



CLIMATE & ENERGY

Supporting the world's transition to
a zero-carbon economy

November 2022



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INTRODUCTION

The effects of climate change are already plain to see. Limiting greenhouse gas (GHG) emissions is one of the biggest and most pressing challenges of our time. It is estimated that the mining sector as a whole is responsible for 4 to 7 percent of GHG emissions globally*, meaning that we all have a vital role to play in setting and achieving targeted reductions.

In August 2021, Sibelco announced an ambitious target to reduce Scope 1 and 2 emissions intensity (tonnes CO₂ / revenue) by 5% per year from 2021 to 2030 – cumulatively a reduction of 37%, assuming the same scope of activities. An engagement target for scope 3 emissions was announced in 2022 after detailed consultation with customers and suppliers.

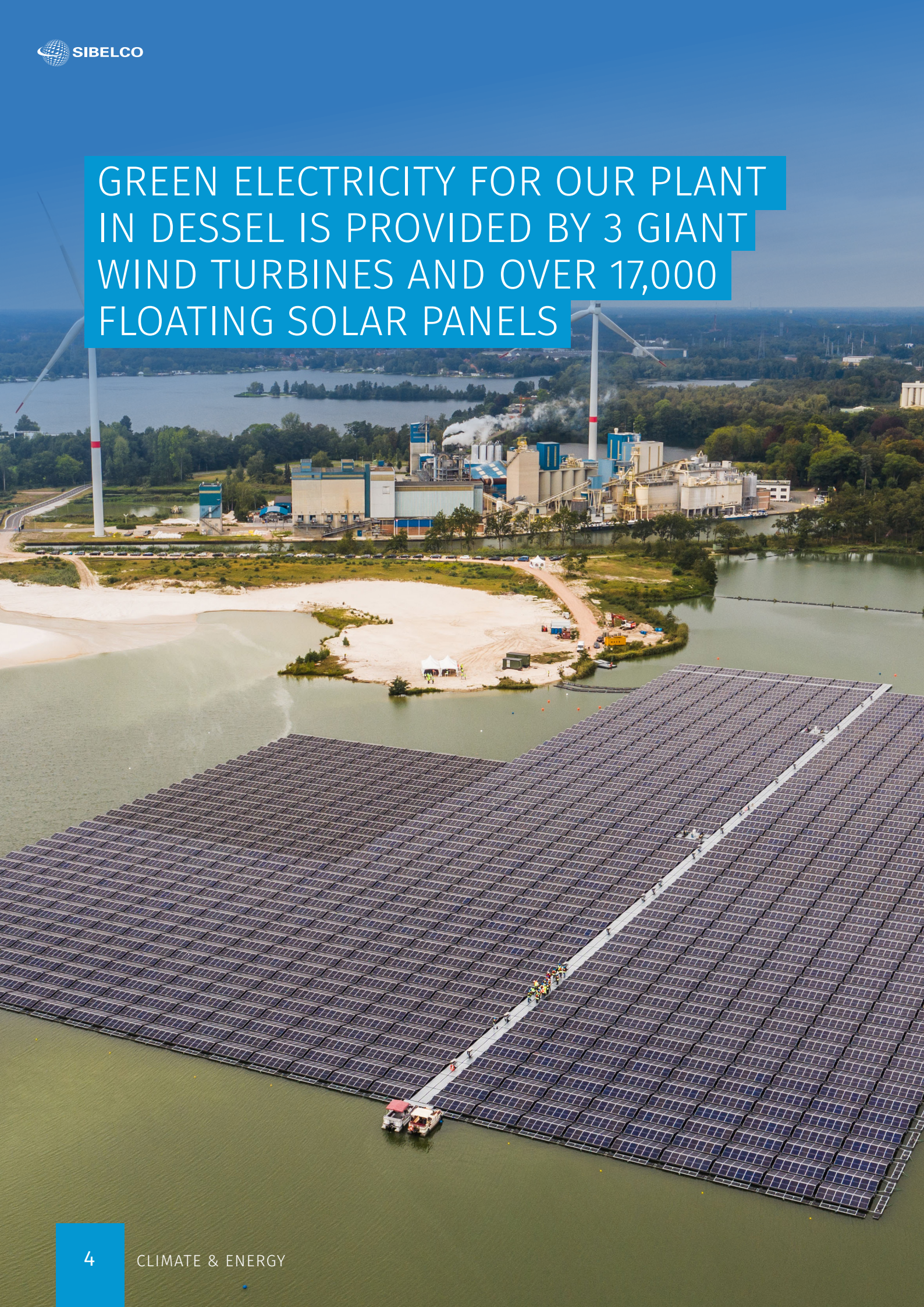
These targets are in line with best practices promoted by the Science Based Targets initiative (SBTi) and aligned with the Paris Agreement's goal to limit global warming to well below 2°C compared to pre-industrial levels.

Our 5% per year scope 1-2 intensity reduction target is one of the toughest set by any business in the industrial minerals sector to date. We will invest approximately €90 million in new technologies and operational excellence initiatives over the next nine years to help us achieve this goal.

Climate and energy forms part of Sibelco's overall sustainability framework, developed via a comprehensive materiality assessment which helped us to identify the environmental, social and governance issues most relevant to our business and stakeholders. You can find out more at: www.sibelco.com/sustainability

The world faces a clear and urgent climate challenge. The solutions are complex, but we can all play our part. This report outlines Sibelco's approach to energy and GHG emissions reduction, demonstrating our resolute commitment to contribute to a zero-carbon economy.

GREEN ELECTRICITY FOR OUR PLANT IN DESSEL IS PROVIDED BY 3 GIANT WIND TURBINES AND OVER 17,000 FLOATING SOLAR PANELS



OUR TARGETS

Following in-depth research and analysis with the support of external energy experts, we have established a set of clear and ambitious GHG reduction targets.

These targets are in line with best practices promoted by the Science Based Targets initiative (SBTi) and aligned with the Paris Agreement’s goal to limit global warming to well below 2°C compared to pre-industrial levels. The Science Based Target initiative approved Sibelco’s near term targets:

SCOPE 1 & 2 EMISSIONS

We commit to reduce scope 1 and 2 GHG emissions **5%** year on year per euro revenue (tonnes CO₂ / ex-works revenue), equivalent to a **22.5%** absolute reduction, by 2030 from a 2021 base year.

The target boundary includes biogenic emissions and removals from bioenergy feedstocks.

The intensity target leads cumulatively to a reduction of 37% of absolute emissions assuming the same scope of activities

We will invest approximately **€90 million** in new technologies and operational excellence initiatives over the next nine years to help us to achieve this goal.

SCOPE 3 EMISSIONS

We commit that **68.9%** of our suppliers and customers by emissions, covering **37%** of upstream transportation and distribution emissions and **85%** of processing of sold products emissions, will have science-based targets by 2026.

Our CO₂ framework (targets and KPIs) was assessed by Sustainalytics in a second party opinion in June 2022.

OUR APPROACH

PLANNING

To ensure our targets are achieved, we have a CO₂ reduction strategy focused on scope 1,2 & 3 emissions.

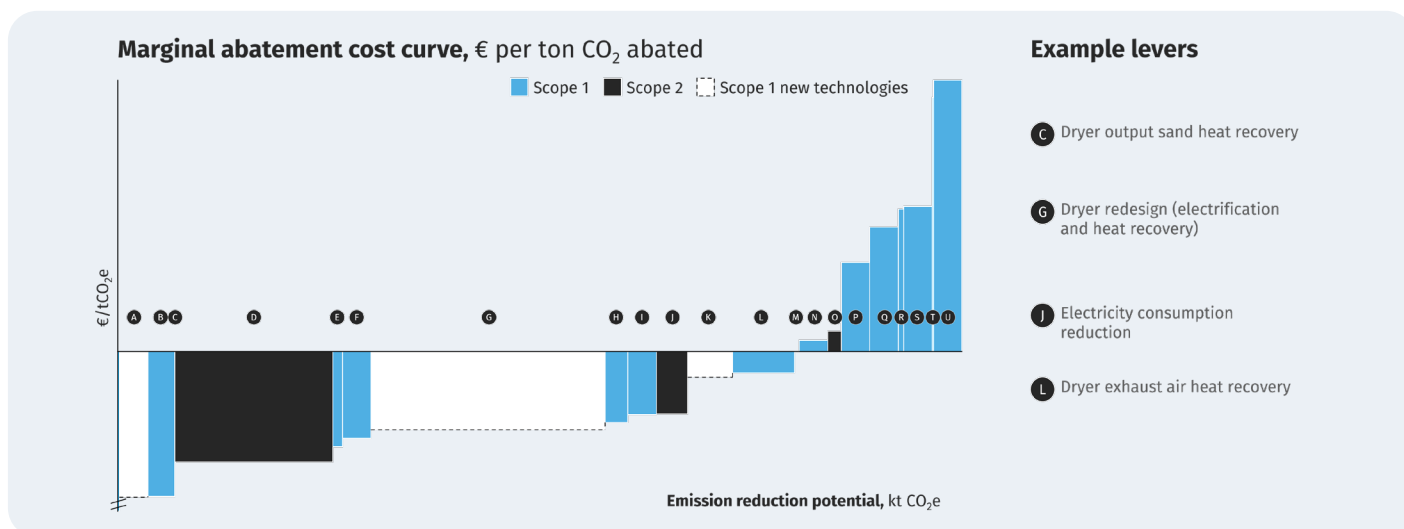
For scope 1&2 we have set up a time-bound action plan which centres around decarbonisation programmes to tackle the main sources of emissions across our business.

Resulting actions and projects are identified, prioritised and resourced appropriately. Actions can be short, medium and

long-term (up to 2030) and the programmes include the piloting of new low-carbon technologies.

We use the marginal cost abatement curve to evaluate different CO₂ reduction initiatives at global and local level.

For scope 3 we have developed an engagement strategy that will be rolled out by our commercial teams as from Q4 2022.



GOVERNANCE

We have installed a core CO₂ team and steering committee dedicated to GHG emissions reduction, made up of representatives from all key business functions.

The CO₂ Steering Committee:

- sets the direction for our decarbonisation strategy (targets, KPIs, internal carbon price, partnerships with customers etc.)
- approves and validates initiatives and projects of the CO₂ Core Team
- approve CO₂ budgets - Sibelco will invest €90 million in new technologies and operational excellence initiatives over the next nine years to help us achieve our GHG targets

The CO₂ Core Team:

- pro-actively manages the decarbonisation strategy with decarbonisation programmes implemented under the coordination of dedicated programme managers
- ensures consistent and accurate reporting of CO₂ emissions of sites and global reporting dashboards
- develops guidelines, work instructions and procedures for site management
- performs top-down analyses and test bottom-up CO₂ reduction initiatives
- provides accurate footprint calculations
- ensures correct application of internal carbon pricing
- ensure verification of the CO₂ strategy (limited/ reasonable assurance reports)

RENUNERATION

The Sibelco senior management team's annual bonus structure is linked to progress towards GHG reduction targets, whilst a new internal carbon fee is linked to the bonus scheme of our operational teams.

EMPLOYEE TRAINING

All of our people can play an active role supporting our drive for energy efficiency. As well as communication to raise awareness and encourage participation, we provide:

- basic climate change training for all relevant business functions
- sharing of energy saving best practices across the whole community
- distribution of the Sibelco Energy Handbook to help increase the energy efficiency of installed equipment

AUDITING

Energy audits are performed internally as part of ISO 50001:2018 requirements. Internal experts led by the Center of Excellence for Energy conduct yearly assessments to monitor the progress of energy management at all major Sibelco sites and define the area of interventions..

Our CO₂ framework (targets & KPIs) was validated by Sustainability in a Second Party Opinion. We performed a readiness check on our CO₂ performance and plan for limited assurance in 2023.

OUR DECARBONISATION PROGRAMMES

GLOBAL PROGRAMS

To ensure that we achieve our decarbonisation goals, we have identified three priority programmes which focus on Sibelco's biggest sources of CO₂ emissions:

- Dryer Decarbonisation: including efficiency improvement, waste heat recovery, advanced automation, fuel switch, redesign, and exploration of new technologies.
- Calciner Decarbonisation: including efficiency improvement, heat recovery, redesign and new technologies.
- Scope 2 Reduction: including renewables, green energy purchased and virtual PPAs (Power Purchase Agreements)

All three programmes are centrally managed and locally implemented with the support of our skilled engineering, optimisation and technology & innovation teams. To support our decarbonisation, we will invest approximately €10 million per year in new technologies and operational excellence initiatives.

OPERATIONAL EXCELLENCE & ENERGY EFFICIENCY

Energy efficiency is a key pillar of our global Operations Optimisation programme, which has become part of our way of working and is now central to continuous improvement.

The core elements of the programme are:

- productivity enhancement
- energy efficiency
- yield improvement
- value driven maintenance
- quality assurance

Each workstream is centrally led by a dedicated Centre of Excellence, working in partnership with our local Change Agents. Lean methodology (with a special focus on performance dialogue and problem-solving tools) is commonly applied and embedded across our operations.

This approach has supported a continuous reduction in energy consumed by our processes, monitored through the Production Energy Efficiency Report (PEER). Local energy and production data is fed into PEER each month, automatically highlighting energy consumption and efficiency per site / work centre / product. This forms the basis for monthly CO₂ Scope 1 and 2 internal reporting.

RENEWABLE ENERGY

In 2021 Sibelco covered 4.3% of its electricity demand from renewable energy sources including wind turbines, solar panels (roof mounted, ground mounted, floating) and gravitational energy recovery systems.

We expect to increase the amount of electricity covered by renewables in 2022 thanks to new solar parks at Sibelco operations in Portugal, Italy, Spain and Germany. Further renewable installation projects are in the pipeline for 2023-24.

As well renewable energy projects at our sites, we implemented a strategy for green energy certificates from 2022-24. This allows additional time needed to set up a longer-term solution via virtual PPAs.

FUEL SWITCHING

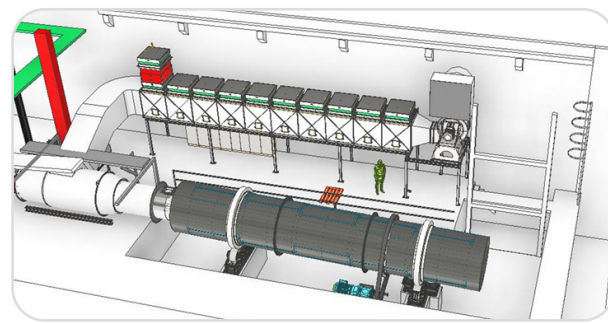
Part of our CO₂ reduction strategy focuses on thermal processes in our dryers and calciners, for which we are exploring new technologies. In 2022 we switched all of our operations to gas, eliminating coal completely.

We are investing in multiple fuel switch projects, including the electrification of a diesel fuelled dryer in Norway, a

diesel-to-LPG dryer in the UK, a diesel-to-gas boiler in the US, and an LPG-to-biomass project in Brazil.

We aim to progressively replace diesel-powered mobile work equipment with electric versions. At one of our sites in the Netherlands, all forklift trucks are now fully electric. Along with our suppliers, we are looking at ways to make heavy mining plant more environmentally friendly.

Within a few years one of our mines in Germany will be fully electrified with electric mobile equipment and conveyor belts.



Hybrid dryer in Stjerneoy, Norway

A COMPREHENSIVE DECARBONISATION ATTITUDE

WORKING WITH OUR CUSTOMERS

We are partnering with some of our biggest customers to help reduce energy demand in the glassmaking process. Our technical experts are developing and trialling new batch materials and technologies to help save energy during the melting, forming and annealing phases of the glass manufacturing process.

To guarantee that our customers benefit from real data, CO₂ emissions by product family are being

measured following the LCA approach including the life cycle stages (A1: raw material, A2: transport, A3: manufacturing).

PROCUREMENT

As part of our scope 3 target, we engage with suppliers to reduce GHG emissions, including third-party transport suppliers (a significant percentage of our emissions total). We consider a company's GHG emissions and reduction efforts when selecting suppliers.

CARBON SEQUESTRATION THROUGH LAND RESTORATION

As a minerals company, we also include land use in our carbon strategy. Sibelco owns over 15,00 hectares of land and leases a further 3,000. Hence, we have developed a methodology to evaluate land use changes in relation to CO₂.

In Belgium, we have initiated a pilot research project to evaluate the use of 2,235 hectares of land in Dessel, Mol and Lommel. The study is evaluating land use over several timeframes (2025, 2030, 2040 and 2050) and assessing the impact of different rehabilitation scenarios, for example wetland creation. In the Flanders region, a hectare of wetland can capture up to 4.5 tonnes of carbon per year.

Initial results show that Sibelco can make a positive impact with smart restoration / closure planning and through pro-active management before, during and after operations. Once the pilot exercise is completed and a methodology formulated, we plan to roll this out across Sibelco and calculate the land use impact and potential of our activities in all countries.

EMPLOYEE TRANSPORT

Remote / hybrid working is supported where practical, allowing many non-operational employees to reduce commuting-related emissions.

We promote sustainable transport for our employees via local car policies. For example, in Belgium we offer a mobility package to qualifying employees, allowing them to combine a company car with public transport. All new company cars must be hybrid or electric.

OUR PILOT STUDY IN BELGIUM IS ASSESSING THE IMPACT OF DIFFERENT MINE REHABILITATION SCENARIOS, FOR EXAMPLE WETLAND CREATION FOR CARBON CAPTURE



KPIS, MONITORING & REPORTING

Key Performance Indicators

Scope 1 and 2			
Absolute Emissions		Baseline 2021	FY2021
Total Scope 1 GHG Emissions	tons of CO ₂ equivalent (tCO ₂ eq)	362,661	362,661
Total Scope 2* GHG Emissions (market-based)	tons of CO ₂ equivalent (tCO ₂ eq)	163,322	163,322
Total Scope 2* GHG Emissions (location-based)	tons of CO ₂ equivalent (tCO ₂ eq)	163,322	163,322
Energy Consumption		Baseline 2021	FY2021
Total Energy Consumption	MWh	2,302,015	2,302,015
Total Renewable Energy** Consumption	MWh	25,730	25,730
Total Biomass Energy Consumption	MWh	226,552	226,552
Financial Intensity KPI		Baseline 2021	FY2021
CO ₂ Financial Intensity Scope 1&2	kg CO ₂ eq/€ ex-works revenue	0.40	0.40

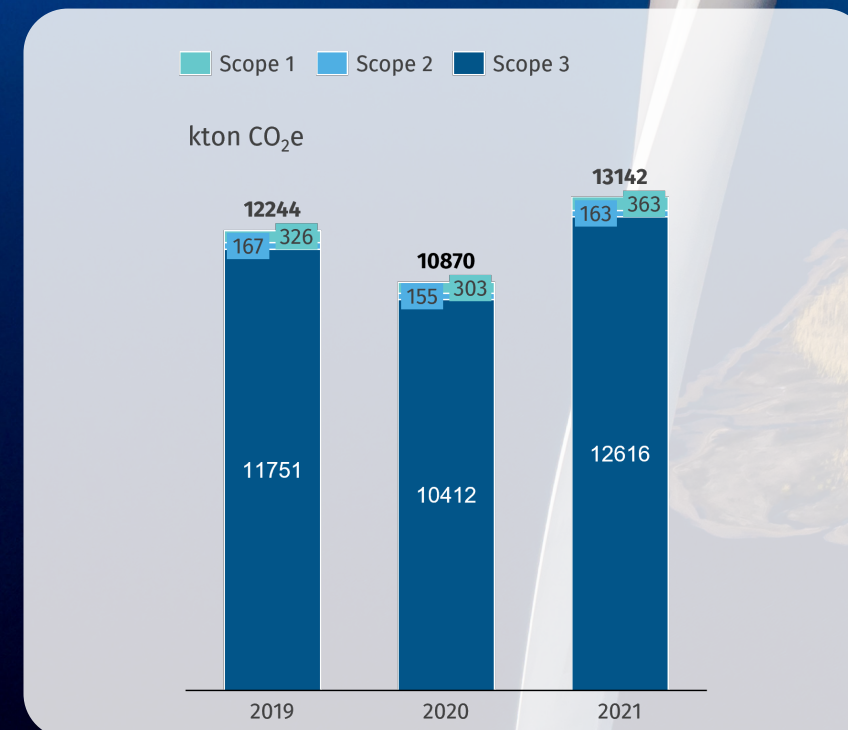
Scope 3			
Absolute Emissions		Baseline 2021	FY2021
Total Gross Scope 3 GHG Emissions	tons of CO ₂ equivalent (tCO ₂ eq)	12,615,714	12,615,714
Total Gross Scope 3 Upstream GHG Emissions	tons of CO ₂ equivalent (tCO ₂ eq)	1,965,710	1,965,710
Total gross Scope 3 Downstream GHG Emissions	tons of CO ₂ equivalent (tCO ₂ eq)	10,650,004	10,650,004
Engagement KPI		Baseline 2021	FY2021
Percentage of customers and logistic suppliers, by emissions, committing to SBTi	%	16%	16%

*Market-based approach shows here the same value as Location-based because we started with the lowest precision level of the data hierarchy allowed by the Protocol. We are working to obtain real emission factors from our suppliers to refine the calculation.

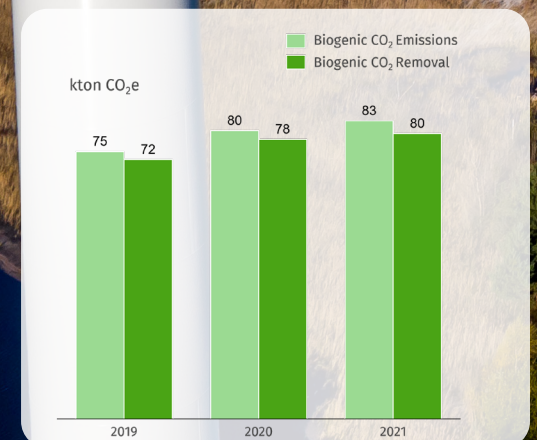
**includes self consumption from wind turbines, solar panels (roof mounted, ground mounted, floating) and gravitational energy recovery systems.



Corporate Carbon Footprint



Outside of Scopes Emissions and Removals



CALCULATION METHODOLOGY

GHG emissions were calculated following GHG Protocol with the support of an external partner experienced in climate change topics. The framework has been checked by a revisor.

SCOPE 1

DEFRA emission factors applied to yearly consumption data. Other emissions such as explosives, refrigerants leaks & direct emissions gathered from sites.

SCOPE 2

Emission Factors according to the highest hierarchy precision level available applied to yearly energy consumption data. Emissions are reported both on location-based and on market-based, following the GHG Protocol Scope 2 Guidance (https://ghgprotocol.org/scope_2_guidance)

SCOPE 3

Purchased goods and services: purchase of raw material is accounted considering volumes, location and transportation means by EcoInvent and DEFRA emission factors; other purchased goods and services are calculated using financial inputs and Exiobase emissions factors.

Capital goods: capital expenditures including mobile and non-mobile equipment by Exiobase emission factors.

Fuel and energy-related activities: energy consumption reported for Scope 1 and 2 by DEFRA and IEA emission factors to account for upstream emissions of purchased fuel and power and T&D losses.

Upstream transportation: distance-based calculations considering the different typology of means of transportation (e.g. truck, train, vessel) by DEFRA WtW (Well-to-Wheel) emission factors (kgCO₂e/tkm).

Waste generated in operations: weight of annual waste produced by our operations split into main hazardous and non-hazardous categories by DEFRA emission factors.

Business travel: spend base by country by Exiobase emission factors.

Employee commuting: pilot study applied to the whole company with distance-based and means of commuting by DEFRA emission factors.

Downstream transportation: distance-based calculations considering the different typology of means of transportation (e.g. truck, train, vessel) by DEFRA WtW (Well-to-Wheel) emission factors kgCO₂e/tkm).

Processing of sold products: volume-based calculation with detailed investigation per main market applications based on bill of material to define the share of emissions and emission factors derived from EcoInvent database (including only Scope 1 and 2 of customers).

Sold products end-of-life treatment: volume-based calculation based on expected EoL treatment based on main market applications by DEFRA emission factors.

OUTSIDE OF SCOPES

Out of scopes: biogenic CO₂ emissions related to the combustion of biomass and biofuel by DEFRA emission factors. Removal is also reported.

We have an annual base year recalculation policy in place to guarantee transparent like-per-like comparison and to account for:

- **structural changes, including any mergers, acquisitions and divestments; outsourcing and insourcing of emitting activities; changes in calculation methodology or improvements in the accuracy of emission factors or data**
- **discovery of significant errors, or several cumulative errors that are collectively significant**

MONITORING

We have a GHG monitoring inventory in place to collect emissions data in accordance with GHG protocol. Primary raw data is used as the preferred source for CO₂ calculations, externally verified by financial auditors. We update our inventory at least once per year with scope 1 & 2 emissions calculated monthly and our total footprint updated yearly.

Relevant GHG emissions are monitored for our entire scope. We have applied operational boundaries to our inventory, meaning that all Sibelco's subsidiaries over which we have operational control are included.

We use industry-average data to estimate our scope 3 emissions, applying emission factors from databases to quantities (e.g. volumes, distances) or to financial figures. We collect primary scope 3 data from internal stakeholders, such as waste produced by our sites.

Our latest review showed that we are currently in line with our targets.

REPORTING

We share our GHG emissions data internally with all employees, and externally via this report and as part of our Annual Report.

SUSTAINABLE PRODUCTS

Our minerals are used to create solutions that tackle climate change, such as solar panels, wind turbines and building insulation materials. And as we shift towards a circular economy, we are finding new ways to introduce more secondary materials to our portfolio.

Sibelco is already Europe's leading glass recycler. Every year we transform over 3 million tonnes of waste glass into high-quality cullet which is used to make brand new glass and other products. This ensures that less glass waste goes to landfill, whilst reducing the amount of primary raw materials needed to make new glass. It takes considerably less energy to melt recycled glass (cullet) than it takes to melt raw materials – every 1,000 tonnes of cullet used during the glass manufacturing process saves approximately 314 tonnes of CO₂.

Other examples of secondary raw material solutions include a new process (developed at our Maastricht site) which recycles waste generated from fibreglass manufacturing. The recycled material is returned to our customers to replace primary raw materials in the production of new fibreglass, resulting in a 30% reduction in CO₂ emissions.

Sibelco is also a partner in Act&Sorb, the first company to have developed a sustainable and value-adding process for recycling wood residues such as MDF. Using a carbonisation and activation technology, wood residue is converted into high value activated carbon - an essential product used to purify water and to clean air.

Our goal is to increase the percentage of company revenue generated from products supporting the circular economy to at least 20% by 2030.

We are currently exploring the use of olivine as a negative emissions technology with three projects underway. The first is assessing the potential of olivine to remove atmospheric CO₂ and to counteract ocean acidification through enhanced silicate weathering. A second project is looking at the transformation of CO₂ into valuable products via mineral carbonation, whilst the third project is experimenting with production of magnesium hydroxide from olivine.

EVERY YEAR WE TRANSFORM OVER 3 MILLION TONNES OF WASTE GLASS INTO HIGH-QUALITY CULLET WHICH IS USED TO MAKE BRAND NEW GLASS AND OTHER PRODUCTS

