment and internal transport;
- minimal 27% reduction for the emissions related to owned heavy site equipment.

Above the intensity reduction target, an absolute reduction target has been set for electricity. By no later than end 2025 all electricity used for offices, production facilities and projects for which we have a direct control on the type of energy contract will originate for 100% from renewable sources.

Each company of the Organizational Boundary has defined its own reduction targets in order to achieve the overall ambition.

3.2. Scope 3

Based on a qualitative and quantitative scope 3 analysis performed in 2022, focus is given to the most relevant upstream scope 3 category, Purchased goods and services, for defining scope 3 reduction targets.

Within this scope 3 category, the most relevant product categories are ready-mix concrete and steel (rebar, (structural) steel, (sheet)piles).

- for ready-mix concrete: by signing both the Dutch 'Betonakkoord' and the Flemisch 'Circulair Betonakkoord Vlaanderen' BESIX committed itself to the reduction targets as defined in both agreements.
- for steel: BESIX is following the reduction ambitions of the steel sector and more specific the 'Bouwakkoord Staal'.

The **downstream scope 3 emission** category 'use of sold products' and 'end of life treatment of sold products' are not yet embedded in the scope 3 footprint calculation due to the complexity and limited availability of data. The objective is to include these emission categories step by step in the coming years in the company's scope 3 carbon footprint with a primary focus on design & build projects where our impact can be maximized. Nevertheless actions are already taken to reduce the emissions of both categories as much as possible. Please refer to chapter 10 for more details on our scope 3 roadmap.

4. Basic information

4.1. Description of the Organizational Boundary

4.1.1. BESIX Business Unit Europe

BESIX is a part of BESIX Group, a leading Belgian Group, and based in Brussels and operating in 25 countries on 5 continents in the construction sector, real estate development and concessions sectors. Active since 1909, BESIX operates both in the building as civil and infrastructure sector.

The European Business Unit is active in France, Benelux and Italy and mainly active in the building and civil / infrastructure sector.

BESIX's engineering department enables BESIX to carry out complex and unique projects, particularly in terms of technical and environmental aspects. BESIX has developed cutting-edge expertise in the energy performance of infrastructures. In 2020, for example, by combining sustainable solutions for electricity, ventilation and lighting, BESIX is building the first 100% CO2 neutral tunnel in the Benelux, in Rotterdam.

BESIX and its subsidiaries have often been pioneers in the field of energy performance of buildings. In Paris, Brussels and Rotterdam, BESIX has contributed to the design and construction of buildings that meet the highest environmental certifications (BREEAM, LEED, Passive Building, Cradle-to-Cradle, etc.) and contribute to improving standards in the sector.

The BESIX Group subsidiaries which are part of the CO2 performance ladder Organizational Boundary focuses on road works, deep foundation techniques and on construction, installation & maintenance of networks, technical infrastructure and electrical installations.

4.1.2. BESIX Nederland BV

BESIX Nederland BV is an internal service provider for BESIX and provides human resources, management and support services (QHSE, administration, accounting,...) for the Dutch branch of BESIX.

4.1.3. BESIX Environment

BESIX Environment is active in (waste)water treatment, waste processing and sustainable energy solutions such as biogas, biofuels, green hydrogen, heat recovery and renewable hydropower. The full scope of services includes the design, engineering, execution, start-up, operation and maintenance of environmental projects.

4.1.4. BESIX Infra

BESIX Infra is the knowledge-driven road building contractor for the Flemish and Brussels markets, and is one of the top three players in the Belgian infrastructure market for both public and private clients.

BESIX Infra is active in:

- road construction and related works, including earthworks, sewerage, paving and railway works;
- works of civil engineering;
- installation of non-electric road signs;
- carrying out jacking operations;
- realization of sports fields;
- remediation projects;
- processing and crushing of rubble and construction waste.

4.1.5. BESIX Infra Support

BESIX Infra Support is a service provider and provides human resources and support services (QHSE, administration, accounting,...) for both BESIX Infra and BESIX Unitec (Automation).

4.1.6. Franki Foundations (group)

Franki Foundations Belgium and its subsidiaries Franki Grondtechnieken BV and Atlas Fondations SAS are specialized deep foundation contractors, delivering complex projects that meet the highest standards of design, quality and safety.

With more than a century of experience and know-how, Franki Foundations is known worldwide as an expert in deep foundation techniques.

4.1.7. BESIX Unitec (group)

BESIX Unitec has an extensive experience in cable and pipeline construction and offers its customers high-quality infrastructure solutions for underground and above-ground cables and pipelines, horizontal directional drilling, high voltage and traction, (fiber optic) networks and structured cabling systems, heat networks, signaling and monitoring systems, house connections, tunnel installations and traffic techniques. BESIX Unitec (group) consists of BESIX Unitec and its subsidiaries BESIX Connect, Appermont Gebroeders, BESIX Unitec Nederland and BESIX Unitec Automation.

The scope of the activities of BESIX Unitec and its subsidiaries are situated in:

- the construction and maintenance of networks for utilities and telecom operators.
- the construction and maintenance of technical infrastructure along motorways, railways and waterways.
- the construction, installation and maintenance of electrical installations
- automation, electromechanical solutions for the civil sector and civil engineering maintenance.

BESIX Connect NV was created in 2021 following the merger of Larabo and Uniconnect, both subsidiaries of BESIX Unitec since respectively 2017 and 2018, and specialized in:

- the installation of underground cables and utility pipes including connections
- the construction of fiber optic networks including connections
- performing directional & horizontal drilling.

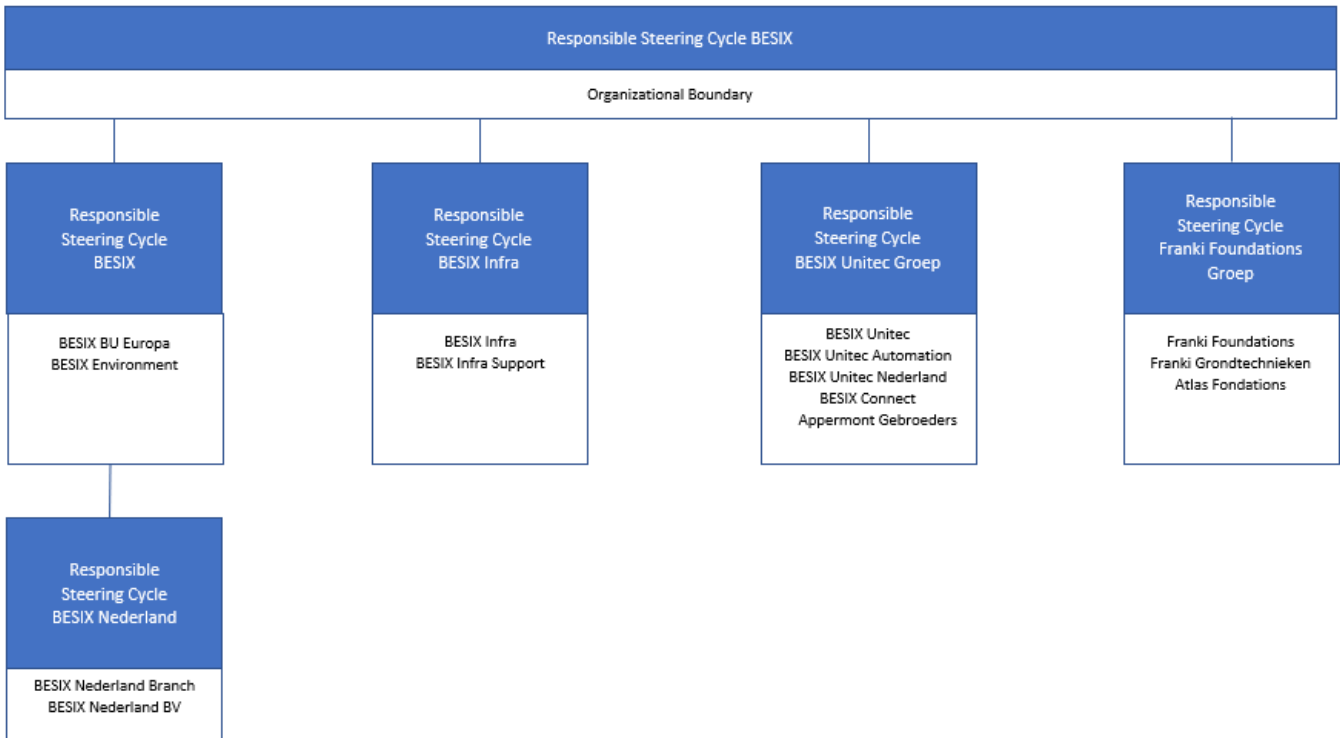
Appermont Gebroeders bv, a subsidiary of BESIX Unitec since 2020, is a builder of network infrastructures and is specialized in the installation of cables and pipelines along the railway network.

BESIX Unitec acquired in September 2021 both Agidens Infra Automation NV and BV. In March 2022 both companies changed names into BESIX Unitec Nederland BV and BESIX Unitec Automation NV. Both companies started their activities in the infrastructure market in 1987 as part of what was then Egemin and grew into a strong, reliable and experienced player on the market for large infrastructure projects in both Belgium and the Netherlands. Over the years, BESIX Unitec Automation NV has become a market leader in automation, electromechanical solutions for the civil sector and civil engineering maintenance.

4.2. Responsible

The General Manager of the European Business Unit of BESIX together with the General Managers of the BESIX Group entities belonging to the CO2 performance ladder's Organizational Boundary are the end responsible for the implementation and follow-up of the CO2 management within the Organizational Boundary and their respective area of control.

A Steering Cycle has been installed on both the level of the Organizational Boundary as individually for each (group) of companies. The Steering Cycle Responsible for the Organizational Boundary is the QHSE Manager of BESIX.



4.3. Baseline year

The baseline year is 2019.

4.4. Reporting period

January 01, 2023 until June 30, 2023

4.5. Verification

As a verification of the CO2 footprint is, as per CO2 performance standard requirement, included in the certification and yearly follow-up audit by the independent Third Party Auditor, it has been decided not to perform an additional external verification of the CO2 footprint by an independent institution.

5. Demarcation

5.1. Organizational boundaries

The demarcation of the Organizational Boundary is based on the 'operational control' methodology as per GHG protocol and the lateral method as per CO2 performance ladder standard requirements.

A company has operational control over an operation if the company (or one of its subsidiaries) has the full authority to implement its operating policies and procedures. Under the operational control approach, 100% of scope 1 (direct) and 2 (indirect) emissions from operations over which the company has operational control are accounted for. Emissions from operations where-over the company has no operational control are not accounted for.

The companies included in the CO2 performance ladder Organizational Boundary are:

- BESIX Business Unit Europe (BE+FR+NL+LUX+IT)
- BESIX Environment (BE+FR+NL+LUX)
- BESIX Nederland (NL)
- BESIX Infra (BE)
- BESIX Infra Support (BE)
- BESIX Unitec (BE) with its subsidiaries BESIX Connect (BE), BESIX Unitec Automation (BE), BESIX Unitec Nederland (NL) and Appermont Gebroeders (BE)
- Franki Foundations Belgium (BE) with its subsidiaries Franki Grondtechnieken (NL) and Atlas Fondations (FR)

Projects executed under the operational control of one of the companies mentioned above are included in the carbon footprint calculation of the CO2 performance ladder Organizational Boundary.

5.2. Organizational changes

No significant organizational changes took place in the first semester of 2023.

5.3. Projects with CO2-related award advantage

Within the CO2 performance ladder Organizational Boundary the following projects are awarded with a specific CO2-related award advantage:

Project	Project description	Operational control	Status
De Groene Boog (NL)	Construction of a new motorway (A16) including a 100% CO ₂ neutral tunnel	Operating policies and procedures by the JV partner (Dura Vermeer)	Ongoing
Bediencentrale Den Haag (NL)	Construction of a new infrastructure control building	Operating policies and procedures by the JV partner (Vialis)	Ongoing
Oosterweel link - Right bank - TM ROCO (BE)	Renovation of the ring road R1 (right bank) around Antwerp	Joint venture specific operating policies and procedures	Ongoing
Knooppunt De Nieuwe Meer (Amsterdam)	Renovation junction De Nieuwe Meer	Operating policies and procedures by the JV partner (Dura Vermeer)	In preparation, works expected to start in Q3-2023
VOVK South-East Limburg Netherlands	4 year maintenance contract for roads & infrastructure in the region South-East Limburg Netherlands	Operating policies and procedures by the JV partner (BESIX Infra NL)	Ongoing, started in January 2023
A27 Houten Hooipolder	Renovation of the A27 between Houten and Everdingen		In preparation, works expected to start in Q3-2023

R4WO - EPC (BE)	Renovation of the ring road R4 around Ghent	BESIX (Joint venture project)	Preferred bidder, contract close expected mid-2024
Via15	Extending the existing highway A15 for 12 kilometers	Joint venture (GelreGroen) specific operating policies and procedures	On hold

In addition of the above list of projects with a CO2-related award advantage: for the Oosterweel link Scheldt tunnel project the consortium TM COTU offered in her bid a carbon footprint calculation and progress monitoring of the project. The project will be executed with Joint Venture specific operating policies and procedures. A scope 1, 2 & 3 carbon footprint reporting is performed separately on a half-yearly basis.

Emissions and reductions of projects with a CO2-related award advantage for which BESIX has no operation control are separately reported. More information on these projects can be found in chapter and on www.CO2projectplan.nl. This website is an initiative of BESIX together with some other large Dutch construction companies with the objective to exchange knowledge about carbon reduction within the sector.Knoop

6. Calculation methodology

6.1. Current calculation method and conversion factors

The carbon footprint was calculated in accordance with the GHG protocol and version 3.1 of the CO2 performance ladder manual as published by SKAO in July 2020.

In general, the conversion factors as published on www.CO2emissiefactoren.nl are used for the carbon footprint calculation of the Org. Boundary whereby SKAO's modification list is considered to be leading. These conversion factors are kept up-to-date by the software provider 'Smattrackers'.

Where possible, emissions related to the use of procured electricity are calculated based on the market-based approach. In this approach, location-specific conversion factors are applied for the 'grey' electricity part within the energy mix. Source of information for Belgium, French and Italian conversion factor for 'grey' electricity is the International Energy Agency (IEA). BESIX is supported by the consultant CO2logic for keeping these location-specific conversion factors up-to-date.

A specific conversion factor for 2-takt has been determined based on literature. The impact of this emissions stream is however very limited.

6.2. Changes in calculation methodology

Following the internal audit carried out by the consultant 'Smattrackers' on 13/04/2022, the emissions related to fuel for heavy site equipment provided by BESIX Infra to its subcontractors have been changed from scope 3 to scope 1 emissions. As a consequence, the footprint of the reference year and reporting period has been recalculated. As this change was made during the drafting of this report, the change has been taken into account in this reporting.

There are no other changes to mention for the used calculation methodology.

6.3. Exclusions

According to ISO14064-1, direct and indirect GHG sources which are defined as not material or whose quantification would not be technically feasible or cost effective, may be excluded from the carbon footprint calculation.

In the CO2 performance ladder Organizational Boundary footprint the following carbon emissions are excluded:

- Air condition refrigerants (mainly used for (site) offices): as leakage of air condition refrigerants are rare and minimal this is considered as not relevant and material;
- Cutting & welding gasses such as acetylene and oxygen - often used on site in small quantities but research on the significance shows that the effort for data collection would not be proportional with the significance in the carbon footprint;
- Lubricants used to protect internal combustion engines. Research shows that the effort for data collection would not be proportional with the significance in the carbon footprint. Exception is on the use of Ad Blue which has been taken into account in the carbon footprint calculation;

6.4. Absorption of CO2

CO2 absorption or capture is not applied within the CO2 performance ladder Organizational Boundary.

6.5. Biomass

No biomass other than the additives in standard fuel blend is used within the CO2 performance ladder Organizational Boundary. Combustion of biomass is not applicable. GHG sinks and removals are also not applicable.

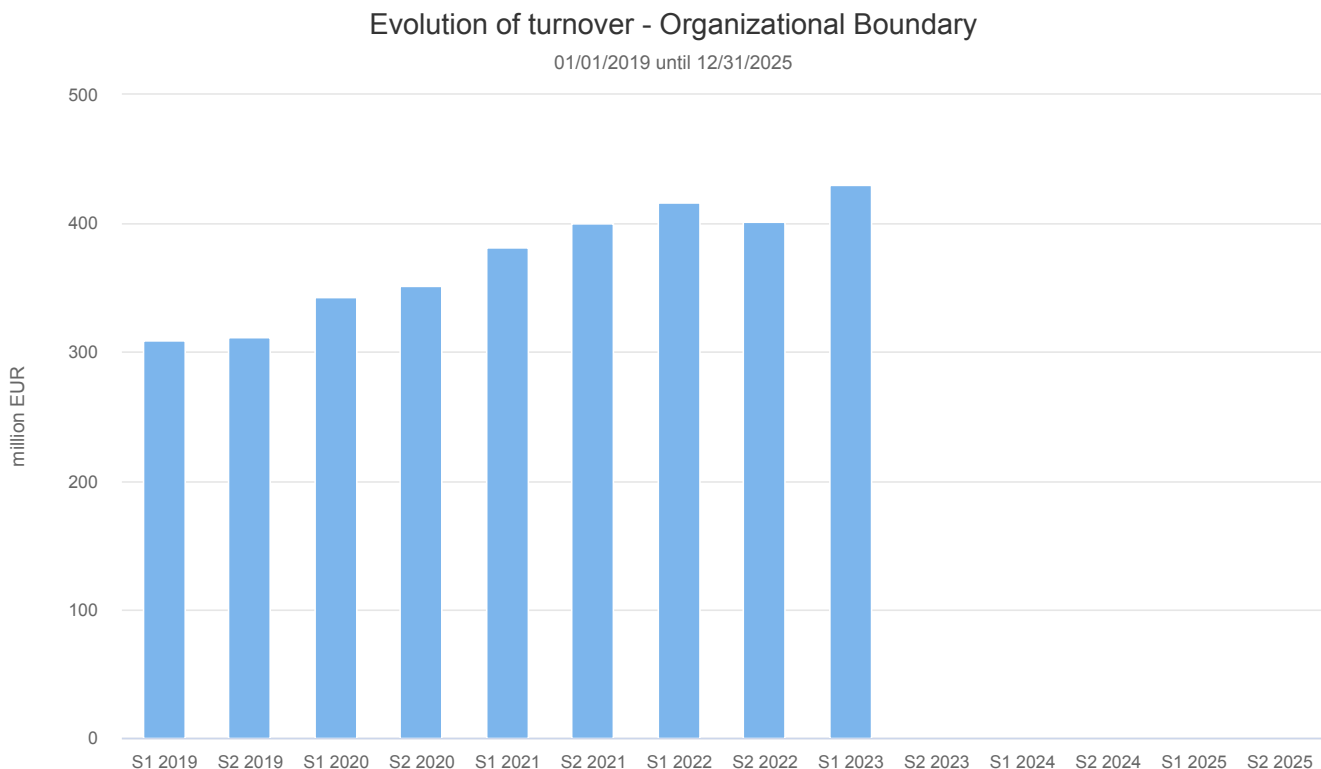
6.6. Uncertainties

The following uncertainties can be considered in the interpretation of the carbon footprint calculation of the CO2 performance ladder Organizational Boundary:

- the data source used for the calculation of the scope 1 & 2 carbon footprint mainly comes from invoices (electricity, natural gaz,...), reporting by the supplier (electricity, fuel for on-road and off-road equipment, business travel,..) based on real consumption data and/or by meter reading. The margin of error can be considered as very small.
- if the data on purchased quantities is not available, for example in case of advance payment invoices for electricity and/or natural gaz, conservative estimations are made based on the consumption of the previous years. Corrections are made retro-active once the final invoice is available and no later than in the reporting of the following period. The margin of error can be considered as very small.
- the scope 3 carbon footprint is depending of the company based on primary data (units of measurement) and/or secondary data (financial data - spent) combined with sector conversion factors to convert financial data into units of measurement (volume, square meters, weight,..) and sector emission factors retrieved from Dubocalc (National Environment Database of the Netherlands), LCA software 'One Click LCA' and Environmental Product Declarations. As a result the margin of error must be considered as quite important. The purpose is to go more in detail over time in order to obtain more accurate data.

7. Evolution of turnover Organizational Boundary

As an intensity target (emissions per million euro turnover) is used in both the overall reduction ambition as in a number of sub-KPI's, the evolution of the turnover has a direct impact. The graph below shows the evolution of the consolidated turnover for the Organizational Boundary.

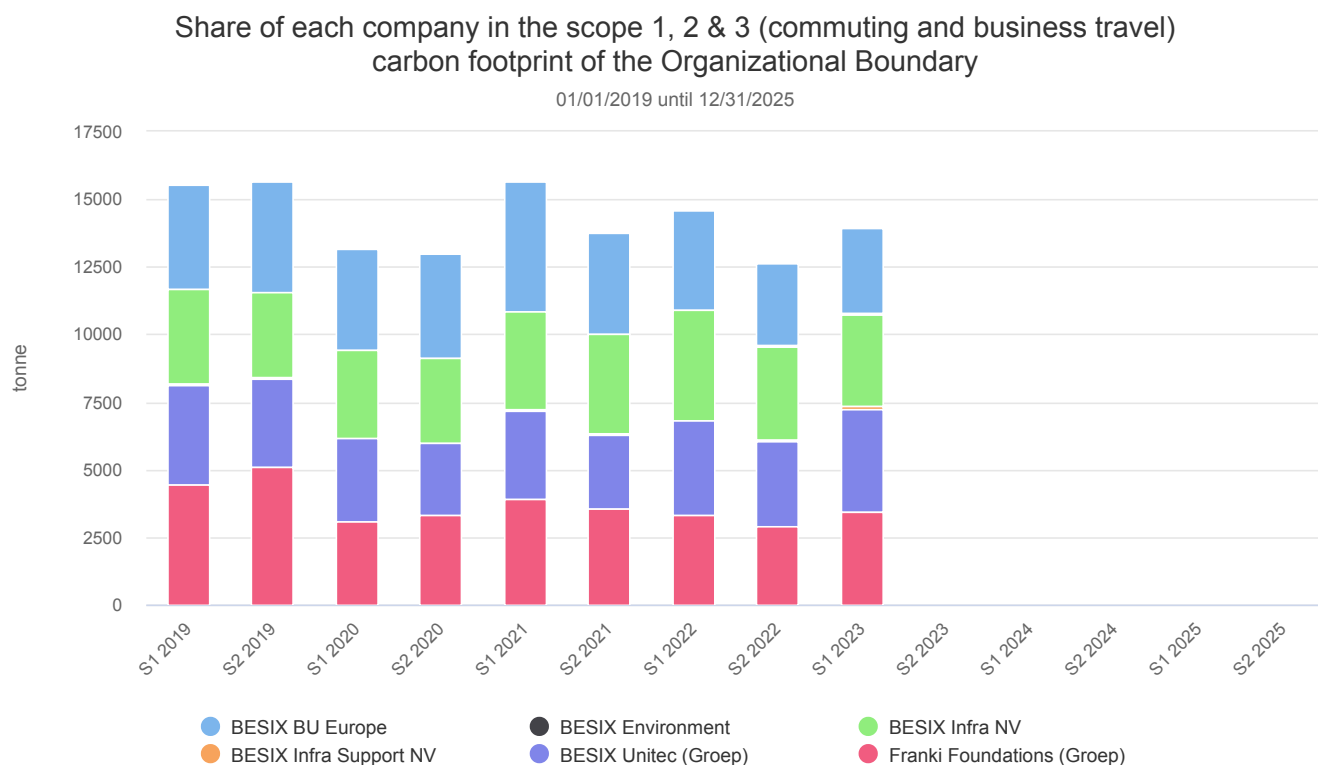


As indicated in chapter 5.3, only projects executed under the operational control of one of the companies of the Org. Boundary are included in the turnover and thus carbon footprint calculation of the CO2 performance ladder's Organizational Boundary.

8. Scope 1 & 2 + commuting and business travel related emissions

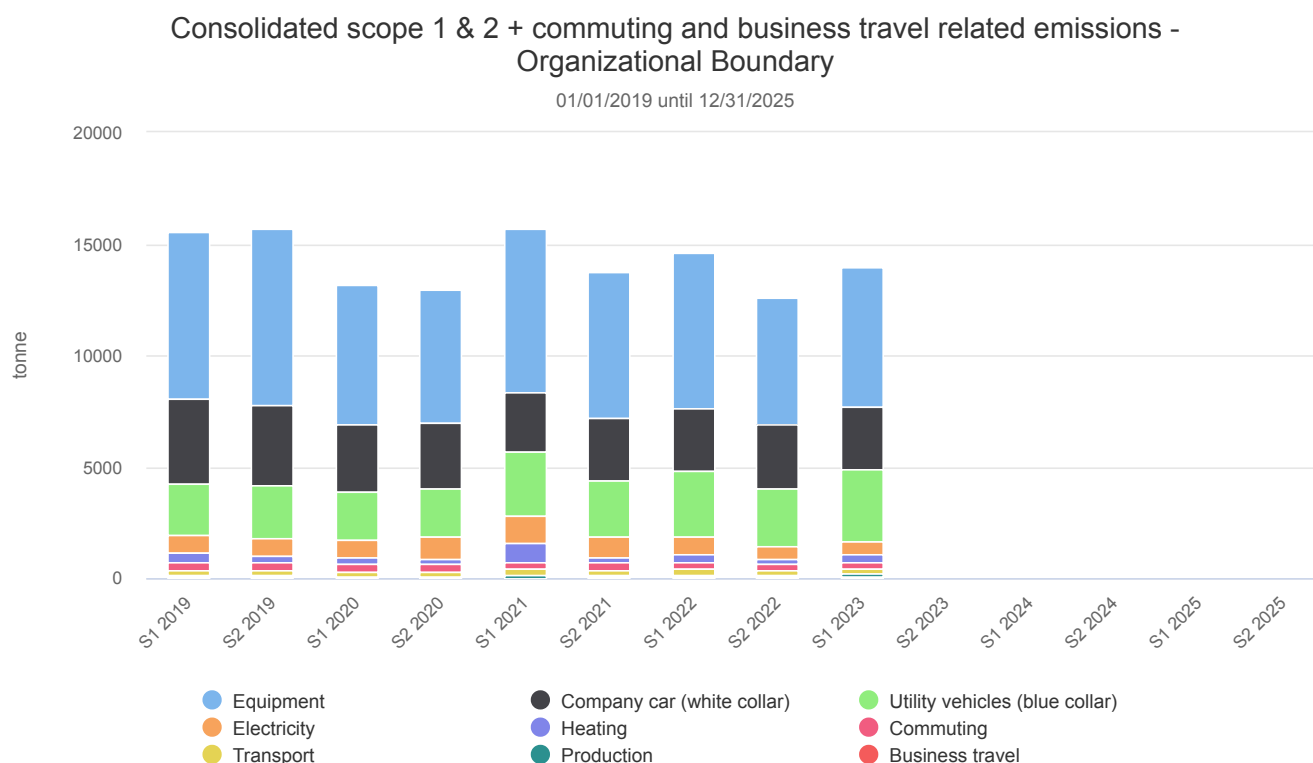
The scope 1, 2 & 3 (commuting and business travel) carbon footprint is a means to clarify how the CO2 emissions are distributed throughout the organization and subsequently to analyze and reduce the largest energy flows and emissions contributors. The inventory of the emission sources is made visual in the software application 'Smartrackers' and in document 'Inventory scope 1, 2 & 3 emission categories'.

As a first step, the share of each company in the consolidated scope 1, 2 & 3 (commuting and business travel) carbon footprint of the Organizational Boundary is made transparent in the below graph.



8.1. Evolution consolidated scope 1 & 2 + commuting and business travel related emissions of the Organizational Boundary

The consolidated carbon footprint consists of all scope 1 & 2 + commuting and business travel related emissions of the companies belonging to the Organizational Boundary. As some important reduction measures (electrification of the company car fleet, procurement of green electricity, electrification of plant & equipment, renovation of offices,...) are implemented as from 2022, we expect to see an important reduction in absolute carbon emissions in the coming years.



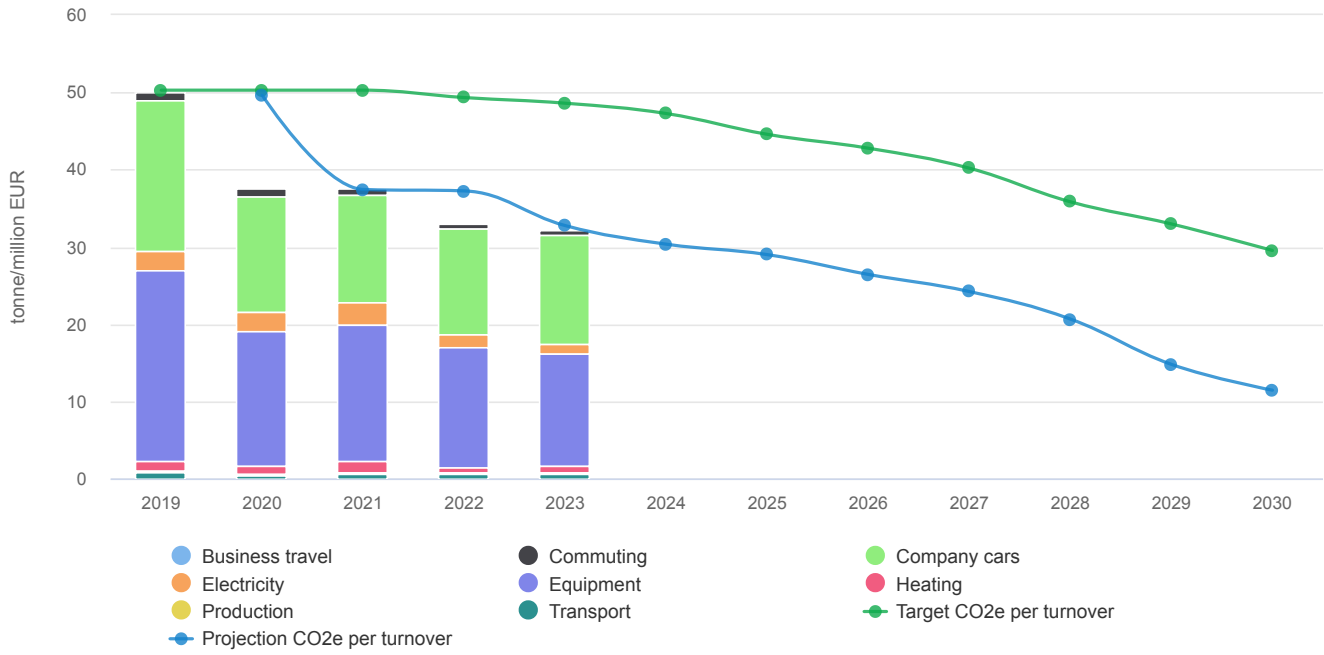
8.2. Evolution consolidated scope 1 & 2 + commuting and business travel related emissions of the Organizational Boundary per million euro turnover

Below graph shows the evolution of the consolidated scope 1 & 2 + commuting and business travel related emissions (related to turnover) for the Organizational Boundary. End June 2023, a slight decrease is shown compared to end 2022.

Taking into account the ongoing electrification of the company car fleet, the renewal of the energy frame agreement and the ongoing renovation of BESIX Infra & BESIX Unitec's office into a sustainable building we expect to see a further reduction in (absolute) carbon emissions in the years to come. The projection of expected carbon emissions taking into account the planned and implemented reduction measures show that we remain on track to reach our 2030 scope 1 & 2 reduction targets.

Scope 1 & 2 + commuting and business travel related emissions - Organizational Boundary

01/01/2019 until 12/31/2030



9. Progress scope 1 & 2 carbon reduction programme

The scope 1 & 2 carbon reduction programme focuses on the following main emission sources:

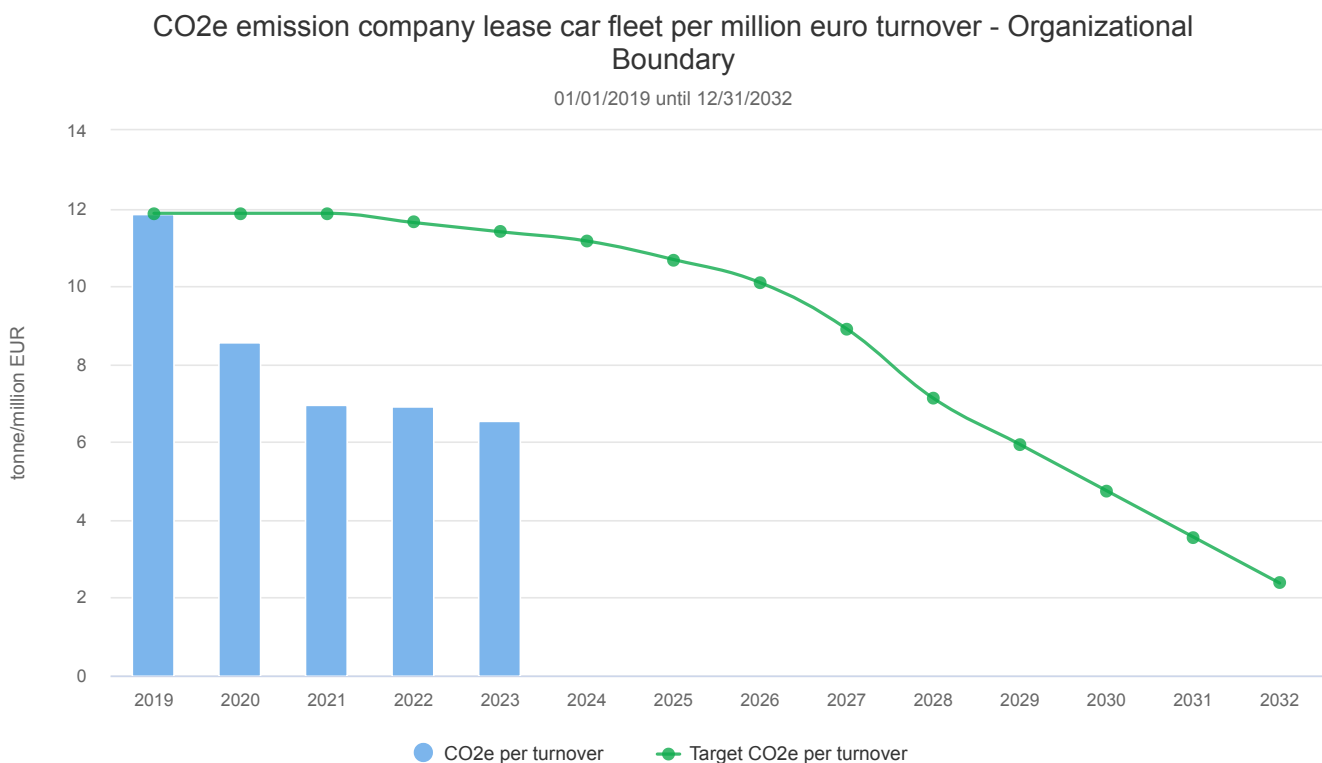
- company car fleet (company lease cars, utility vehicles)
- electricity
- heavy site equipment

9.1. Company lease car (white collar)

The overall ambition is to reduce by end 2032 the emissions from the company lease cars to zero. As BESIX and the underlying entities have no control on the type of electricity (green/grey) used at public charging stations or by the employee for charging the company lease car at home, a reduction target of 80% by end 2032 has been defined out of caution. Electricity used for charging electric vehicles at the office, fixed installations and/or projects is not included in this parameter but in the 'electricity' parameter mentioned in chapter 9.3

Intermediate intensity reduction targets have been determined and are made visible in the chart below.

The reason for the important decrease in 2020 and 2021 is, above the impact related to the COVID-19 crisis, also due to a change in allocation of the fuel of company lease cars within BESIX Unitec in 2020 and within BESIX Connect after the merger of Larabo and Uniconnect early 2021. Also the further detailing and breakdown of the fuel cards within Appermont (in 2019 and 2020 there was no distinction between fuel for company lease cars, utility vehicles and trucks while this was reported under 'company lease cars') had an impact on the decrease of these emissions.

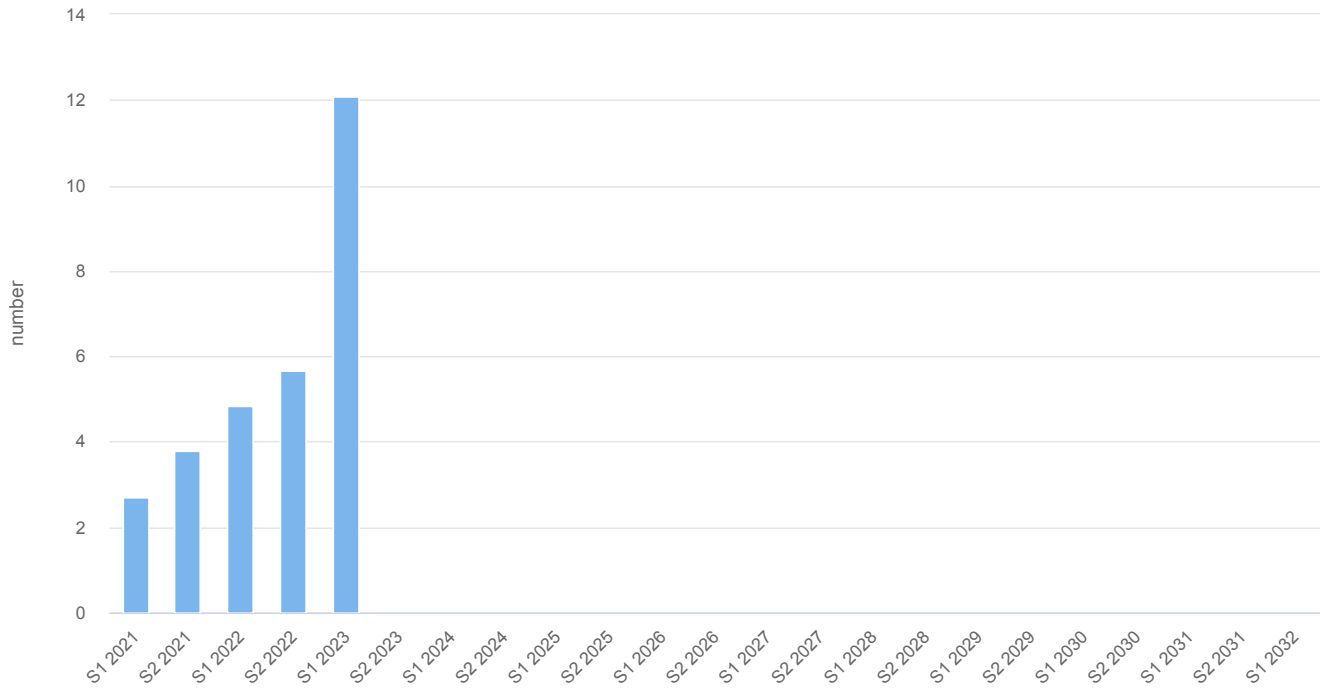


In addition to the carbon footprint related to turnover, a KPI '% zero-emission company lease cars' has been set. By end 2025, 10% of the company lease cars must be zero emission vehicles. 40% is targeted by no later than 2028 and 100% of zero emission company lease cars by no later than 2032.

A graph indicating the percentage of zero-emission company lease cars in the company lease car fleet of the Organizational Boundary has been added below. It clearly shows that the 2025 intermediate target has already been reached mid-2023. We expect to see the first impact of this increase of electric cars on the carbon emissions in the 2023 full year reporting.

% zero-emission company lease cars - Organizational Boundary

01/01/2021 until 06/30/2032



Progress in 2023:

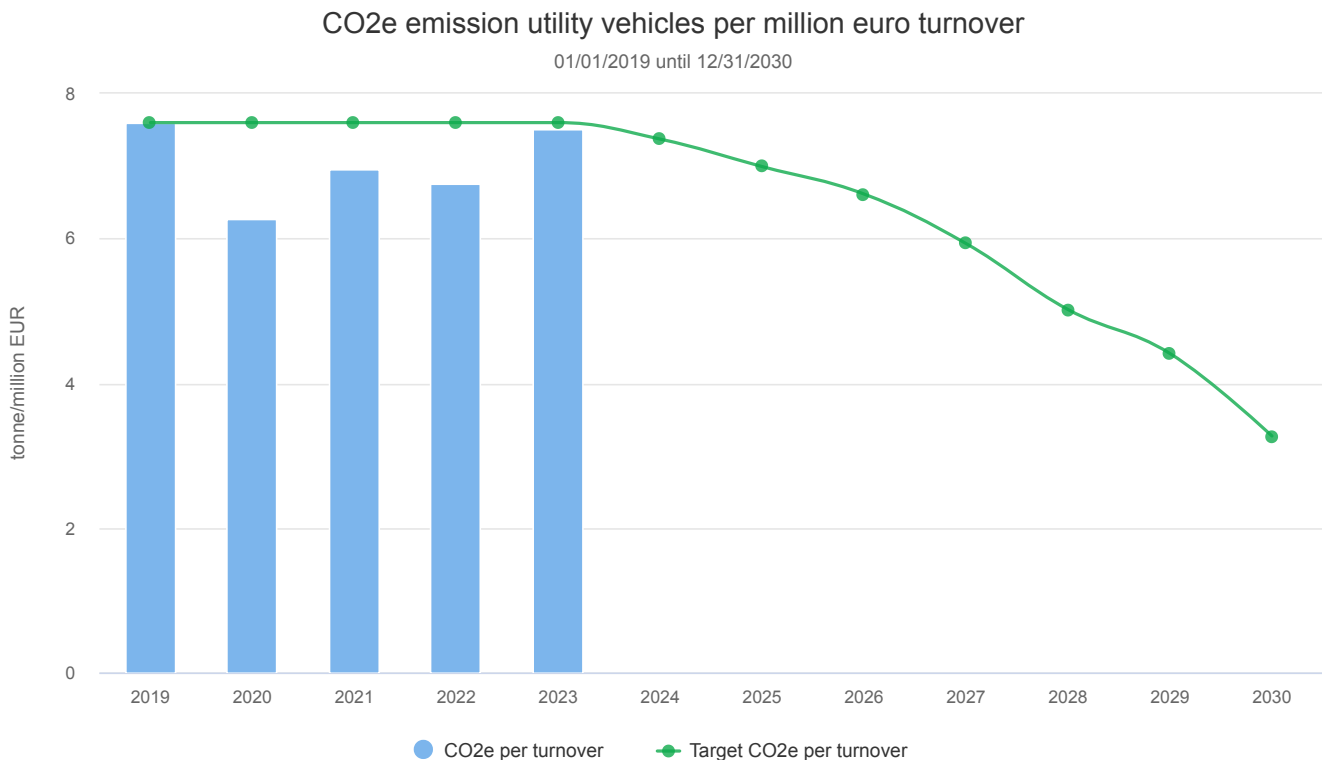
- Within BESIX Belgium and Franki Foundations Belgium, all new company lease cars with an expected annual mileage < 25.000km are full electric since January 2022. As from mid-2023 this principle is also applied for all new company lease cars regardless the expected annual mileage.
- Within BESIX Netherlands, all new company lease cars are full electric as from January 2022.
- As the activities of BESIX France are mainly situated in Paris and due to the limited availability of charging stations in this dense city environment, the shift to full electric company lease car will start as from January 2024.
- The other regional entities belonging to the Org. Boundary have integrated a number of electrical company cars in their company lease car pack without a formal obligation for the employee to shift to a full electric company lease car. The shift to a full electric car is however promoted by the fleet manager of each regional entity.
- To facilitate the transition, BESIX further expanded in 2023 the amount of charging points at her offices and fixed installations by installing :
 - 12 additional charging points on the premises of BESIX Infra and BESIX Unitec in Schelle (above the already 10 charging points installed).
 - 12 charging points at the site of BESIX Infra and BESIX Unitec in Bilzen
 - 6 charging points at S&F and S.M.D in Sint-Pieters-Leeuw
- Also in the first half of 2023, the roadmap for installing charging points at site level has been initiated by S.M.D (BESIX).
- In the second half of 2023 additional charging points will be installed at BESIX's Head Office in Brussels and at the concrete recycling & batching plant of BESIX Infra in Burcht.
- BESIX Infra acquired 30 robust mountain bikes, tailored to the needs on site, to be used as an eco-friendly alternative to conventional fuel vehicles as an alternative to on-site travel.



9.2. Utility vehicles (blue collar)

The overall ambition is to reduce by end 2032 the emission from the fleet of utility vehicles lease to zero. As BESIX and the underlying entities have no control on the type of electricity (green/grey) used at public charging stations and by the employee for charging the utility vehicle at home, a reduction target of 80% by end 2032 has been defined out of caution. Electricity used for charging electric vehicles at the office, fixed installations and/or projects is not included in this parameter but in the 'electricity' parameter mentioned in chapter 8.3

Intermediate intensity reduction targets have been determined and are made visible in the chart below.



In addition to the carbon footprint related to turnover, a KPI '% zero-emission utility vehicles' has been set. By end 2025, 7% of the utility vehicles must be zero emission. 34% is targeted by no later than 2028 and 100% of zero emission utility vehicles by no later than 2032.

As no electric utility vehicles are yet introduced within BESIX Group, the graph for making the progress visual is not yet embedded in the reporting.

Progress in 2023:

- Following the first test phase in 2021, BESIX tested again a number of electric utility vehicles in the first half of 2023. The outcome of the test showed that the actual range of these electric utility vehicles remains an issue. A minimum range of 300km in winter conditions is targeted.
- Nevertheless decision was taken to acquire two electric utility vehicles by SMD (BESIX) for further testing. The first utility vehicle was delivered in summer 2023.

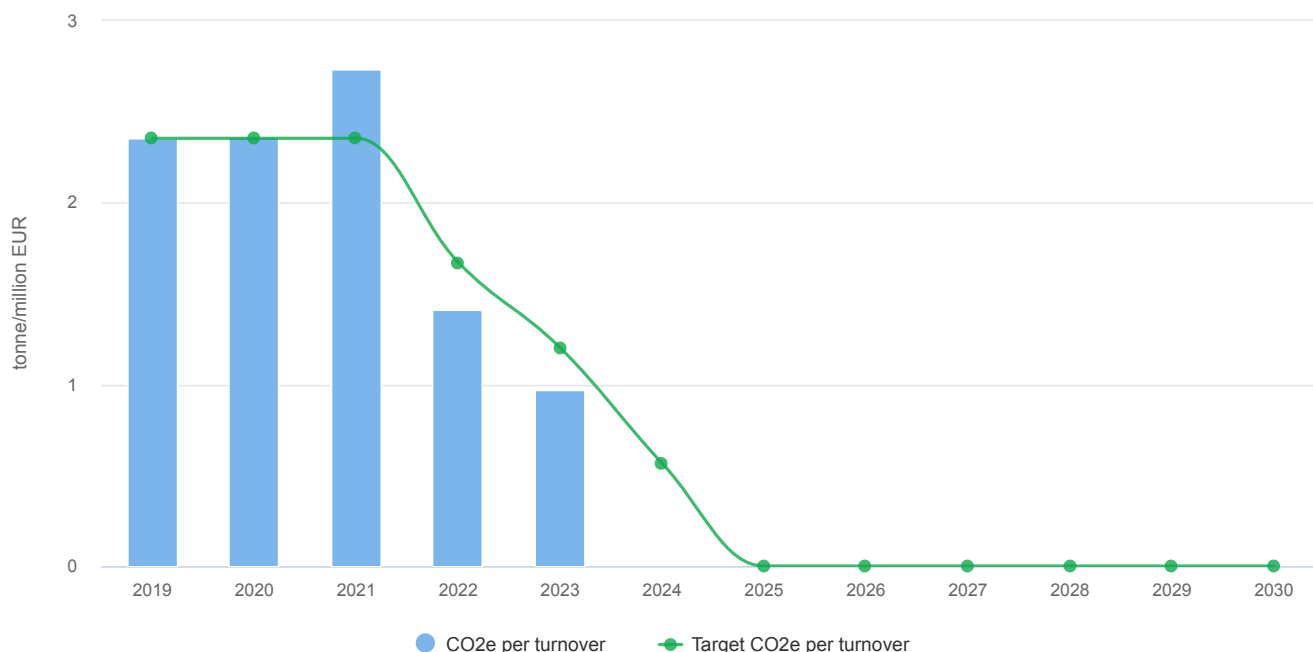
9.3. Electricity

The overall ambition is to reduce the emissions related to the use of electricity for the offices, fixed production facilities (work shops, steel & formwork SPL BESIX, concrete batching plants BESIX Infra,...) and projects to zero by end 2025. This ambition applies only to the offices, fixed production facilities and projects for which we have a direct impact on the type of energy contract. Electricity used for charging electric vehicles at these locations are included in this ambition.

Leased offices where electricity is part of the rental fee and where we thus have no direct impact on the type of energy contract, are not taken into account in this ambition. The same applies for projects where energy is provided by the Client.

CO2e emissions purchased electricity per million euro turnover for locations with a direct impact on the type of energy contract- Organizational Boundary

01/01/2019 until 12/31/2030



Progress in 2023:

- The BESIX Group framework contract for the delivery of electricity for offices and fixed installations has been renewed in 2021 and this for 2022 & 2023. Since January 2022, the purchased electricity for the Belgian Head Office in Brussel and SPL originates for 100% from Belgian renewable sources as per CO2 performance ladder definition.
- The electricity contract for the BESIX France office in Paris has been renewed in August 2022 and changed into a 100% green contract.
- The electricity for the BESIX Nederland office in Dordrecht was 100% green (Dutch wind). However the contract has been changed in December 2022 into a contract with 100% European Wind energy. As per CO2 performance ladder definition this is taken into account as from December 2022 as grey electricity (not demonstrably produced in the Netherlands).
- In Q4-2022 the BESIX Group frame agreement for the supply of electricity on the Belgian projects was renewed. The contract contains the delivery of 100% Belgian green energy but as the energy mix also includes a biomass component, it is not considered 100% green. It is estimated that about 75% of the electricity supplied can be considered as green according to the CO2 performance ladder definition. The new framework contract entered in force in January 2023.

- The construction works for the renovation of the BESIX Infra and BESIX Unitec office in Schelle are ongoing. By mid-2024 the current building will be transformed into a Smart Building which will communicate and exchange energy with the local grid.
- A 4,5 MW windmill, built by Engie and Wind4Flanders on the premises of BESIX Infra in Bilzen, was inaugurated in the first half of 2023. This windmill provides as from May 2023 al large part of the electricity required for the office, recycling plant & ready-mix concrete batching plant in Bilzen.



- In the first half of 2023, Third-Party energy audits have been performed on the head office of BESIX in Brussels and the office and production facility of BESIX Infra in Bilzen.

9.4. Heavy site equipment

As per observation made by the consultant 'Smartertrackers' during the internal audit of 13/04/2022, the allocation of the emissions of the fuel provided by BESIX Infra to its subcontractors for their heavy site equipment has been changed from a scope 3 to a scope 1 emission.

This means that the actual intensity reduction target has been reviewed and split-up between an intensity reduction target related to the fuel for owned equipment and an intensity reduction target related to the fuel provided by BESIX to its subcontractors:

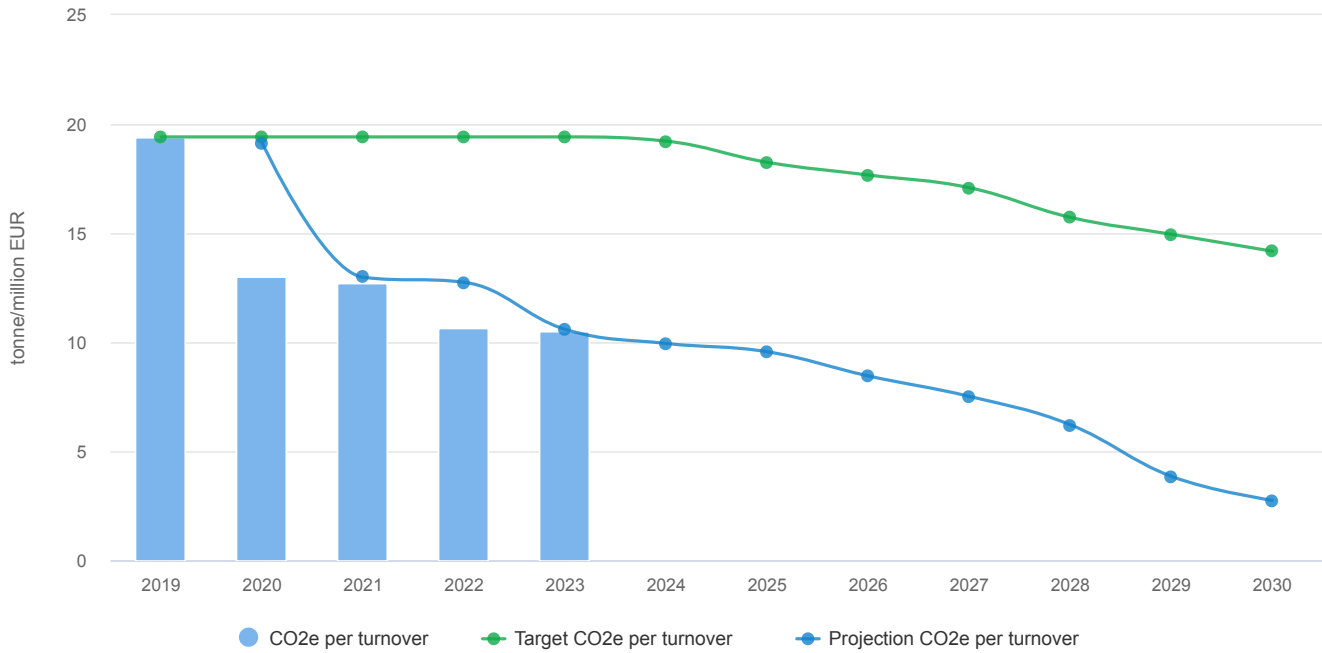
- minimal 27% reduction (related to turnover) for the emissions related to the use of fuel for owned heavy site equipment by no later than 2030 related to the reference year 2019
- minimal 25% reduction (related to turnover) for the emissions related to the use of fuel provided by BESIX Infra to its subcontractors for their heavy site equipment by no later than 2030 related to the reference year 2019

This is monitored by the following performance indicators:

- carbon footprint related to the use of fuel for owned heavy site equipment compared to turnover.
- carbon footprint related to the use of fuel provided by BESIX Infra to its subcontractor for their heavy site equipment compared to turnover

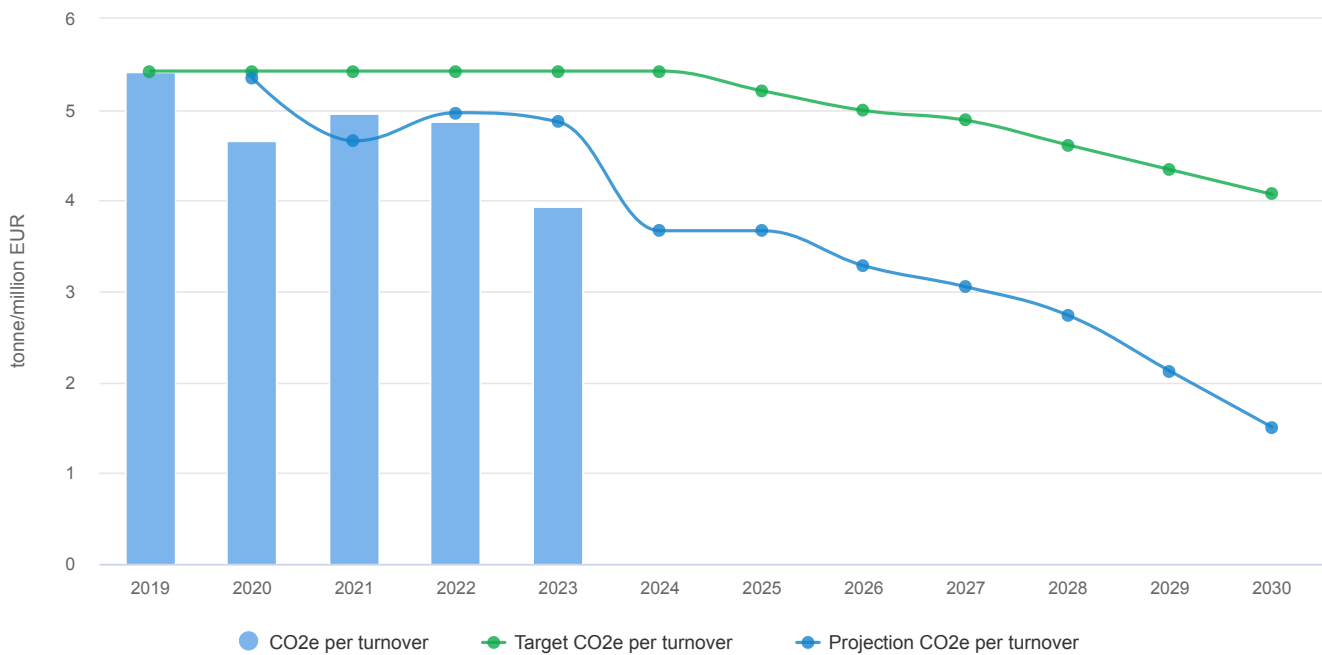
CO2e emissions owned heavy site equipment per million euro turnover - Organizational Boundary

01/01/2019 until 12/31/2030



CO2e emissions related to fuel provided by BESIX Infra to its subcontractors heavy site equipment

01/01/2019 until 12/31/2030



Progress in 2023:

- In 2022, BESIX has received its first electric (battery pack) powered 55 tons crawler crane with a proven autonomy of 10 hours. Beginning 2024, the fleet of electric heavy equipment will be expanded with a first full electric rotative telehandler.
- At the Groene Boog project in the Netherlands, the use of alternative fuels such as Hydrotreated Vegetable Oil (HVO) is being tested extensively in collaboration our JV partners and a number of subcontractors. More than 7 million liters of HVO has been used resulting in a carbon reduction of approx. 23.350 ton in comparison with traditional fossil fuel.

- At the same project, more than 20 pieces of electrically powered heavy site equipment are used in the construction process.
- In January 2023 an on the field test of a hydrogen powered generator (with a total installed power of 110 kVA) in real construction circumstances has been performed by BESIX and BESIX Environment. This test sought to examine how far an electro-hydrogen group, combined with a battery, can meet the demand for electricity in the specific context of a construction site, in a noise free and non-polluting way. For this the hydrogen unit was connected to the largest tower crane on the site. Various parameters were assessed during a four week testing among them generator supplier reliability, facility security, employee training, transport sustainability and security of green hydrogen supply.



- BESIX Infra has procured its first electric road roller. The machine is powered by a 48 volt LiFePO4 battery with a capacity of 600 Ah/31.5 kW for both propulsion and vibration functionalities. During operations, the electric roller harnesses recuperation technology to convert kinetic energy into electrical power.



- BESIX Unitec has completed a successful testing program of a jackhammer powered by battery packs. This will now be further rolled-out.

10. Progress scope 3 reduction program

10.1. Purchased goods and services

The scope 3 strategy in relation with purchased goods and services focuses on 'in-situ concrete' and steel products (rebar, structural steel and piles & sheet piles) including the transport and installation of these products with a primary focus on 'in-situ concrete' and this in line with the company's commitment to the 'Betonakkoord' in the Netherlands and the 'Circulair Betonakkoord Vlaanderen' in Belgium.



In the first half of 2023 the following actions in relation to the emission category 'Purchased goods & services' were undertaken:

- A full analysis on the amount and type of ready-mix concrete applied by BESIX on the Belgian projects has been realized in order to define an average carbon emission per m³ for this type of product. In the second half of 2023 and first half of 2024 this exercise will be expanded to the Netherlands and France. This value will serve as a baseline for monitoring progress in reducing carbon emissions for this type of material.
- testing of sustainable concrete mixtures at a number of projects (e.g. De Groene Boog)
- optimization of structural design by reducing the amount of concrete and steel required (e.g. Tour Triangle, COTU,...) for the realization of the project
- mapping supplier to favor local production by Franki Foundations
- participation as 'Industrial partner' in a number of research projects (see chapter 10.02.01)

BESIX Infra, in collaboration with Aquafin, have executed on the project N446 between Dendermonde and Waasmunster a test case in which the traditional concrete grez tubes are replaced by Thiotube sewer pipes. Thiotube pipes are durable, chemically resistant sewer pipes made from sulphur concrete avoiding the use of cement.



A similar testing with geopolymer concrete tubes will be performed in the second half of 2023 on an Aquafin project in Duffel. One of the main advantages of using geopolymer concrete is its significant lower CO₂ footprint compared to traditional concrete.

10.2. Use of sold products

10.2.1. Research groups - New materials

BESIX Group participates as 'Industrial partner' in several research projects. These include the creation of sustainable and recycled concretes with the University of Ghent and the Block Research Group of ETH Zurich, innovative concretes (such as the European Smartincs project for self-healing concretes).

3D2BGreen

SMARTINCS
SELF-HEALING • MULTIFUNCTIONAL • ADVANCED REPAIR TECHNOLOGIES IN CEMENTITIOUS SYSTEMS

LIFEMACS

3D2BGreen (2019-2022) is a research project on 3D printing of concrete, set up by Ghent University, BESIX, the start-up ResourceFull and the engineering company Witteveen+Bos. The research focuses on the development of sustainable concrete mixes suitable for printing units specifically for marine works.

The project is being developed under the aegis of SIM Flanders (Strategisch Initiatief Materialen) and is subsidised by the Flemish Region (VLAIO). It will improve knowledge about sustainable and cost-effective mixtures for 3D printing.

More information is available on [3D2BGreen](#) | [SIM-Flanders](#)

Another example of his type of collaboration is the circular pedestrian bridge that BESIX is building for the A16 project in Rotterdam, the Netherlands. The design was carried out by BESIX Engineering and the Block Research Group. It focuses on the principles of "strength through geometry", which means that no reinforcement is needed. For the construction, they designed a flexible formwork system, a textile made of recycled and natural fibres, which is easy and quick to assemble. The concrete itself is innovative. It is "green concrete", meaning made from recycled concrete. Thanks to its structure, building the bridge will require less material, thus reducing the addition of cement.



One of the latest initiatives is the participation in the research project SMARTINCS on self-healing concrete. Funded by the EU Horizon 2020 research and innovation program, the SMARTINCS project aims to incorporate life cycle thinking into the execution of concrete structures. By integrating self-healing materials, this initiative seeks to prolong the service life of concrete projects while reducing maintenance and repair costs, as well as the need for demolition and reconstruction.

As an industrial sponsor, BESIX provided researchers with the opportunity to test self-healing repair methods under real job site conditions and evaluate construction procedures. Nine trial concrete walls, 2m² and 10cm thick, were constructed on the Henneaulaan bridge site in Zaventem, adhering to authentic job site execution conditions.



The researchers are currently monitoring and testing the effects and benefits of the self-healing agents. After the research and development phase, if the test yield positive results, several subsequent steps, including certification, standardization and commercialization will be taken to bring the solution to the market.

10.2.2. Smart Buildings

Since 2018, BESIX is partnering with Proximus in the field of Smart Buildings. These buildings integrate new technologies improving their performance, in particular comfort, sustainability, maintenance and hospitality. In addition to assisting their tenants and owners to be more efficient and comfortable, smart buildings optimize energy consumption and simplify maintenance through remote inspection and by automatically detecting anomalies. All this is enabled by cutting-edge technologies such as digital twins, the Internet of Things, data science and artificial intelligence.

The office of BESIX Nederland in Dordrecht is [an example of a next-generation smart building](#) that can be considered as an European reference in this field. In 2023 the office of Socoetra, a BESIX Group company, will move to their new office which is also a smart building. The same sustainability principles will be applied in the renovation of BESIX Infra and BESIX Unitec office in Schelle. This office will be operational in 2024.

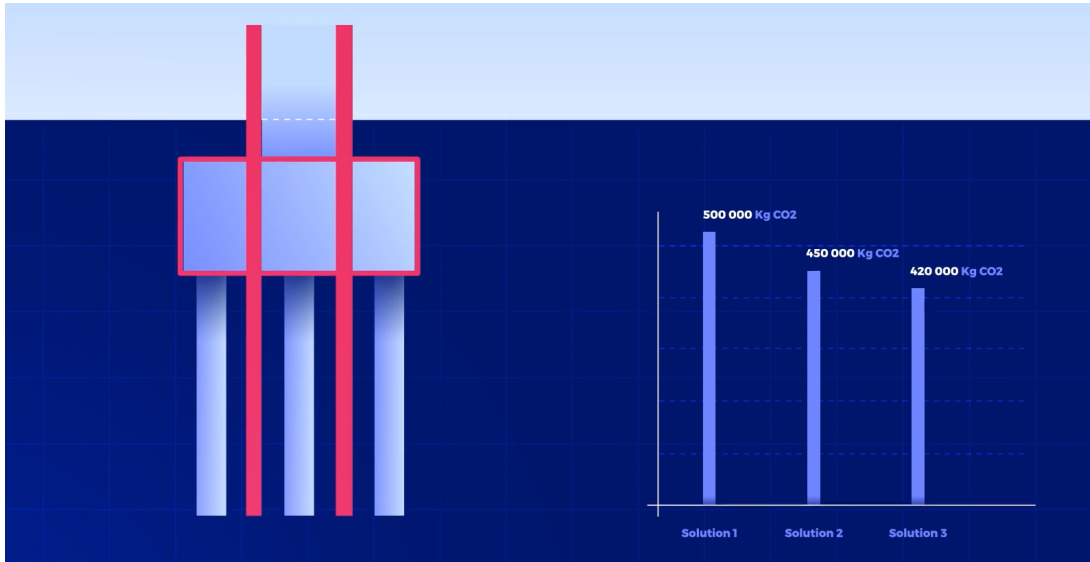
10.2.3. Carbon as a design parameter

In 2021 a competence center related to Life Cycle Analysis has been set-up within BESIX Engineering Department with the objective to implement carbon as a controlling parameter in design. In 2022, CO₂-impact based on the primary design data/quantities has been implemented in several tenders, allowing the identification of carbon hotspots and proposal of sustainable alternatives. In 2023 this approach has been tested on a number of projects in execution in order to create an internal benchmark. In order to facilitate the process, an automated script to link a BIM model and the LCA application has been created.

A methodology to integrate CO₂ as a parameter in parametrical design process has been developed.

In the Netherlands a specific training program on 'MKI - ECI (Environmental Cost Indicator)' has been rolled-out.

Both BESIX Nederland and Franki Foundations have embedded this approach in their tenders. For every tender and depending on the interest of the Client, a light or more detailed carbon footprint and/or ECI (Environmental Cost Indicator) calculation is added to the tender while proposing more sustainable alternatives.



10.3. End-of-life treatment of sold products

In 2021 BESIX Engineering Department has initiated a research and development project related to material passports with the objective to facilitate the transformation towards a circular economy. This led to the development of the BESIX material passport with a primary focus on finishing materials for buildings but which can be expanded to other construction types.

The independent research entities BBRI, OVAM and The Engineering Network were involved as reviewer in the development process.

In 2022 the research development project has continued with the development of a 'Material Passport' procedure, the implementation of a training program and the try-out on some pilot projects. The planned integration in BIM has been stopped as in the meantime a number of publicly available solutions exists.

10.4. Commuting and business travel

Business travel by air is not one of the most relevant scope 3 categories within the European Business Unit of BESIX. However, taking into account the international context of the company (which is not part of the CO2 performance ladder Org. Boundary) a 'Sustainable Business Travel' policy has been developed and implemented in 2023.

11. Value-chain analysis

11.1. In-situ concrete - circular pedestrian bridge Lage Bergse Bos

BESIX, as member of the Joint Venture 'De Groene Boog', aims to construct a circular funicular construction bridge with knitted formwork in Rotterdam, the Netherlands.

The design of the bridge focuses on the principles of "strength through geometry", which means that no reinforcement is needed. For the construction, it is intended to use a flexible formwork system, a textile made of recycled and natural fibres, which is easy and quick to assemble.

The concrete mixture which will be applied will be "green concrete", meaning made from recycled concrete. Thanks to its structure, building the bridge will require less material, thus reducing the addition of cement.

The value chain analysis will be executed in 4 different phases:

Phase	Item	Planning	Status
1	- Basis of design - Architectural design - Communication plan internal & external stakeholders	Q2/Q3-2021	- Basis of design has been executed (May 2021) - Paper on the project has been published - Presentation of the project on the IABSE Congress Ghent (September 2021)
2a	- Stability study - Determination of execution methodology and materials - Drawings	Q1/Q3-2022	- Stability study has been executed (Q4-2022) - Execution methodology has been defined (3D printing instead of knitted formwork) (Q4-2022) - Detailed design has been finalized
2b	- Realization of prototype - Testing of prototype - Decision for phase 3	To be defined in phase 2a	Foreseen as from Q3-2023
3	- Fine-tuning execution methodology - Realization pedestrian bridge - Carbon reduction calculation	To be defined after approval at the end of phase 2b	

11.2. Sustainable heavy site equipment

The use of heavy site equipment is an important contributor to the carbon footprint of a construction project. Most of this heavy site equipment belongs to our subcontractors and/or suppliers.

Together with some important subcontractors, a number of initiatives have been launched with the objective to make our heavy site equipment more sustainable:

- in 2020 a workgroup has been created with Franki Foundations and S.M.D. to search for innovative solutions. This workgroup has made a market analysis with the objective to define opportunities in relation with the use of alternative fuels (HVO, biogas,...), electrification of equipment and the use of battery systems. In 2022 this workgroup has been expanded with some regional entities (BESIX Infra, BESIX Unitec,...) of BESIX Group.
- testing the use of Hydro Treated Vegetable Oil (HVO) as fuel for the concrete mixers on the Groene Boog project in collaboration with the in-situ concrete supplier. In the meantime more than 7 million liter of HVO has been used resulting in avoiding approx. 23.350 ton CO₂.
- launch of a pilot project involving more than 20 electrically powered heavy site equipment on the project 'De Groene Boog' with the objective to learn how these types of equipment can be standardized within the construction sector. In 2023 test cases were initiated with:
 - an electric collision absorber truck (260kWh battery) - stopped as the equipment seems still too unreliable to be deployed due to breakdowns
 - an electric sawing machine - in use.

- a split spreader (asphalt set) - positive testing result
- an asphalt finishing machine / asphalt roller - called back by the supplier due to possible safety risk linked with the removable battery pack
- In 2022 a first electric powered (by battery pack) 55 tons crawler crane has been delivered. Beginning of 2024 BESIX will receive its first full electric rotative telehandler.
- Beginning of 2023, BESIX performed a test with a hydrogen power generator in real site conditions.
- In 2023 BESIX Infra has acquired its first electric asphalt roller and BESIX Unitec has successfully tested an electrically powered jackhammer.

12. (Sector)-initiatives

Apart from initiating change in our own organizations, we are also participating in or leading a number of (sector) initiatives. This is only a selection of the many internal and external initiatives we participate in.

If you want to know more, just keep an eye on our media channels for more information about the sustainable initiatives we're taking in our Group. A full list of (sector) initiatives can be found on the CO2 performance ladder webpage on the BESIX website (www.besix.com).

12.1. CO2 performance ladder in Belgium and Europe

Through the VBA-ADEB (Association of Belgian Contractors), a working group has been set up in Belgium with, among others, the federal and regional authorities, to promote the CO2 performance ladder in the Belgian construction industry.

BESIX is a founding member and part of the steering committee of this working group and plays an active role in the promotion of the CO2 performance ladder in Belgium and even Europe.

In 2023,

- BESIX participated in several meetings of the Steering Committee and workgroup 'CO2 performance ladder Belgian Companies'
- BESIX actively participated in the determination of the approach to the Belgian CO2 Performance ladder after the pilot phase (which came to an end in August 2023)
- BESIX, together with SKAO and SPW, shared its experience with the CO2 Performance ladder with the French Procuring Authorities UGAP and Asea with the objective to launch a CO2 PL pilot case in France.

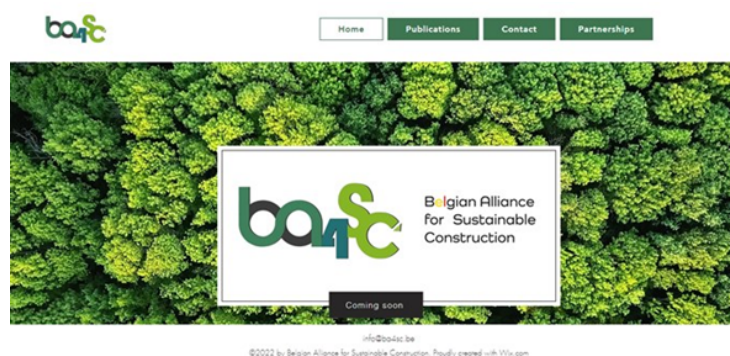
More information on <https://www.echelledeperformanceco2.be/en/news-item/co2-prestatieladder-gaat-de-grens-over-ook-bel..> and <https://www.co2-prestatieladder.be/nl>

12.2. Belgian Alliance for Climate Action

BESIX Group is a signatory of the Belgian Alliance for Climate Action (<https://www.belgianallianceforclimateaction.org/members>), launched by the non-governmental organizations The Shift and WWF Belgium in October 2020. The signatory members of the Belgian Alliance for Climate Action are thereby aligning their activities with the objectives of the Paris Agreement, i.e. to limit the rise in global temperature to a maximum of 1.5°C.

12.3. Belgian Alliance for Sustainable Construction

In 2022 BESIX, together with some colleague construction companies, worked out a sustainability strategy for ADEB-VBA which is the branche organization of large Belgian construction companies. As a member of the Sustainability steering committee BESIX is also actively involved in the initiative 'Belgian Alliance for Sustainable Construction' which has been launched in 2022.



More information can be found on [BA4SC | Belgian Alliance for Sustainable Construction \(BA4SC\)](https://www.ba4sc.be).

12.4. Betonakkoord Nederland and Circular Betonakkoord Vlaanderen

BESIX is a signatory of the Dutch 'Betonakkoord'. Together with BESIX Infra, BESIX committed in December 2022 also to the 'Circulair Betonakkoord Vlaanderen'.



BESIX Infra, via Groen Beton Vert (FPRG vzw en GBV vzw) and BESIX were, as member of the working group, project group and transition group, actively involved in the development of the "Circular Betonakkoord Vlaanderen"

More information can be found on www.betonakkoord.nl and [Circulair beton: naar een betonakkoord voor Vlaanderen \(vlaanderen-circulair.be\)](http://Circulair beton: naar een betonakkoord voor Vlaanderen (vlaanderen-circulair.be)).

12.5. CO2 projectplan

The CO2 Project Plan is a sector initiative led by BESIX Nederland gathering all large Dutch construction companies. The CO2 project plan is used on CO2 awarded projects to analyze the expected carbon emissions, including scope 3, of the project and to take measures to reduce these carbon emissions by, for example, application of saving energy measures, use of sustainable energy, design optimization, use of more sustainable materials and optimization of execution and transport methodologies.

Experiences by the members of the initiative are shared publicly and form a basis for dialogue on sustainability. By sharing experiences and inspiring each other, the initiative strive for a joint carbon reduction within the construction sector and its supply chain. It is our objective to also include our Belgian CO2 awarded projects in this initiative.

More information can be found on [CO2-Projectplan \(co2projectplan.nl\)](http://CO2-Projectplan (co2projectplan.nl))

12.6. District heating network Vlaanderen

As a member of the branch organization 'Warmtenetwerk Vlaanderen' BESIX Unitec supports the development and implementation of district heating – and cooling networks in Flanders.



BESIX Unitec developed recently a new technique, the 'thermal prestressing' method for the installation of the transport pipes. This is a technique that involves preheating the pipes when they are laid and allows installation to be carried out flexibly, while guaranteeing quality, a reduced risk of leaks over the long term and which required less heavy pump installations to transport the heating/cooling water.

As also BESIX Infra is involved in the installation process of these networks this is a another perfect example of co-creation between 2 companies of BESIX Group.

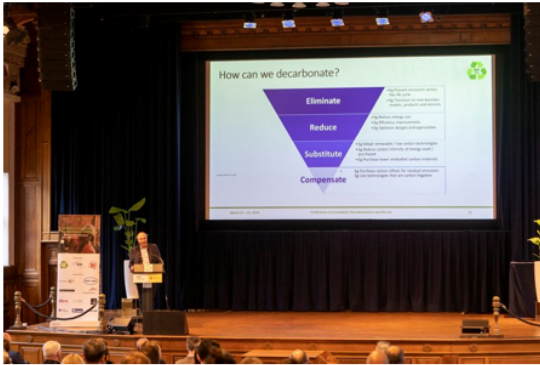
12.7. Belgian Hydrogen Council

In September 2022 TWEED (Wallonia) and WaterstofNet (Flanders) clusters have joined forces and established the Belgian Hydrogen Council. To facilitate the cooperation between the industry and the various governments on hydrogen, WaterstofNet and Cluster Tweed will work together intensively under the flag of a 'Belgian Hydrogen Council' which comprises Flemish members of WIC (Waterstof industrie Cluster) and French members of H2Hub. BESIX Environment is a member of the Belgian Hydrogen Council and aims to play an important role in this initiative.



12.8. Other

- Franki Foundations presented their carbon reduction program and challenges at the International Conference on Foundations Decarbonization and Re-Use. For this purpose Franki Foundations visualized its sustainability approach by the following video: [Sustainability approach Franki Foundations](#)



13. More information

More information can be found on:

- the dedicated CO2 webpage (<https://www.besix.com/en/about/co2performancescale>) on the BESIX website. This webpage is also accessible via the website of each company belonging to the Organizational Boundary.
- the SKAO website (<https://www.co2-prestatieladder.nl/nl/certificaathouders>)

In case of questions and/or suggestions, feel free to contact us on QHSE@besix.com