



ENVIRONMENTAL, SOCIAL AND GOVERNANCE

How we proactively manage the impact of
our operations and products



SIBELCO



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INTRODUCTION

AS A GLOBAL INDUSTRIAL MINERALS BUSINESS, SIBELCO'S ACTIVITIES CAN HAVE BOTH POSITIVE AND NEGATIVE IMPACTS ON THE ENVIRONMENT AND SOCIETY.

It is essential that we proactively manage these impacts in line with the changing expectations of stakeholders and increasingly stringent legislation. Our ability to do this will ultimately determine our licence to operate and Sibelco's long-term future.

Sustainability has always been central to our day-to-day operations at a local level. In recent years we have developed a global framework within which all of our sites now operate. This is helping us to create a uniform approach with consistent standards across the business and the sharing of best practices between sites.

Our approach is continuously evolving. Sustainability involves multiple, interconnected elements with trade-offs sometimes needed in order to balance environmental, societal and economic needs. We are making good progress on our journey to leadership in sustainability.

The first part of this document outlines our sustainability framework, covering all ESG elements. We then look in more detail at sustainable operations - how we practically manage the day to day and longer term environmental, social and governance impacts of our sites. We also look at sustainable products - how we are working to measure and control the footprint of our products across their lifecycles.

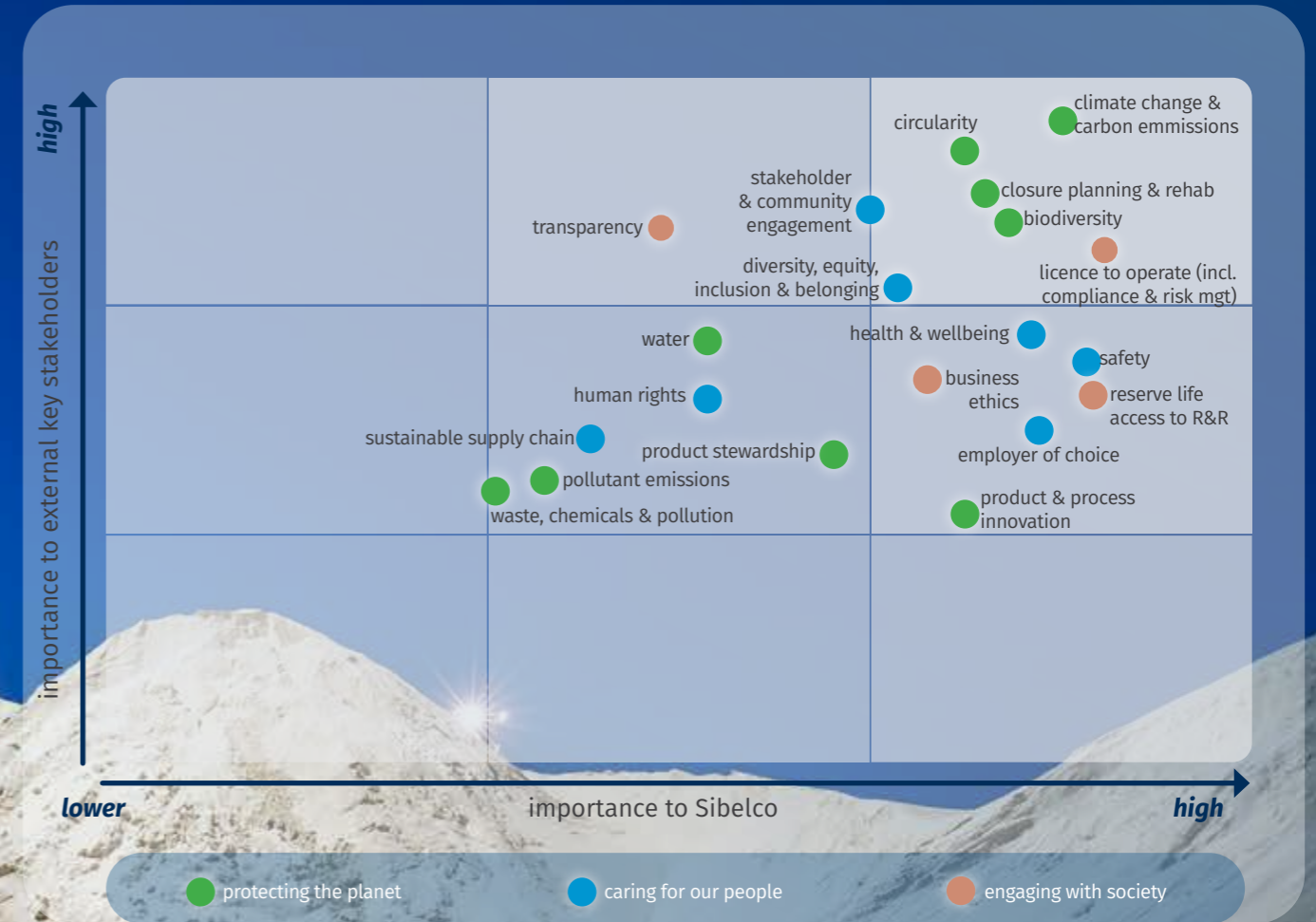
The second half of the document shows how our global approach is implemented at a local level with a close-up look at our Winterswijk site in the Netherlands.

Please refer to Sibelco's Activity Reports for further information about our wider sustainability approach and performance.



OUR SUSTAINABILITY FRAMEWORK & PRIORITIES

SIBELCO OPERATES IN A COMPLEX ENVIRONMENT ACROSS MULTIPLE MARKETS AND GEOGRAPHIES. OUR SUSTAINABILITY PRIORITIES WERE DEFINED THROUGH A COMPREHENSIVE 14-MONTH MATERIALITY ASSESSMENT (UPDATED IN 2022) WHICH HELPED US TO IDENTIFY AND UNDERSTAND THE ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) ISSUES MOST RELEVANT TO SIBELCO AND OUR KEY STAKEHOLDERS.



1: Research & Benchmarking

We identified key ESG factors relating to Sibelco and benchmarked ourselves against industry peers, customers and other businesses regarded as leaders in sustainability. This included an in-depth review of multiple companies' sustainability reports and an assessment of how Sibelco can best contribute to the United Nations' Sustainable Developments Goals.

2: Impact Mapping

ESG areas presenting the biggest risks and opportunities for Sibelco were highlighted and a draft list of relevant sustainability categories was drawn up.

3: Stakeholder Engagement

The insights gained were then used as a basis upon which to conduct interviews with Sibelco employees, shareholders, board members, customers, local communities, representatives of unions, NGOs, banks and insurance companies. The interviews helped us to build a deeper understanding of sustainability priorities in relation to different parts of our business including market trends, customer expectations, a changing recruitment landscape and challenges relating to our licence to operate.

4: Analysis & Evaluation

All information was evaluated and quantified in order to create the framework of Sibelco's materiality matrix (overleaf) with provisional goals, KPIs, strategies and partnerships identified.

5: Validation

Discussions were held with our Executive Committee and with our board level Sustainability Committee to determine Sibelco's level of ambition and agree our sustainability

priorities with associated goals and KPIs. Our final priorities and targets were validated by the Board of Directors in September 2022.

6: Integration

Sibelco's priorities and targets are widely communicated to our people. A board level Sustainability Committee was created at the start of 2022. This Committee, together with a management level ESG Committee, steers the implementation of our sustainability strategy.

OUR SUSTAINABILITY FRAMEWORK & PRIORITIES

FROM THE MATERIALITY ASSESSMENT WE DEVELOPED OUR ESG MODEL WITH ASSOCIATED PRIORITIES, BUILT AROUND 3 CORE ELEMENTS: PROTECTING THE PLANET, CARING FOR OUR PEOPLE AND ENGAGING WITH SOCIETY.



SUPPORTING THE UN SUSTAINABLE DEVELOPMENT GOALS

THE UNITED NATIONS' SUSTAINABLE DEVELOPMENT GOALS (SDGs) FORM A UNIVERSAL BLUEPRINT FOR ACHIEVING A BETTER AND MORE SUSTAINABLE FUTURE FOR ALL BY 2030.

Sibelco's sustainability strategy is built around our purpose "material solutions, advancing life" and contributes to eleven of the seventeen SDGs:



PROTECTING THE PLANET

<p>Circularity</p>	<p>Material solutions such as cullet (recycled glass) help our customers to save energy, whilst cutting landfill waste and reducing society's dependence on primary raw materials</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> increase percentage of company revenue in circular business (glass recycling, filter sand, foundry sand, MDF etc.) to at least 20% by 2030
<p>Climate Change & Carbon Emissions</p>	<p>In line with best practices promoted by the Science Based Targets initiative (SBTi) we are supporting the world's transition to a zero-carbon economy by substantially reducing emissions generated by our own operations whilst partnering with our customers to help them do the same</p> <p>We identified abatement levers and will invest an additional €90m in capex from 2021 to 2030</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> reduce scope 1 and 2 GHG emissions intensity by 5% each year (kgCO₂e/EUR ex-works revenue) until 2030, from a 2021 baseline, cumulatively a reduction of 37% assuming the same scope of activities increase percentage of scope 3 emissions covered by customers and logistic suppliers committed to SBTi to 67% by 2026
<p>Closure Planning & Biodiversity</p>	<p>By carefully planning quarry restoration schemes before mining even begins, we create vital new habitats for wildlife, important agricultural land, and valuable green spaces and recreational facilities for local communities</p> <p>When managed properly, both active and restored quarries provide unique havens for a diverse range of flora and fauna, thereby contributing to healthy ecosystems. We ensure that our activities support biodiversity and always leave a positive legacy</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> decrease percentage of disturbed land of the total managed land; establish baseline by the end of 2022 and determine target 100% of sites with a direct or indirect impact on biodiversity and ecosystems have a biodiversity management plan in place restore active quarries and mines with added value for biodiversity and ecosystems; establish the current status by the end of 2024 and measure going forward

CARING FOR OUR PEOPLE

<p>Diversity, Inclusion & Belonging</p>	<p>By creating a diverse and inclusive culture in which everyone feels welcome, we inspire and empower our people to make a positive difference in the workplace and beyond</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> achieve a minimum of 40% female representation
<p>Employer of choice</p>	<p>We aim for an engaging workplace and growth opportunities for our people through a performance-oriented culture. We make our employees partners in their own professional development. We promote internal mobility and collectively celebrate individual and team successes</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> improve employee engagement score year over year
<p>Health & Safety</p>	<p>We are committed to achieving zero fatalities, working together to ensure that everyone returns home safely after each working day – no job is so important that it cannot be done safely</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> zero fatalities reduce Recordable Incident Rate (RIR) to < 1.5 (# of recordable injuries per million hours worked)
<p>Human Rights</p>	<p>We are committed to the protection and promotion of human rights, treating all people involved in or affected by our operations and value chain around the world with dignity and respect at all times</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> 100% of the workforce trained on the Code of Conduct and the Supplier Code of Conduct

ENGAGING WITH SOCIETY

<p>Business Ethics</p>	<p>Guided by a strong set of moral principles and values, we make ethical decisions, manage risk and conduct our business in full compliance with all legal and regulatory requirements, in a way that achieves an optimal balance between environmental, societal and economic needs</p> <p>We will develop a targeted strategy to formalise and support our current business ethics approach</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> train employees annually on anti-corruption and competition law compliance develop a country risk assessment report for all new country entries approve and report on all gifts and donations 100% of suppliers and partners assessed and monitored on ESG criteria
<p>Community & Stakeholder Engagement</p>	<p>Continuous two-way dialogue with local communities and stakeholders supports positive relationships and creates mutually beneficial outcomes, ensuring that we earn and maintain our social licence to operate</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> 100% of sites with a community & stakeholder engagement plan in place report on community investments yoy
<p>Corporate Governance</p>	<p>Our business is governed at all times by a robust set of rules, practices and processes at Board and management level which are fully aligned with our purpose, values and strategy, thereby providing a framework for consistent decision making. Our sustainability reporting is in line with required standards</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> build an integrated ESG management oversight to ensure strong accountability ensure integrated reporting in line with CSRD, standards and assurance requirements
<p>License to Operate</p>	<p>We adopt a 'whole of life approach' to strategic permitting with a methodology covering the entire lifespan of the operation – before, during and after mining; To maintain our licence to operate, we continuously manage risk and proactively manage the impacts of our operations, not only in compliance with legislative requirements but also in tune with the high expectations of our stakeholders</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> pro-actively identify risks and opportunities to minimise ESG impacts while building strong relations with key stakeholders
<p>Reserve Life</p>	<p>We identify high quality mineral deposits and proactively work with all key stakeholders to access mineral resources; robust feasibility studies ensure mine plans that allow us to extract sustainably, limiting our footprint with progressive rehabilitation towards a supported post-closure vision or rehabilitation plan; we are focused on resource efficiency with high-quality minerals for high-quality applications. This prolongs the life of our assets/deposits and balances the linear with circular economy to provide customers with a long-term and stable supply of high-quality material solutions</p>	<p>Our 2030 Goals:</p> <ul style="list-style-type: none"> reserve and resources in 2030 to be larger than 2021 in absolute tons

GLOBAL FRAMEWORKS

Sibelco was recognised as a responsible mining company by the United Nations Environment Programme in 2019, and actively contributed to the 2022 report Sand and Sustainability: 10 strategic recommendations to avert a crisis.

TO PROVIDE FURTHER STRUCTURE TO OUR APPROACH TOWARDS LEADERSHIP IN SUSTAINABILITY, WE WORK WITHIN SEVERAL GLOBAL FRAMEWORKS.

Ecovadis and Sustainalytics: ratings platforms to assess sustainability in all its dimensions. Sustainalytics also performed a Second Party Opinion on our CO₂ framework.

UN Global Compact: encourages businesses to adopt and report on sustainable and socially responsible policies.

SBTi: defines and promotes best practice in science-based target setting to align with the Climate Paris Agreement, assessing the impact of the company on climate.

ISO: many Sibelco sites worldwide are ISO-certified.

OUR VALUES

-  INTEGRITY
-  RESPECT
-  OWNERSHIP
-  EXCELLENCE
-  TEAMWORK



FROM COMPLIANCE TO LEADERSHIP

WE ENGAGE WITH OUR PEOPLE AND WITH SOCIETY SUSTAINABLY AND RESPONSIBLY.

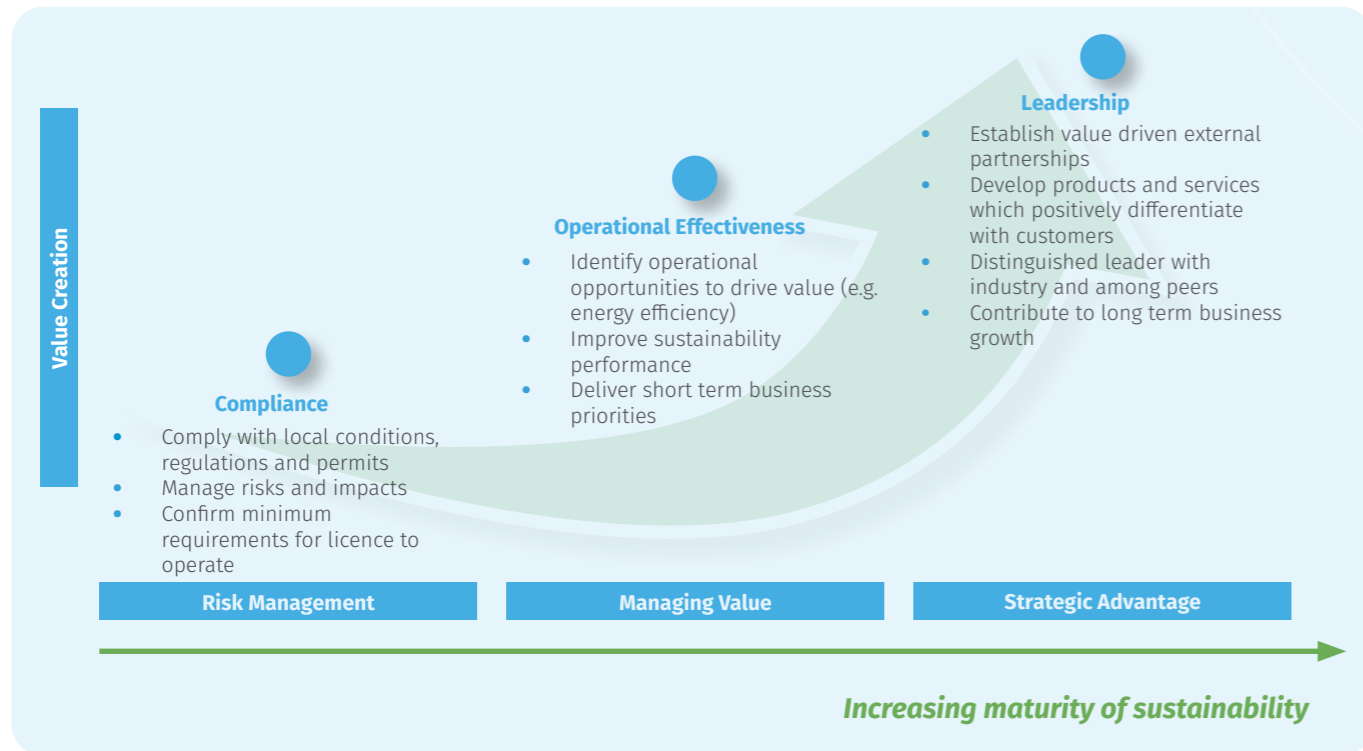
Integrity and ethics are critical to us, both in the workplace and in the way in which we do business.

Our Code of Conduct is the foundation of everything we do. The associated governance structure is focused on managing legal risks and ensuring compliance.

Guided by a strong set of principles and values we interact with our people and our stakeholders (suppliers, customers, communities, authorities, NGOs, etc).

Going forward we will continuously improve our way of working. We have set specific goals on business ethics, human rights and corporate governance and we are committed to applying the same standards in our value chain.

WE CONTINUOUSLY EVALUATE SIBELCO'S POSITION ON THE PATH FROM COMPLIANCE TO LEADERSHIP IN SUSTAINABILITY.



Our position on the curve varies between the different elements of sustainability. For example, some of our sites lead in terms of biodiversity and habitat creation, whilst others lead on emissions management. These leading sites are known as reference sites, acting as examples for other sites with best practices shared across the business.

We measure each site's current sustainability performance against targets via a map of excellence whilst at the same time pro-actively monitoring future risks to ensure that we take appropriate action.

Areas for improvement are identified and action plans put in place to ensure compliance with local legislation and Sibelco standards.

2030 GOALS

- 100% of the workforce trained on the Code of Conduct and the Supplier Code of Conduct
- train employees annually on anti-corruption and competition law compliance
- develop a country risk assessment report for all new country entries
- approve and report on all gifts and donations
- 100% of suppliers and partners assessed and monitored on ESG criteria
- build an integrated ESG management oversight to ensure strong accountability
- ensure integrated reporting in line with CSRD, standards and assurance requirements



Our Team

We have an experienced team dedicated to the continuous development and implementation of our global sustainability approach. This team works hand in hand with our local sustainability managers who execute the Sibelco model and manage sustainability at national and cluster level.

Whilst we have a dedicated sustainability team, sustainability is about collaboration across all functions and involves people throughout the organisation.

SUSTAINABLE OPERATIONS

TO MANAGE THE ENVIRONMENTAL AND SOCIAL IMPACTS OF EACH OF OUR SITES, WE ADOPT A UNIFORM WAY OF WORKING ACROSS KEY MANAGEMENT AREAS:



We look at each of these management areas in more detail on the following pages.



STRATEGIC PERMITTING

Context

As soon as our geologists have identified high quality mineral deposits, the process of obtaining mining permits begins. This is a complex procedure with national and local regulations continuously changing. On average it takes between 10 - 15 years to secure access to a new mineral deposit.

Permit applications to local authorities must include detailed mining plans and full environmental impact assessments and, in some cases, also the plan for end of life / our legacy after operations.

Approach

We adopt a whole life approach to strategic permitting with a methodology covering the entire lifespan of the operation – before, during and after operations.

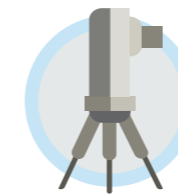
The securing of permits is managed by our local teams with the sustainability manager, cluster manager, geologist and country manager working closely together throughout the process.

We have set a target for our reserves and resources in 2030 to be larger than in 2021 in absolute tons.

Monitoring

We monitor the number and duration of permits per site as well as the number of permit applications in progress across the business.

We have developed risk registers for all sites that are focused on environmental and social elements. We implement actions to mitigate any actual or potential risks and we closely monitor these via our List of Projects on Sustainability.



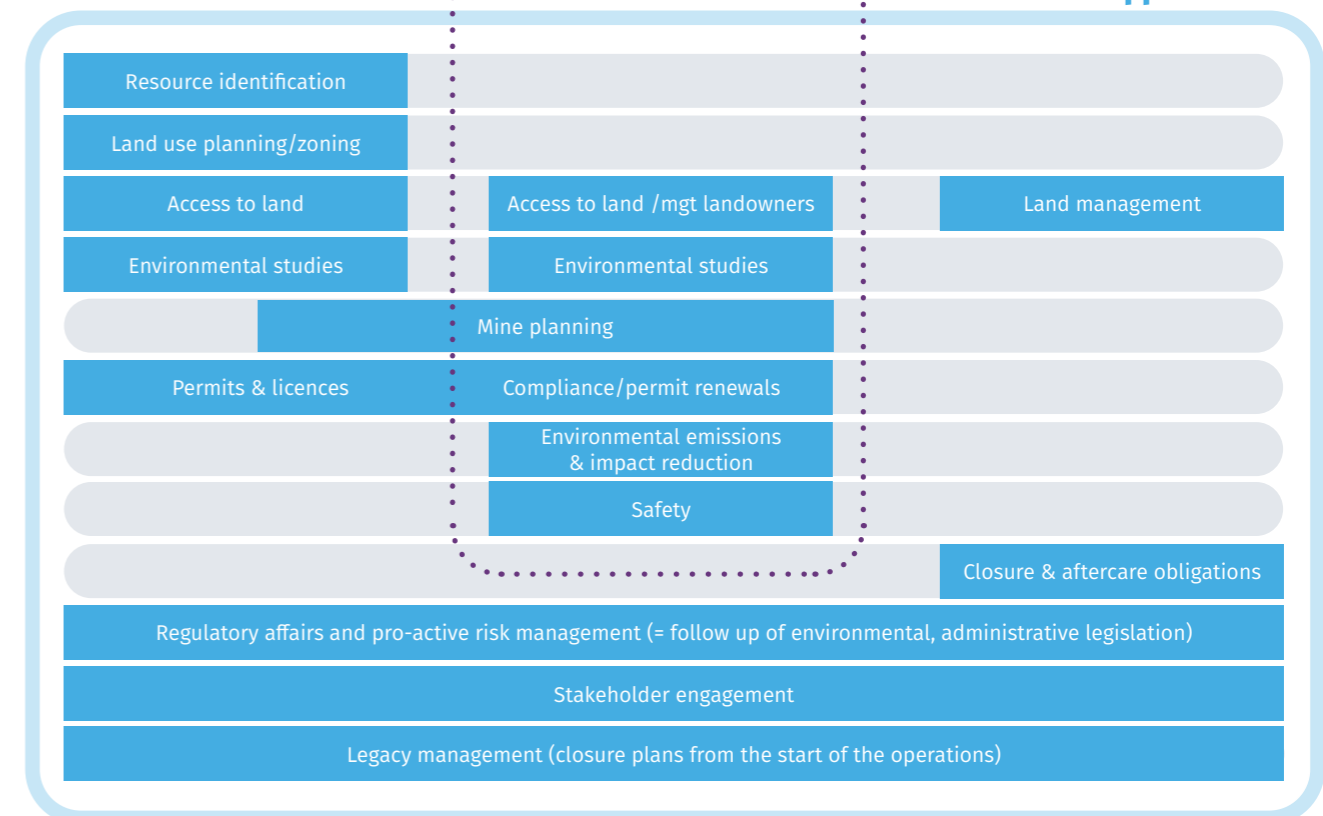
Before Operations



During Operations



When active operations are stopped



LAND & LEGACY MANAGEMENT

Context

Proactive land management is a key success factor in the mineral industry. A strong portfolio of land together with good relations with landowners and land users ensures long-term continuity of operations.

Approach

The process to approve the acquisition, leasing and disposal of land is consistent across the business, thereby ensuring all land transactions fit within Sibelco's global strategy.

Our local sustainability and cluster teams manage our landholdings and relationships with landowners. Our land portfolio is mapped and monitored via our Geographical Information System (GIS) which provides us with local data and a global overview.

Following the introduction of a global approach to closure planning in 2015, closure plans are today in place for all Sibelco sites. The objectives of the plans are to provide:

- accurate provisions for site restoration and plant demolition
- long-term sustainability to ensure a positive legacy (an enabler to get access to new mining areas and ensure our licence to operate)

Our approach to closure planning is amongst the most advanced in the minerals industry. We adhere to a 'constructive obligation', meaning we look beyond what is legally required and consider all stakeholder expectations, how the site fits in the environment, and also plant demolition. This is applied right from the start when we develop our restoration plans and post-closure vision. Stakeholders are fully involved in the process, both officially via permitting and environmental impact assessments, and unofficially by collaborating with us as partners throughout the lifecycle of an operation.

An important principle in closure planning is progressive rehabilitation. This limits our environmental footprint and enables us to maximise our contribution to several of the United Nations' Sustainable Development Goals.

Closure planning is a process of continuous improvement. We therefore require our sites to update their closure plans on a regular basis. The ultimate goal is to make the closure plan a management tool as it integrates multiple sustainability aspects (compliance, risks, permits, land management, environmental impacts, financial aspects).

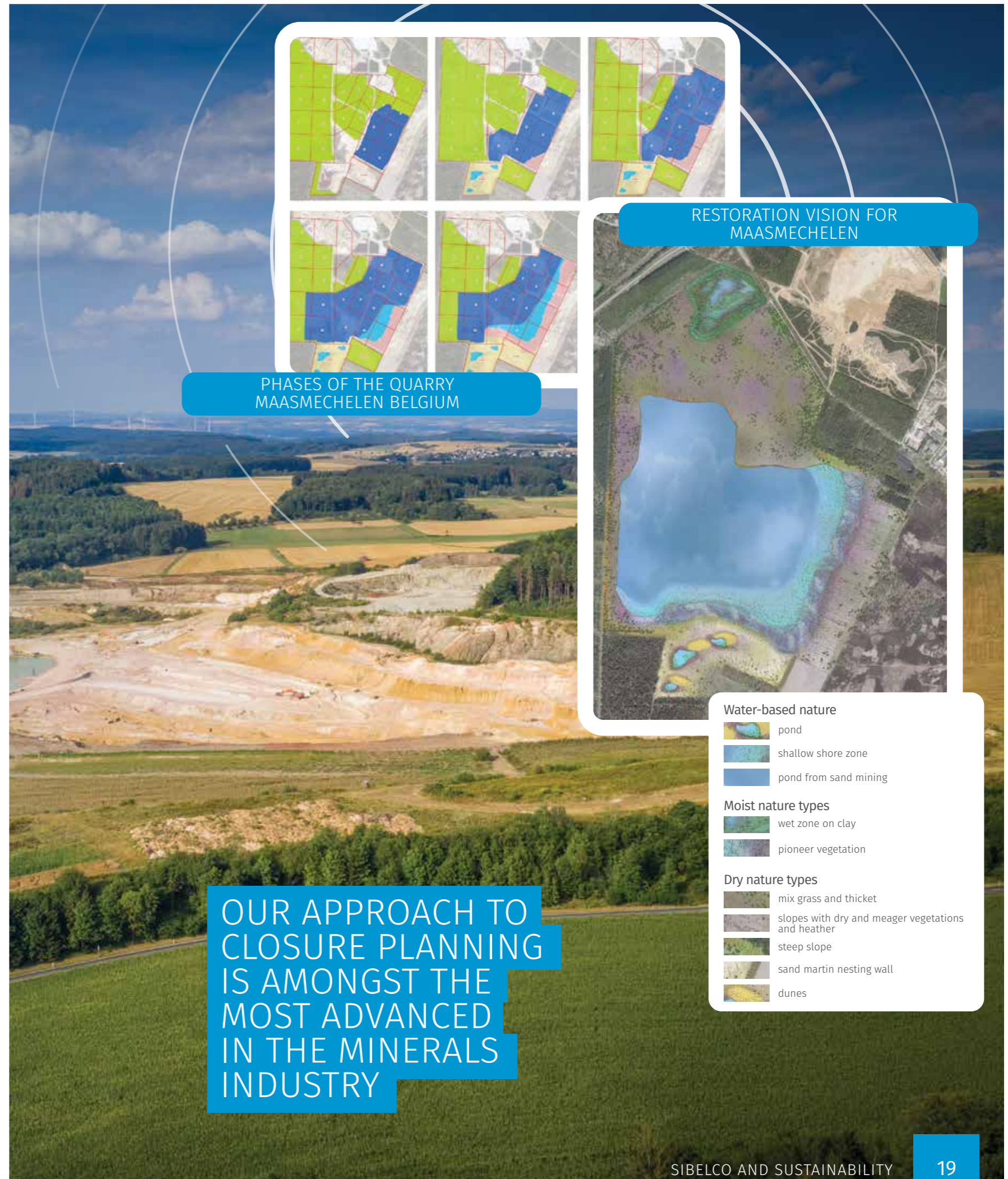
To support our broader legacy management, we developed an Ecosystem Services Calculator tool to enhance the planning and sustainable operation of our quarries. Developed in association with VITO (an independent Flemish research organisation focused on cleantech and sustainable development) the calculator helps us to make decisions that will deliver the best possible outcomes for ecosystem services and biodiversity. It does this by comparing rehabilitation scenarios, evaluating a site's surrounding ecosystem before quarrying begins and how it will be affected during and after mineral extraction.

We added management variables to the tool to allow a site-specific approach. Currently these focus on biodiversity and recreation, and in the future we will add water and other environmental impacts.

In 2023 we will announce a target to decrease the percentage of disturbed land versus total land managed.

Monitoring

We monitor our land portfolio (owned and leased), land within a licence boundary, land use changes (disturbed versus total land managed) and the number of sites with an approved closure plan in place according to the Sibelco standard.



PHASES OF THE QUARRY MAASMECHELEN BELGIUM

RESTORATION VISION FOR MAASMECHELEN

- Water-based nature**
 - pond
 - shallow shore zone
 - pond from sand mining
- Moist nature types**
 - wet zone on clay
 - pioneer vegetation
- Dry nature types**
 - mix grass and thicket
 - slopes with dry and meager vegetations and heather
 - steep slope
 - sand martin nesting wall
 - dunes

OUR APPROACH TO CLOSURE PLANNING IS AMONGST THE MOST ADVANCED IN THE MINERALS INDUSTRY

HEALTH AND SAFETY

Context

The safety and wellbeing of our people and contractors is our number one priority. No job is so important that it cannot be done safely. We are committed to our goal of zero injuries, working together to ensure that everyone returns home safely after each working day.

Approach

Our Get to Zero health and safety programme is built around 3 pillars:



Safe Plants

We continuously evaluate the safety of our sites, addressing any identified risks through measures such as guarding and traffic management systems.



Safe Systems

Our site teams have developed Standard Operating Procedures to support safe working practices locally. A universal Last Minute Risk Assessment methodology has been introduced to support the proactive management of risk at Sibelco sites worldwide.



Safe Behaviours

All Sibelco managers, supervisors and frontline workers participate in our Safety Starts with Me training programme. Additional, more intensive training is provided for key personnel. The programme equips participants with skills and tools to identify and demonstrate safe behaviours, empowering people to speak up whenever they feel something is unsafe.

Through the levers of engagement, continuous improvement and critical controls management, we work to unite everyone around our common goal of safe & healthy workplaces for all.

Monitoring

Health and safety performance is measured via leading and lagging KPIs. Our target is zero fatalities and to reduce Recordable Incident Rate (RIR) to less than 1.5 by 2030.



COMMUNITY & STAKEHOLDER MANAGEMENT

Context

As well as our legal licence to operate, it is essential that we maintain our social licence to operate by developing close and trusted relationships with local stakeholders and through national and global partnerships. This results in fewer legal complications and shorter permit processes.

Approach

Best practices for developing positive stakeholder relations are shared across the group. Each Sibelco site develops a stakeholder plan aligned with local conditions and objectives with employees encouraged to get involved in social and environmental initiatives.

Examples of social engagement projects include public open days, school visits, tree planting days and support for local clubs and societies. When mining activity has a significant local impact, such as river and road diversions, planning and implementation is carried out in full consultation with neighbouring communities and stakeholder groups. We proactively involve stakeholders in our permitting process and restoration planning. We monitor all stakeholder projects, the awards we receive and all stakeholder plans that we develop.

Monitoring

We have set a target that all Sibelco sites will have a formal stakeholder engagement plan in place by 2030, and we closely monitor our yearly community investments.

IN 2021, WE SPENT €0.7M ON COMMUNITY AND STAKEHOLDER ENGAGEMENT WORK



CLIMATE CHANGE AND GREENHOUSE GAS EMISSIONS

Context

The Paris Climate Agreement of 2015 set the goal of limiting global temperature rise to below 2°C. Although the global minerals industry accounts for less than 0.5% of total CO₂ emissions, all industries have a role to play in achieving the targeted reductions.

Approach

In 2021 Sibelco has set an ambitious target to reduce Scope 1-2 emissions intensity (tonnes CO₂ / revenue) by 5% per year from 2021 to 2030, cumulatively 37% when we keep the same scope of activities.

An engagement target for scope 3 emissions was announced in 2022 after consultation with customers and suppliers. We have set up partnerships with key customers in our main markets to help accelerate decarbonisation.

These targets are in line with best practices promoted by the Science Based Targets initiative (SBTi) and the “well below 2° scenario”.

The 5% per year scope 1-2 intensity reduction target is one of the toughest set to date by any business in the industrial minerals sector. We will invest approximately

€90 million in new technologies and operational excellence initiatives over the next nine years to support this goal.

By setting this ambitious reduction target, we are demonstrating our commitment to the zero-carbon transition aligned with the Paris Agreement. As a minerals company, we also include land use in our carbon strategy. We have developed a methodology to evaluate land use changes in relation to CO₂, for example the incorporation of more wetland areas within restoration plans through which to capture carbon.

Monitoring

Energy consumption and CO₂ emissions from our operations are monitored via intensity and absolute emissions KPIs. We also monitor the progress / implementation of de-carbonisation projects.

We have detailed our scope 3 emissions, especially the category “processing of sold products” which represents about 76% of our total footprint. We measure overall progress in the customer and supplier engagement, plus scope 3 emissions per customer, per application and plant of origin.

OUR TARGETS ARE VALIDATED BY SBTi AND SUSTAINALYTICS ASSESSED OUR CO₂ FRAMEWORK

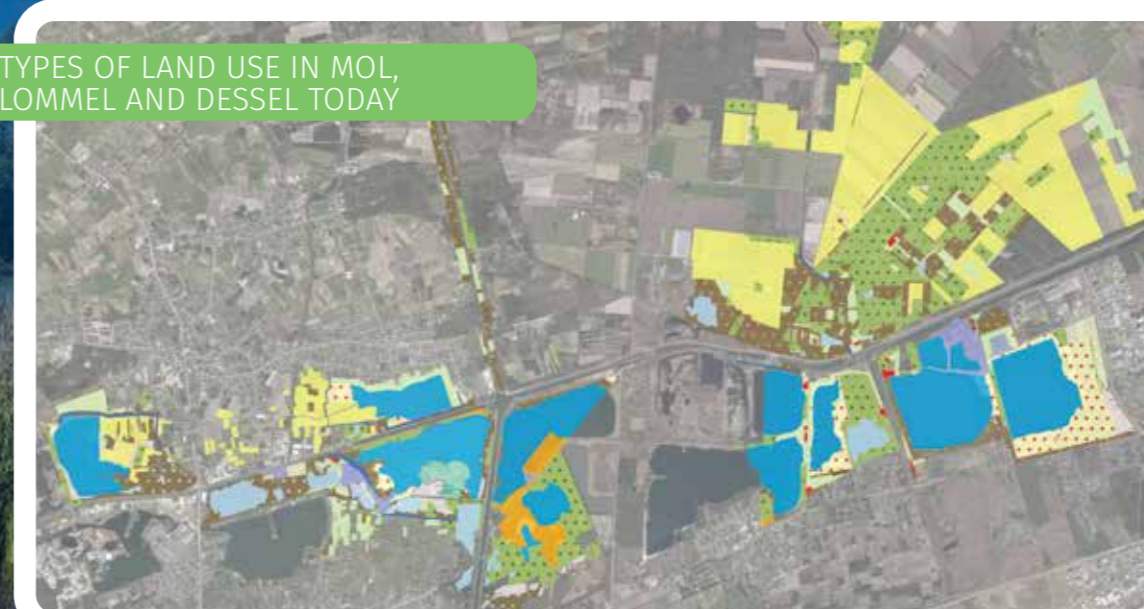
CASE STUDY

SIBELCO OWNS OVER 15,000 HECTARES OF LAND AND LEASES A FURTHER 3,000. TO DISCOVER HOW DIFFERENT LAND USE COULD POSITIVELY AFFECT CLIMATE CHANGE THROUGH CARBON SEQUESTRATION, 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.

TYPES OF LAND USE IN MOL, LOMMEL AND DESSEL TODAY



- | | |
|-------------------------------|----------------------|
| Trees/Drifts | Cropland |
| Coniferous forests | River |
| Deciduous forest dry | Shallow water bodies |
| Deciduous forest wet | Deep water bodies |
| Bare sandy soil.Active quarry | Recreational terrain |
| Heathland | Built area |
| Wetland/Marshland | Industrial sites |
| Poor grassland/Nature | Photovoltaic |
| Grassland/Agriculture | Infrastructure |

DUST & NOISE

Context

To maintain a good relationship with local communities, it is imperative to minimise any dust and noise created by mining, production and the transportation of materials. To become a neighbour of choice, this means going beyond legal requirements.

Approach

Noise and dust are evaluated upfront as part of our environmental impact studies. Mining operations are subsequently designed to minimise emissions.

Once operational, our sites focus on monitoring of nuisance dust, suppression techniques (such as water spraying in quarries) and monitoring of fine particles.

Best practices on dust and noise mitigation are shared across the business with the objective to reduce emissions..

Monitoring

We monitor noise and dust emissions at plant and quarry level.

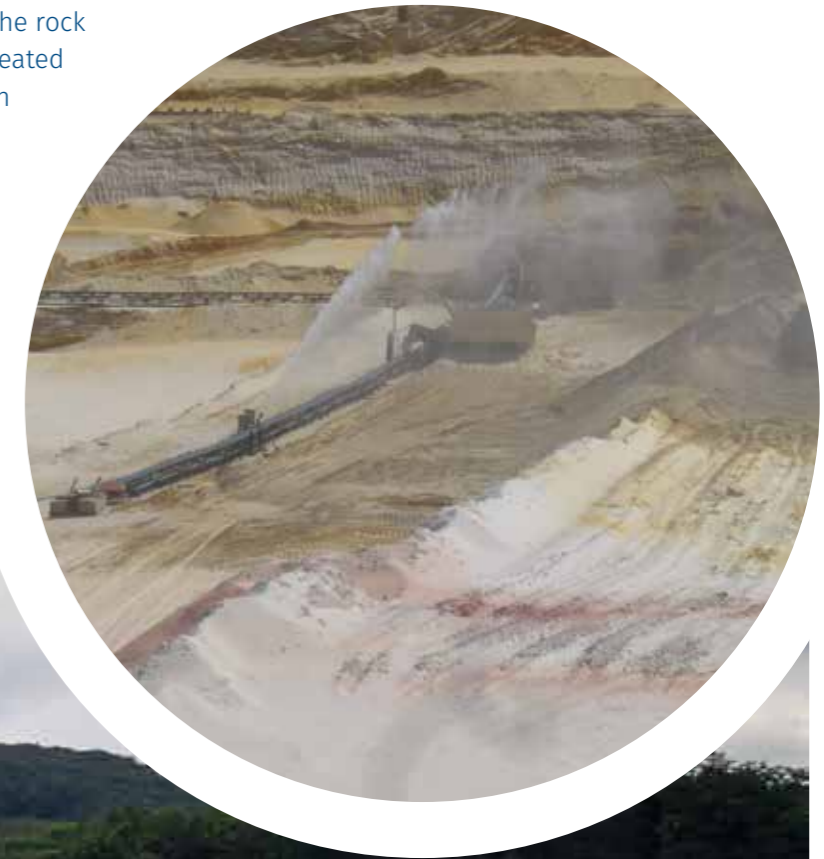
CASE STUDY

OUR BEDOIN SILICA SAND SITE SITS AT THE FOOT OF MONT VENTOUX (FRANCE) IN AN AREA SUBJECT TO THE MISTRAL, A STRONG NORTH WIND THAT CAN MOBILISE DUST. WE BEGAN STUDIES BACK IN 1998 TO BETTER UNDERSTAND THE EFFECTS OF WIND ON THE QUARRY AND HELP US PUT IN PLACE DUST REDUCTION MEASURES.

In the quarry, stripping work is carried out during the wettest periods, sand is transported via covered conveyor belt, vehicle tracks are watered during dry periods, exposed surfaces are sprayed with biodegradable fixative and vegetation allowed to grow. Hosing of the quarry faces is triggered automatically by the factory's weather station or forecasts and digitally controlled.

At the plant, sand storage bins are embedded in the rock and covered, gas from the dryers and coolers is treated by a wet scrubber, the loading station is fitted with a dust collector, and lorries carrying wet sand are covered whilst dry sand is transported by tanker.

All these measures have become essential to Bedoin's operating permit. An annual report on the interpretation of dust fallout measurements is sent to the local administration, and a stakeholder monitoring committee is regularly organised to communicate results and future actions.



WATER

Context

Water scarcity and quality has become one of the world's biggest challenges. Whilst the minerals sector only accounts for a fraction of the world's water stress, mining operations can have a big impact locally.

Water is essential in mineral extraction and processing with supplies often obtained directly from groundwater, streams, rivers and lakes before being safely discharged back into the environment. It is essential that this cycle is carefully and continuously monitored and controlled.

Sibelco can also support the water strategies of local authorities through the use of quarries as emergency buffers and mined-out areas for flood storage. We have already set up such partnerships in Belgium and the UK.

Approach

A dedicated cross-functional team helps our sites to improve water management with best practices shared via our Water Platform.

Our improvement activities focus on both water quantity and water quality and all sites have a clear roadmap in place. BATNEEC* principles are promoted and applied when new plants are built and capex projects executed.

We are working towards the mapping of water input/output at all of our sites. We perform groundwater modelling where it is required, this will enable us to announce water targets in 2024-2025.

Monitoring

We measure the number of sites applying BATNEEC principles, water abstraction and discharge at site level with the objective to improve our water balance.

CASE STUDY

IN BELGIUM, OUR DESSEL, MOL AND LOMMEL QUARRIES CONNECT WITH ONE ANOTHER. ANY IMPACT ON GROUNDWATER, NEARBY PROTECTED NATURE AREAS AND AGRICULTURAL LAND NEEDS TO BE CLOSELY MONITORED. TO DO THIS, WE SET UP A GROUNDWATER MODEL WITH VITO (FLEMISH INSTITUTE FOR TECHNOLOGICAL RESEARCH) IN 2000.

This involved the installation of a network of monitoring wells across the region. After finetuning over the years, the model now provides accurate predictions on, for example, desiccation and rewetting of surrounding areas, allowing us to take mitigation actions when needed.

We use the model for environmental impact assessments, permit applications and continuous monitoring. Its output is respected by all authorities and even used for other projects of public interest, such as Climate Quarries as part of Blue Deal - a Flemish program to fight the impacts of climate change.

GOOD WATER
MANAGEMENT
IS VITAL IN
SUSTAINABLE
LAND USE



BIODIVERSITY, ECOSYSTEM SERVICES AND LAND USE

CASE STUDY

AUGUST THYSSEN IS A FORMER SIBELCO QUARTZITE MINE. THE SITE HAD BEEN QUARRIED FOR OVER 100 YEARS BEFORE BEING TRANSFORMED INTO A STUNNING NATURE CONSERVATION AREA IN THE HEART OF GERMANY'S WESTERWALD REGION

With a 1.4 hectare lake surrounded by red alder and pastures, August Thyssen is today home to a diverse array of flora and fauna. This includes protected species of birds as well as amphibians such as the European tree frog, and yellow-bellied and natterjack toads that have been attracted to the site in increasing numbers through the creation of special shallow-water spawning ponds.

The creation of spawning ponds has been expanded to different areas of the site over the years, ensuring that August Thyssen has become a highly successful haven for important wildlife and is a prime example of how a former mine can bring multiple benefits for biodiversity.



Context

The degradation of ecosystems and biodiversity is a global problem. If not managed responsibly, mining can lead to direct loss of habitats and protected species.

But mining can also create value for nature and ecosystem services through everyday activities such as earth movement, uncovering geological substrates, changing topography and the creation of slopes. Sibelco consciously leverages such opportunities throughout the lifecycle of our mines to increase our natural capital contribution.

The European Commission launched its biodiversity strategy for 2030, incorporating the Natura 2000 network of nature protection areas across the continent. Biodiversity is also a key area within the European Green Deal, whilst new legislation such as the EU restoration law only increases the importance of pro-actively managing biodiversity.

Approach

We developed our natural capital and biodiversity strategy back in 2016. Local teams use our biodiversity toolkit to create a targeted approach for each site. Through our global protected species program, we encourage local site teams to create habitats for quarry-specific species, carefully balanced with mining activities. Our Ecosystem Services Calculator allows us to scientifically evaluate different restoration scenarios for our quarries and to introduce management actions to improve biodiversity.

Our biodiversity approach has earned us several awards from the Industrial Minerals Association of Europe, the Wildlife Habitat Council and many others.

We recently entered into a partnership with Birdlife International (the world's largest nature conservation partnership) with whom we will work to further improve biodiversity through conservation and restoration locally (at our sites), nationally and internationally. At the same time, we continue to strengthen local partnerships with NGOs and the Wildlife Habitat Council.

We have announced ambitious targets to develop biodiversity management plans for all our sites, including invasive species programs. We are committed to increasing valuable habitat types and supporting target species. The baseline will be set by 2024 and targets will be announced.

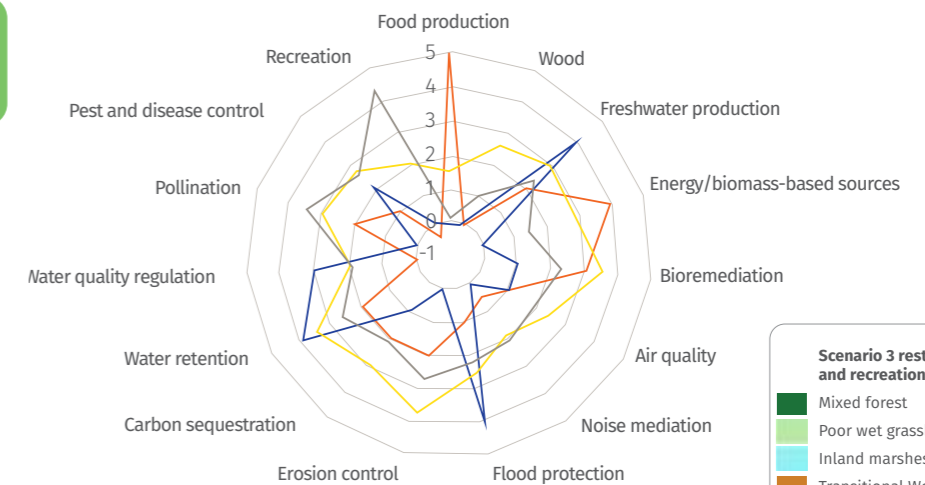
Monitoring

We monitor the number of sites within or close to Natura 2000 protected areas, the number of biodiversity projects in which Sibelco participates, the number of local partnerships, number of awards received, and the amount of positive press coverage generated.

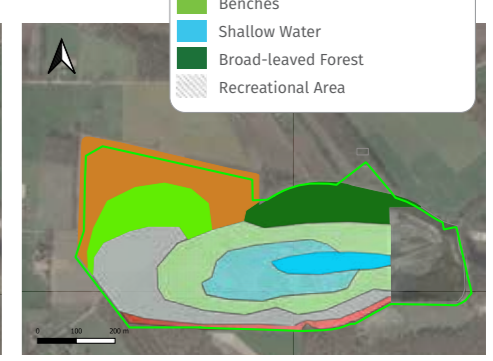
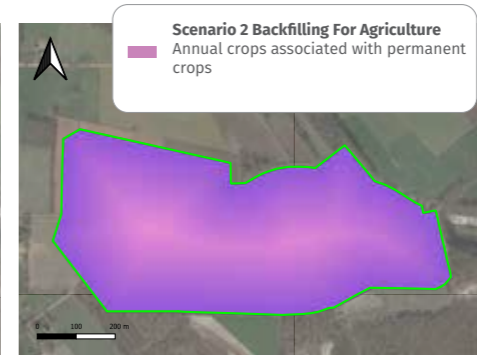
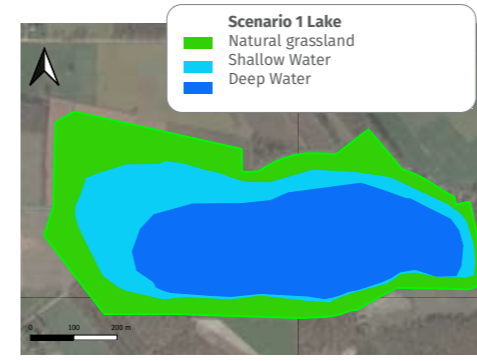
We map and assess the impact our restoration schemes across the world, helping to improve our performance and support the battle against climate change.

AN ECOSYSTEM SERVICES ASSESSMENT

- Lake
- Backfilled to agriculture
- Restored to nature and recreation
- Without a quarry



- ### Scenario 3 restoration to nature and recreation
- Mixed forest
 - Poor wet grasslands
 - Inland marshes
 - Transitional Woodland Shrub
 - Bare rocks of chalkstone
 - Benches
 - Shallow Water
 - Broad-leaved Forest
 - Recreational Area



WASTE, CHEMICALS, TAILINGS & POLLUTION

Context

Alongside climate change and biodiversity loss, environmental pollution is a major risk to human and ecosystem health. Legislation is used to mitigate this risk, much of which is underpinned by the polluter pays principle.

Sibelco must address the safe disposal of all waste created via the extraction and processing of mineral resources. Depending on local legislation, this includes materials such as topsoil, overburden, waste rock and tailings (materials left over after extraction of the target mineral).

The geotechnical and stability aspects of waste storage and tailing areas is also included in safe mining principles. Any accidental pollution must be properly mitigated.

Approach

Our sites use various techniques to prevent or reduce waste and tailings with best practices shared across the business. When required, specific waste management plans are developed.

Environmental and geotechnical risk management is in place and monitored for water reservoirs, sedimentation basins, tailing lagoons and dams. We have a dedicated tailings working group made up of colleagues from geology, sustainability and operations.

Incident management and root cause investigations are performed in case of accidental spills. Areas with historical soil pollution are mapped and provisions made via the site's closure planning exercise. We introduced a yield indicator dashboard with the objective to reduce waste at site level. We launch pilots to improve yield by directing and correcting marketable product losses in mining and processing, and we challenge customer specifications.

Monitoring

We measure all mining waste and other waste generated by Sibelco sites with the aim to reduce waste.

CASE STUDY

OUR BASKARP QUARRY IN SWEDEN IS LOCATED NEXT TO LAKE VATTERN (A NATURA 2000 AREA) AND SOME OF THE FINE FRACTIONS OF OUR SAND ARE RELEASED INTO THE WATER. WE HAVE ESTABLISHED A WORKING GROUP TO LOOK AT THE POTENTIAL IMPACT SUSPENDED SOLIDS COULD HAVE ON THE LAKE'S PROTECTED FISH SPECIES.

The working group is developing different scenarios. As part of a global biodiversity program established between Sibelco and the University of Hasselt (Belgium), the site was visited by a professor and his students to monitor status of the lake and its fish.

We measure and strive to reduce mining waste and other waste generated by all Sibelco sites.

SUSTAINABLE PRODUCTS

SIBELCO MINERALS ARE USED TO CREATE SOLUTIONS THAT TACKLE CLIMATE CHANGE, SUCH AS SOLAR PANELS, WIND TURBINES AND BUILDING INSULATION MATERIAL. BUT THE SHIFT TOWARDS A CIRCULAR ECONOMY MEANS THAT WE MUST FIND NEW WAYS TO INTRODUCE MORE SECONDARY RAW MATERIALS TO OUR PORTFOLIO. THIS WILL BE AN IMPORTANT PART OF OUR JOURNEY TOWARDS LEADERSHIP IN SUSTAINABILITY.

Sibelco is already Europe's leading glass recycler, a prime example of the circular economy in action. Each year we transform over 3 million tonnes of glass waste into premium quality cullet, helping glass manufacturers to close the loop and get more from their raw materials. It means that less waste goes to landfill, less primary raw materials are needed to make new glass, and less CO₂ emissions are generated during the glass manufacturing process.

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.

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. If successful, the three projects combined could generate up to €50m revenue for Sibelco.

OUR GOAL IS TO INCREASE THE PERCENTAGE OF COMPANY REVENUE GENERATED FROM PRODUCTS SUPPORTING THE CIRCULAR ECONOMY TO AT LEAST 20% BY 2030

SUSTAINABLE PRODUCTS

CASE STUDY

SIBELCO'S INNOVATIVE NEW SOILFEED RANGE OF MATERIAL SOLUTIONS HELP TO NATURALLY RESTORE FOREST SOILS TO FULL HEALTH, PLAYING A KEY ROLE IN PROTECTING THE BIODIVERSITY OF ONE OF THE WORLD'S MOST PRECIOUS HABITATS.

Soil is a vital element of the forest ecosystem, helping to regulate important processes such as nutrient uptake, decomposition and water availability.

But forest soils are particularly susceptible to the effects of acid rain caused by atmospheric pollution, whilst some sandy woodland soils are naturally acidic. The soils of conifer forests can also be prone to acidity as conifer trees tend to absorb more airborne nitrogen and sulphur. If a soil is too acidic it becomes deficient in essential macronutrients, leaving trees and plants less healthy and more vulnerable to disease.

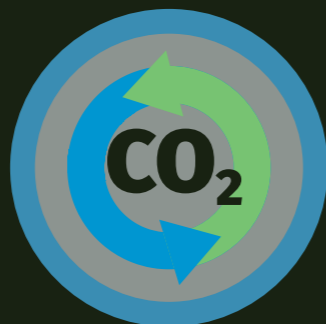
Sibelco's innovative new Soilfeed range of material solutions are slow-release treatments, providing a range of long-lasting benefits with just one application. It helps to naturally restore damaged soils, steadily increasing pH levels to reduce acidity whilst adding new mineral nutrients. Soilfeed is a processed volcanic rock, formed through the cooling and solidification of magma or lava. Scientific studies show that volcanic ash has created the world's most fertile soils.

Generated during the mining of nepheline syenite rock at Sibelco's operations in Norway, Soilfeed is 100% natural with no chemical additives – it is created by nature and returned to nature in a 'cradle to cradle' cycle. Compared with other soil improvement products, Soilfeed has a relatively low carbon footprint and has none of the adverse side-effects associated with chemical-based soil fertilisers.

By returning soil to full health naturally, Soilfeed helps to protect both flora and fauna and support the biodiversity of our planet's precious forests.



forests cover around **4 billion hectares** or **30%** of the earth's land surface



after oceans, forests are the world's largest **storehouse of carbon**



SUSTAINABLE PRODUCTS



CASE STUDY

Glass Recycling

SIBELCO IS EUROPE'S LEADING GLASS RECYCLER. EVERY YEAR WE SOURCE OVER 1 MILLION TONNES OF WASTE GLASS AND TRANSFORM IT INTO 1 MILLION TONNES OF HIGH-QUALITY CULLET, WHICH IS THEN USED TO MAKE BRAND NEW GLASS AND OTHER PRODUCTS.

As global demand for bottles and jars continues to grow, glass recycling makes perfect environmental and economic sense. Recycling means that less glass waste goes to landfill, whilst reducing the amount of primary raw materials needed to make new glass. And as it takes considerably less energy to melt recycled glass (cullet) than it takes to melt raw materials, recycling also means less CO2 emissions generated during the glass manufacturing process.

At our recycling plants in Belgium, France, Italy and the UK, our unique process removes metals, plastics, paper and card from the waste batch, before filtering the remaining glass by size and purity. Optical sorting technology then separates the cullet into four distinct colours. The final product is sent to our glass customers to re-enter the manufacturing process, completing a valuable closed-loop recycling process.

LOCAL IMPLEMENTATION: **WINTERSWIJK**

SITTING IN THE FAR EAST OF THE NETHERLANDS, CLOSE TO THE GERMAN BORDER, WINTERSWIJK IS A UNIQUE GEOLOGICAL SITE WHERE LIMESTONE RISES TO THE EARTH'S SURFACE. THE AREA HAS BEEN ACTIVELY MINED SINCE 1932.



OUR MAP OF EXCELLENCE FOCUSES ON TODAY'S PERFORMANCE, WHILST THE RISK ASSESSMENT ENSURES THAT WE PROACTIVELY ANTICIPATE TOMORROW'S CHALLENGES.

Sibelco introduced a structural approach to measure the sustainability performance of our sites on an annual basis back in 2014. We evaluate the current performance of sites in different sustainability areas against internal standards with our Map of Excellence on Sustainability. We also identify and assess future risks for each site, ensuring that we focus on both today and tomorrow. All issues and potential risks are then managed through our List of Projects on Sustainability.

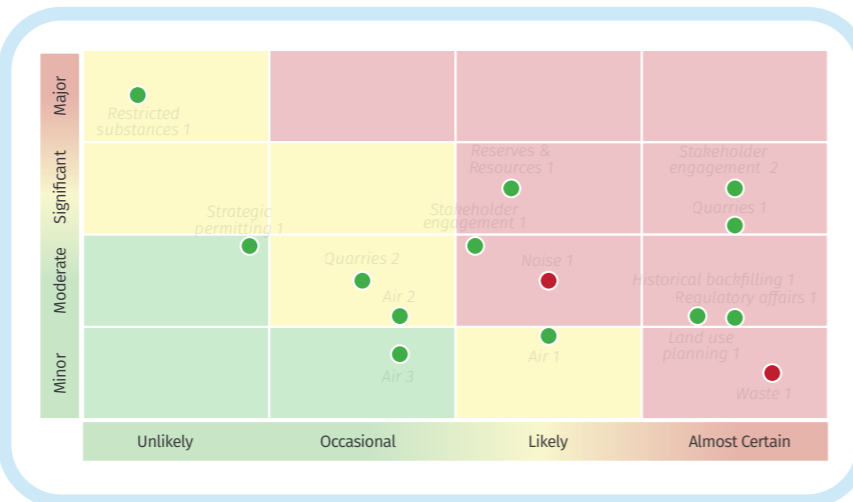
LOCAL IMPLEMENTATION: WINTERSWIJK

Our site spans approximately 20 hectares, located in an agricultural area and next to a Natura 2000 protection zone which is managed by the State Forestry Department. Materials extracted and processed at Winterswijk are used in road construction, concrete, ceramics and agriculture.

The Winterswijk operation comprises a crusher, 3 drying and grinding installations, a blender, slurry plant, laboratory, technical workshop, 32 silos, a weighbridge, a wastewater sedimentation facility and a washing location for quarry equipment and trucks.

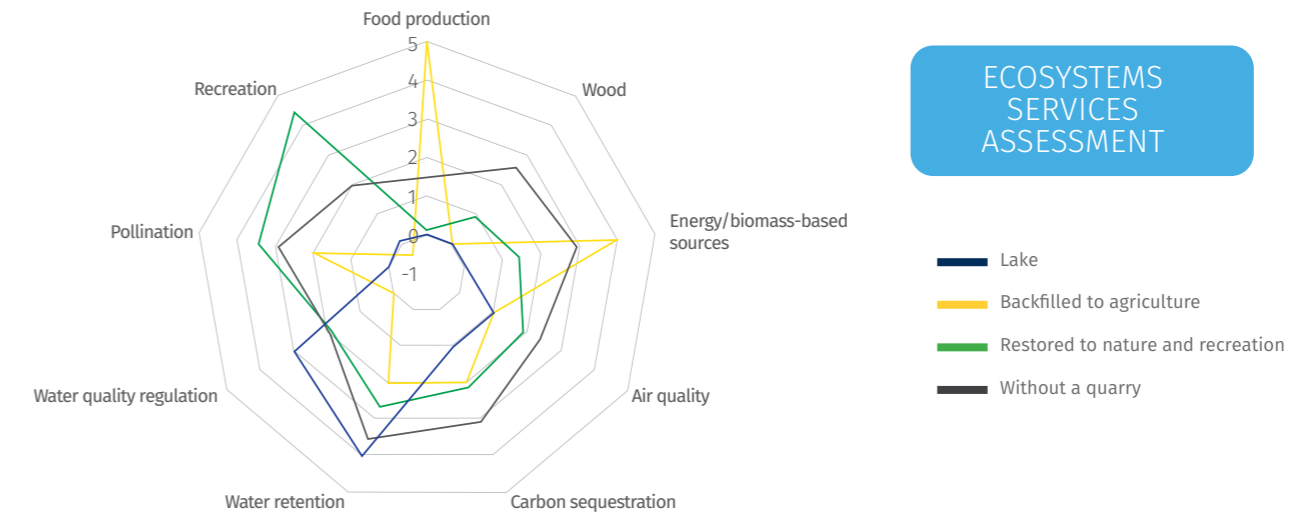
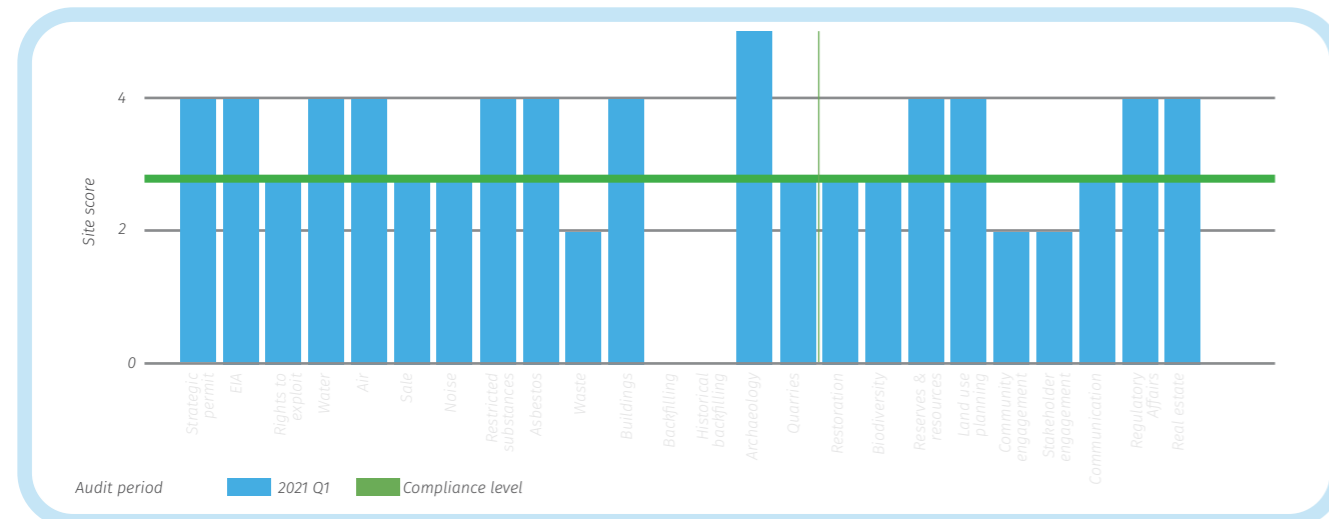
Risk Assessment

TOMORROW'S CHALLENGES



Winterswijk Map of Excellence

TODAYS PERFORMANCE



Strategic Permitting

Our licence to operate at Winterswijk is made up of 3 permits that together cover and regulate all activities:

- excavation permit
- environmental permit (covering noise, dust, emissions to air and safety)
- nature permit (covering NOx-deposition, effects on nature conservation targets described in conservation plan for flora and fauna)

All three can only be granted if the zoning plan allows for the activities within the permit application. A fitting zoning plan is therefore the first step in the whole process.

The local zoning plan needs to fall in line with the provincial zoning plan, requiring the support of both local and provincial government. Influencing the set-up of both plans is crucial to ensure approval. Also, the national zoning plan needs to specify that excavation should be possible. This is supported by the national organisation of sandmining companies (Cascade).

The zoning plan and permits are open to the democratic process of appeal, which ultimately might reach the highest court. This emphasises the importance of active stakeholder management with our neighbours and the involvement of NGOs as early

as possible. When a court case cannot be avoided, our case is strengthened if we can show the early involvement of all relevant stakeholders.

Social Impact

To support local tourism, we work in close partnership with the Steengroeve Winterswijk Cultural Association to open the quarry as a spectacular setting for a theatre production that runs for four consecutive days. The event, which is held most years, welcomes more than 12,000 visitors, providing a huge boost for the local economy.

Winterswijk also welcomes geologists and palaeontologists. The quarry sits on the Lower Muschelkalk seam of limestone, formed over 200 million years ago during the Triassic period. The site is famous for fossils, and we have developed close ties with the universities of Bonn, Utrecht, Amsterdam and Leiden, all of whom regularly send students and experts to study geological features and dig for fossils. Studies at Winterswijk even discovered a new species of Nothosaurus, a semi-oceanic reptile from the Triassic period.

The quarry is also open at weekends (under strict safety rules) to local geologists and palaeontologists and for guided tours organised by the local tourist association. Sibelco is currently working with local stakeholders to evaluate plans for a museum.



Environmental Impact

Climate Change & Greenhouse Gas Emissions

Winterswijk's materials are dried via heat generated by burning brown coal (lignite) and by diesel / gasoline. This results in a significant amount of CO₂ emissions, added to by the electricity consumed for grinding and milling.

In 2022, the use of brown coal and diesel will be replaced with natural gas, for which a new pipeline is needed. This will significantly reduce the site's CO₂ and NOx emissions. We are also assessing the feasibility of generating electricity via solar panels, located on the existing quarry walls or on adjacent agricultural land which is owned by Sibelco but not needed for expansion until 2030.

To reduce energy consumption, we joined the voluntary energy reduction scheme to implement all measures with a payback of less than 5 years. This has resulted in an energy efficiency improvement of 2% each year between 2011 – 2021.

Dust & Noise

Dust and noise are the main environmental aspects impacting our neighbours. As we are situated next to a natura 2000 zone and in a rural area, the permit conditions for noise and dust are already strict, leaving little room to go beyond regulated levels.

Activities that generate the most noise have been moved indoors over the years and extra noise insulation has been installed. This has resulted in a decrease in complaints and good relationships with most of our neighbours.

Dust emissions during processing are prevented by filters on the processing equipment. To minimise dust generated by works in the quarry and the storage of minerals, storage is covered or dampened wherever possible, quarry roads are kept moist and open terrain is cleaned regularly. To prevent dust on the public road, truck tyres are cleaned before leaving the site.

Biodiversity, Ecosystem Services and Land Use

Rehabilitation of a former quarry zone has created a haven for a diverse range of wildlife including salamanders, eagle owls and butterflies, helping to ensure a biodiverse future. Quarry 2 is restored and integrated in the Natura 2000 network and is now a famous spot for bird watchers.

Our Ecosystem Services Calculator tool is being used at Winterswijk to evaluate different options for future land restoration.

Three potential scenarios for Winterswijk are the creation of a lake, the return of land to agriculture, and the creation of areas for nature and recreation. The calculator scores the impact of each scenario against a full range of ecosystem service considerations such as air quality, pollination, flood protection and food production, ultimately enabling us to select the best option.

A closure plan has been developed for Winterswijk and discussions with authorities and other stakeholders are ongoing.

Water

As limestone is impermeable, storm water collects at the bottom of the quarry. This water is either pumped out to surrounding ditches to top up the local water system during dry periods, or used for slurry production to reduce intake of fresh water.

A special seepage screen (known as a kwelscherm) is installed on one side of the quarry to prevent adverse impact of any groundwater level changes on the Natura 2000 area.

Sustainable Products

Since the 1970s, Winterswijk has been converting fly ashes (that would otherwise go to landfill) into high quality filler materials for concrete and asphalt, thereby supporting the circular economy through the use of secondary raw materials. Another recycled material produced at Winterswijk utilises the chalk grains produced during de-calcination at drinking water facilities.

Because these products utilise waste-classified materials, legislation becomes more complex. Once implemented however, this creates little extra burden for our daily operations and today's increased focus on the circular economy should eventually result in a reduction in these regulations anyway.

- ● ● Walking trail
- Transitional Woodland Shrub
- Recreational Element: Caves of Limestone
- Cliffs
- Benches
- Solar Panels
- Shallow Water
- Pioneer Vegetation
- Limestone
- Forest
- Natural Grassland
- Visitor Centre
- Recreational Area

RESTORATION VISION

