

**METALS &
MINERALS**

ACHIEVING NET ZERO

ADVANCING DECARBONIZATION SOLUTIONS
FOR MINING & METAL INDUSTRIES



**BUREAU
VERITAS**



DEFINING NET ZERO

While achieving net zero emissions is the objective, there are different approaches to defining and measuring this target. Before beginning their journey to net zero, mining & metals companies must ensure they have a clear, common definition of what it means for their industry.

THE GROWING CALL FOR NET ZERO

Climate change is the primary challenge of our era, with society, businesses, regulators and shareholders increasingly calling for an accelerated energy transition. To achieve this, carbon-intense industries are adopting ambitious net zero targets that will steer them toward reduced emissions and greener, more sustainable operations.

Major mining companies worldwide understand the key role they have to play in the energy transition, and members of the International Council on Mining & Metals have committed to achieving net zero by 2050 or sooner¹. Mining companies at both the national and international level are looking to limit their greenhouse gas (GHG) emissions, recognizing that reaching net zero will require serious, sustained, long-term effort.

While there are many routes to reducing direct and indirect emissions from the mining & metals industry, it is likely that companies will need a project-specific approach. Bureau Veritas helps organizations assess their carbon footprint, identify emissions hotspots, and develop a net zero roadmap that defines clear actions for reducing emissions. We support clients to implement and evaluate improvement programs, and verify their information, enabling companies to communicate transparently about their progress toward net zero. We further help business and society through audits, independent certification and verification of their efforts to achieving net zero.

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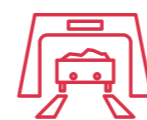
KEY FIGURES⁶



UP TO 7%
GHG EMISSIONS
from mining activities
worldwide



28% SCOPE 3
GHG EMISSIONS
from downstream
activity



**0.5% FULLY
ELECTRIC**
mining equipment

1. www.icmm.com
2. <https://sciencebasedtargets.org/resources/legacy/2020/09/foundations-for-net-zero-full-paper.pdf>
3. www.sdgs.un.org/goals
4. www.unfccc.int/climate-action/race-to-zero-campaign
5. www.ghgprotocol.org
6. <https://www.mckinsey.com/business-functions/sustainability/our-insights/climate-risk-and-decarbonization-what-every-mining-ceo-needs-to-know>

– What is net zero?

To reach net zero, a company's value chain must result in no net accumulation of CO₂ in the atmosphere, and no net impact from other GHG emissions². For mining & metals companies specifically, net zero is a commitment to both reducing emissions from their own operations and throughout the entire value chain.

– Who sets net zero targets?

The United Nations is pushing for net zero by mid-century through a variety of accords. These include the 2016 Paris Agreement, the Sustainable Development Goals (SDG)³, and the Race for Zero⁴ campaign. Companies, regulatory bodies, and governments can also set net zero targets. The European Union has announced its aim to be carbon neutral by 2050, and countries worldwide are setting their own national and local targets.

– What does net zero mean for the mining industry?

Net zero poses a significant challenge for the mining industry, as well as for the engineering, procurement and construction (EPC) companies and the complete supply chain that supports it. For these businesses, achieving net zero means measuring and reducing emissions from operations, improving energy efficiency, reducing the reliance on fossil fuels and consideration of carbon offsetting. Importantly, to achieve net zero, mining & metals companies must do this across the three emission scope categories defined by the Greenhouse Gas Protocol⁵.

THREE EMISSIONS SCOPES FOR ACHIEVING NET ZERO



Reducing Scope 1 emissions is the priority for most mining companies, enabling them to quantify emissions, improve data reliability and adopt industry best practices for reducing and minimizing emissions.

The GHG Protocol categorizes emissions into three scopes. Scopes 1 and 2 are direct and indirect emissions generated by an organization. Scope 3 encompasses emissions produced outside of an organization, but within its value chain. For mining companies, managing Scopes 1 and 2 is an obvious first step, while Scope 3 is a subsequent challenge that requires in-depth collaboration with suppliers and across the supply chain.

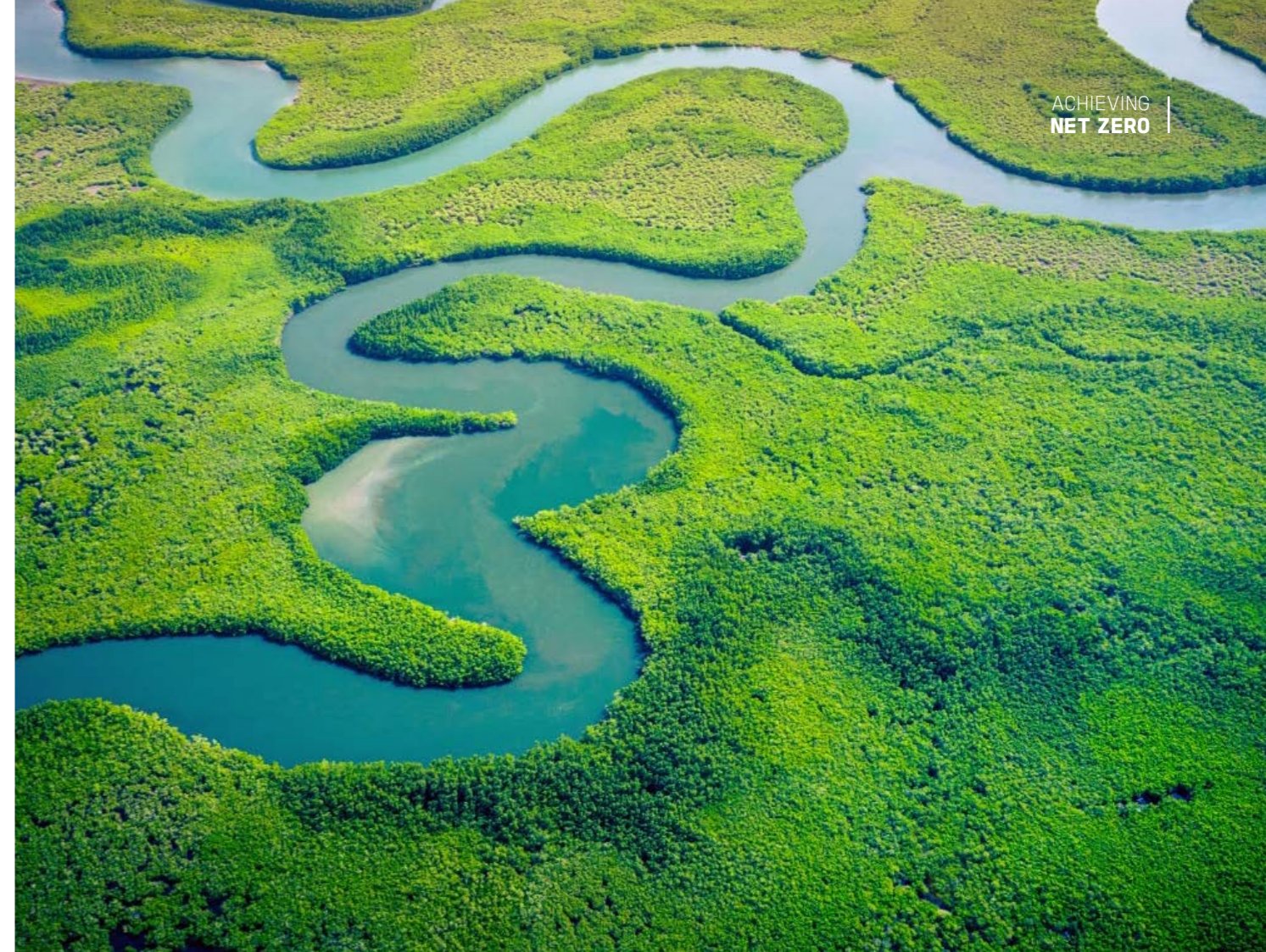
SCOPE 1 Minimizing GHG emissions

Scope 1 emissions are direct emissions from company-owned or controlled sources. For the mining & metals industry, main sources of Scope 1 emissions include stationary & mobile equipment, process emissions and land use.

Reducing Scope 1 emissions is the first priority for most mining & metals companies, enabling them to quantify emissions, improve data reliability and adopt industry best practices for reducing and minimizing emissions. Bureau Veritas' **Achieving Net Zero** solution helps manage this category of emissions by identifying emission hotspots at the asset level and properly implementing solutions to reduce GHG and carbon output.

SCOPE 2 Improving asset operations

For most businesses, indirect Scope 2 emissions are linked to the generation of electricity that has been purchased from a grid supplier. For mining & metals companies, this puts a focus on asset operations and particularly the use of electricity, steam, heat and cooling. Bureau Veritas' integrated **Achieving Net Zero** solution helps mining & metals companies create and implement a net zero roadmap.



SCOPE 3 Upstream and downstream indirect emissions

Scope 3 includes all other indirect emissions that occur outside of a company and its assets, but within its value chain, accounting for organizations' entire business ecosystem. These emissions are the hardest to track and control, but often represent the greatest share of a company's environmental footprint.

For mining and metals companies, Scope 3 emissions include the GHG impact from the use of the metal in industry and consumer products. For example, companies will be accountable for the emissions of the vessels that ship their products worldwide, despite not owning or operating the ships themselves.

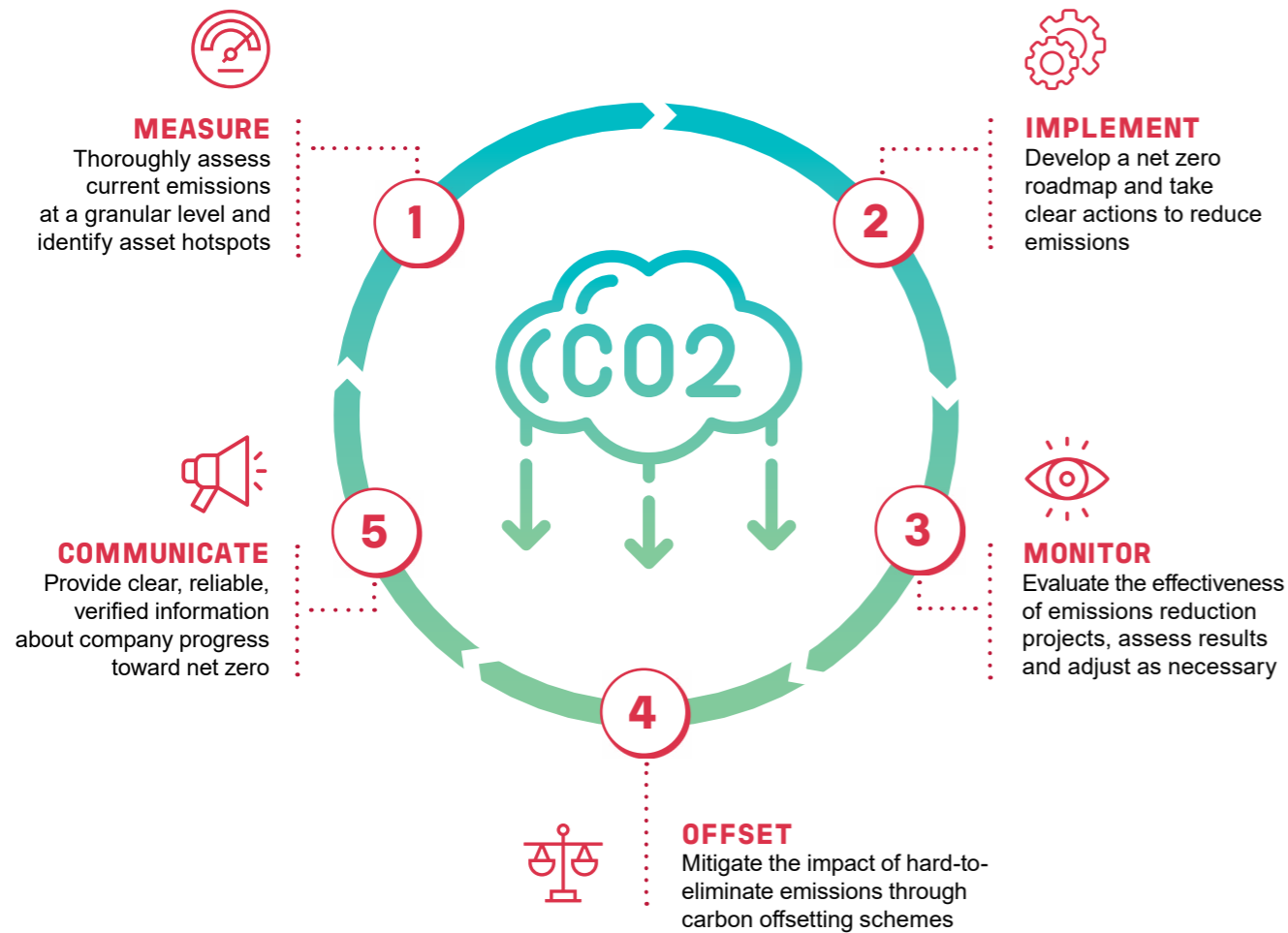
Within Scope 3, miners must push to limit these emissions, ensuring ships are designed to limit environmental impact, and use alternative fuels or propulsion methods. Companies can also finance and contribute to the development, production and scaling up of greener fuels, such as biofuels, green hydrogen and green ammonia.

EPCs: a role to play in reducing emissions across all scopes

A priority for EPCs is to support mining clients in accelerating the transition of their business to net zero. To this end, EPCs are developing their ability to deliver projects to cleaner standards internally, reducing their own Scope 1 and 2 GHG emissions. EPCs can also support mining companies by adopting new technology to help them reduce Scope 1 emissions, and achieving Scope 3 reductions as part of the metals & minerals value chain.

Bureau Veritas supports EPCs by providing independent verification. This ensures the reliability of customers' asset data, helps EPCs identify the right solutions and technology, and enables Bureau Veritas to validate emission reduction at project end.

A 5-STEP SOLUTION TO REDUCING EMISSIONS



Bureau Veritas' integrated, five-step Achieving Net Zero solution enables us to partner with mining and metals companies to reduce their emissions across all three scopes. We help clients accelerate their transition to net zero, providing an initial, targeted approach to minimizing emissions, while preparing for Scope 3 improvements.

SCOPE 1 & 2 Bureau Veritas' 5 step solution

Mining & metals companies and the value chain that supports them can use Bureau Veritas' five-step solution as a clearly defined roadmap toward achieving net zero. Our solution offers support for monitoring assets and value chain activities, improving emission data reliability, and effectively quantifying emissions based on industry best practices. It adds value by identifying a company's emission hotspots, in order to help clients implement clear actions that will sustainably reduce their impact. Our solution also accounts for long-term asset and system monitoring to verify progress, and helps clients understand and assess emissions offsetting and mitigation options.

1/5 MEASURE EMISSIONS TO IDENTIFY HOTSPOTS

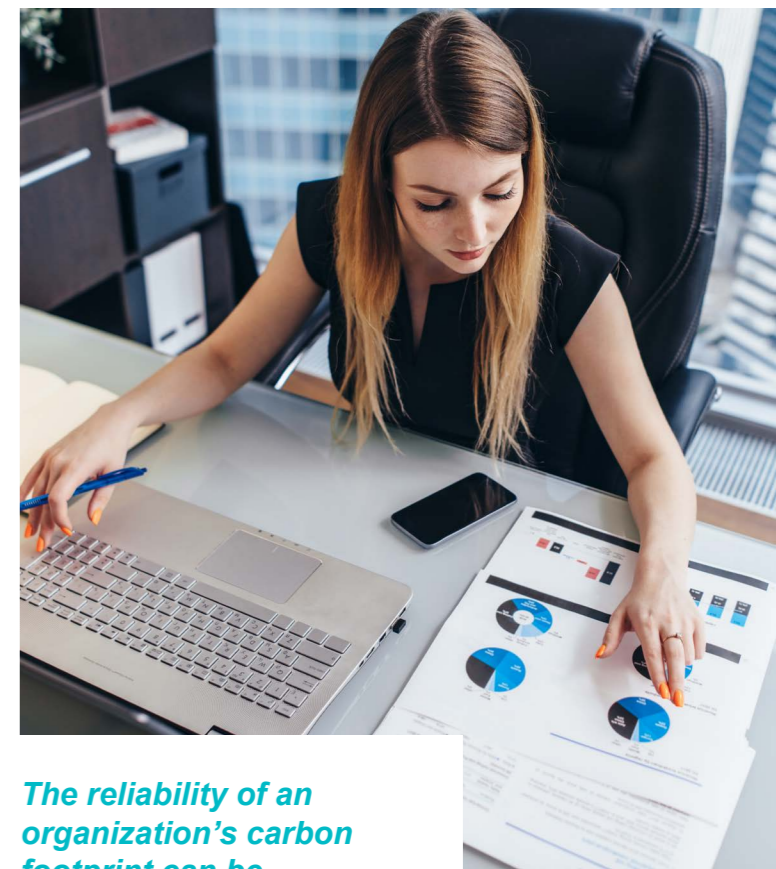
Before they can take action, mining companies should conduct a thorough assessment of their carbon footprint and measure the reliability of their emissions data at a granular level. This evaluation is vital to determining a starting point for improvement, identifying asset hotspots, and, once actions have been implemented, measuring progress.

A comprehensive carbon footprint evaluation is an essential first step to achieving net zero, with organizations reviewing data from numerous sources and areas. Data should be consolidated at asset, value chain, country and corporate levels to ensure the evaluation is an accurate reflection of a business' current emissions.

The reliability of an organization's carbon footprint can be significantly improved when carbon footprint data is verified by a trusted, independent third party. Bureau Veritas' *Achieving Net Zero* solution includes a review of all calculations at the asset and value chain level⁷, and field measurements as needed. Our experts verify that the measurements and methodologies used are correct and uniform, checking them against best practices and our internal data scoring system to ensure their reliability. In addition to an initial evaluation, Bureau Veritas engineers and data experts can review and update this data as often as required by the client.

A thorough carbon footprint assessment also provides an opportunity to identify emissions hotspots organized by emissions type across the value chain. It can pinpoint exactly which of a company's assets or value chain components is generating the most emissions and offer explanations for their output in terms of reliability. Giving priority to damaged or leaking assets, for example, can minimize emissions. The same is true for prioritizing assets that have been evaluated for integrity and proper maintenance.

By identifying hotspots and ensuring companies have reliable and comprehensive emissions data, Bureau Veritas can help decision makers choose and implement emissions reduction strategies.



The reliability of an organization's carbon footprint can be significantly improved when carbon footprint data is verified by a trusted, independent third party.

⁷ Including original measurements taken by third parties

2/5

IMPLEMENT CLEAR DECARBONIZATION ACTIONS

Once emissions hotspots have been identified and analyzed, and the data has been verified, miners can develop a strong, achievable, company-specific decarbonization roadmap. Bureau Veritas provides end-to-end support to mining and metals producers and marine stakeholders, helping them take action to reduce GHG emissions.



KEY FIGURES



328 AUDITORS
for conducting carbon emissions verification



500 AUDITORS
for Energy Management Systems (ISO 50001)



3,000+ AUDITORS
for Environmental Management Systems (ISO 14001)



500 ENGINEERS
working at Bureau Veritas' Technical Centers

– Developing decarbonization for mining and metal refining

For mining & metal refiners, CO₂ and NO_x are significant components of GHG emissions. Limiting these emissions is an immediate concern and can be achieved by improving management of energy and combustion, and fugitive emissions.

Bureau Veritas offers a number of solutions to these industry-specific concerns. Adopting a certified energy management system based on **ISO 50001**, for example, is becoming best practice for mining companies worldwide. Trained auditors can perform energy audits, assessing areas where energy efficiency can be improved and determining which utilities consume the most energy.

– Decarbonizing the energy supply

Power generation is a primary source of Scope 1 and 2 emissions for mining operations. To achieve net zero, operators are focusing on the electrification of assets, and moving to renewable power. By powering assets with clean energy from solar, wind or alternative fuels (e.g., biofuel, green hydrogen, green ammonia), operators can limit GHG output. And improve their energy efficiency by improving maintenance, minimizing asset downtime, and increasing asset monitoring.

Drawing on the expertise of our global network, Bureau Veritas offers a full suite of decarbonization services for mining operations. We help implement relevant standards and management systems for removing direct emissions, and provide technology qualification for green electricity solutions.



2025 PROJECTED DATE
for first commercial offshore hydrogen projects

KEY FIGURES



2023 EEXI AND CII REGULATIONS
come into force worldwide



3 NEW FUEL NOTATIONS
(Methanolfuel, Ammoniafuel, Ammonia-Prepared)



2 WIND PROPULSION NOTATIONS
(WPS-1, WPS-2)

– Moving the marine industry toward net zero

Bureau Veritas' Green Line of services and solutions empowers marine-sector organizations to implement strategies to achieve their sustainability objectives. Our experts support ship owners and shipyards in preparing vessels to use low-carbon or zero-carbon fuels. We do this by collaborating with industry stakeholders to develop the technical insight, rules and guidelines for future fuels like methanol, ammonia and hydrogen.

Our Rules and notations for onboard wind propulsion help clients reduce GHG emissions and minimize fuel burning and consumption. We also help clients understand carbon indexes like the **Energy Efficiency Design Index (EEDI)**, **Energy Efficiency Existing Ship Index (EEXI)**, and **Carbon Intensity Indicator (CII)**. This enables ship owners to implement technical and operational improvements onboard to reduce carbon emissions and improve energy efficiency.



MONITOR EMISSIONS FROM OPERATIONS

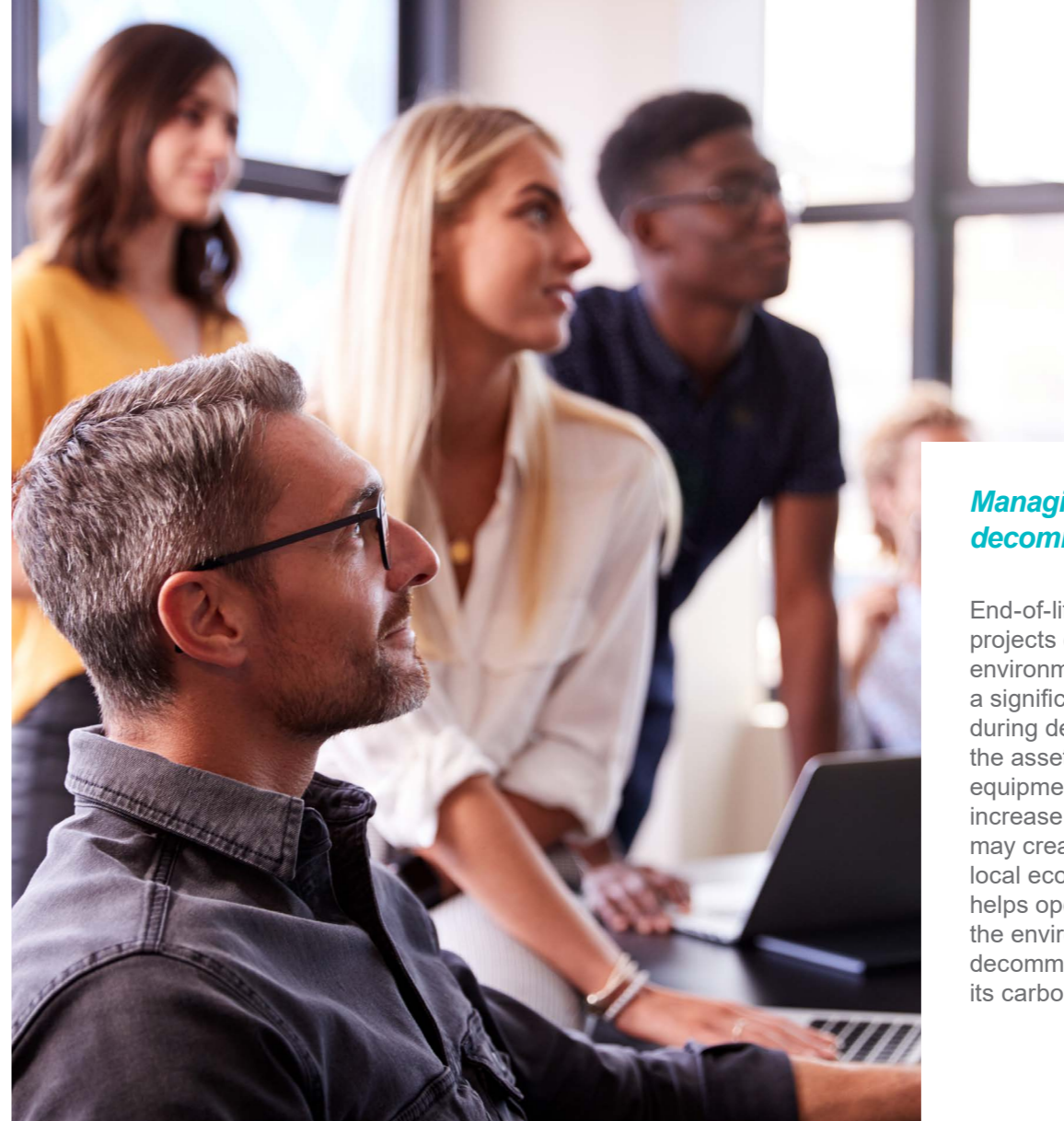
Once mining companies have implemented actions to reliably quantify emissions and focus on hotspots to reduce GHG emissions, it is important to monitor both specific assets and overall operations. Regular and accurate monitoring enables businesses to measure their progress, helping them meet sustainability targets and allowing them to adjust their plans where necessary.

Regular assessments and ongoing monitoring of assets enable mining companies to check that the right emissions hotspots were identified during their initial evaluation. Verifying the reliability of original measurements and calculations also helps measure the progress of KPIs once emissions reduction strategies have been put in place.

Bureau Veritas experts can work with clients to evaluate the impact of actions taken and adjust calculations through a yearly review of client data. A review can also take place at the end of any project. Our experts have experience in all testing, inspection and certification (TIC) services, enabling them to:

- Review compliance with environmental policy and regulations
- Assess methods of calculation and classify them in accordance with specific requirements and common or best practices
- Analyze information provided through reports and technical documentation
- Evaluate the need to integrate data through field audits to collect engineering, process, inspection and maintenance data
- Perform field testing and take additional measurements where required
- Modify the existing system or integrate new processes to improve reliability

Our goal is to create a virtuous cycle, in which data is regularly measured and verified, enabling companies to review their net zero roadmap and implement new actions.



Managing decommissioning

End-of-life activities for mining projects can have a big environmental impact. There is a significant increase in activity during decommissioning, and the assets used (eg. moving equipment, demolition) may increase Scope 3 emissions and may create further damage to the local ecosystem. Bureau Veritas helps operators determine the environmental impact of decommissioning and calculate its carbon impact.

- Guiding OPEX and CAPEX decisions

Our five-step Achieving Net Zero solution further includes support for setting up **OPEX** and **CAPEX** projects to reduce emissions from hotspots.

OPEX projects aim to modify existing systems to improve reliability. These might include optimizing inspection and maintenance cycles in order to reduce fugitive emissions, or improving asset integrity management to extend asset life and reduce energy consumption.

CAPEX projects focus on the installation of new technology and equipment, such as gas injection systems and turbines, or systems that provide continuous monitoring. For assets, CAPEX projects could include moving to renewable energy sources.

Bureau Veritas plays a technical advisory role, helping clients choose projects to launch, and guiding decision-making using clients' data and our roadmap. We offer support for project management, helping clients track progress and ensuring on time and compliant project delivery. We act as a TIC contractor, providing CAPEX services such as design review, QA/QC, regulatory, verification and monitoring services for OPEX projects. We further cover voluntary services, such as bolted joints management, asset integrity management and risk-based inspection.

For finished projects, Bureau Veritas can perform emission data verification and field measurement of emissions. We update emissions data within the **Achieving Net Zero** platform and confirm progress on defined KPIs, verifying the information that enables clients to communicate transparently about their progress.



OFFSET DIRECT CARBON EMISSIONS

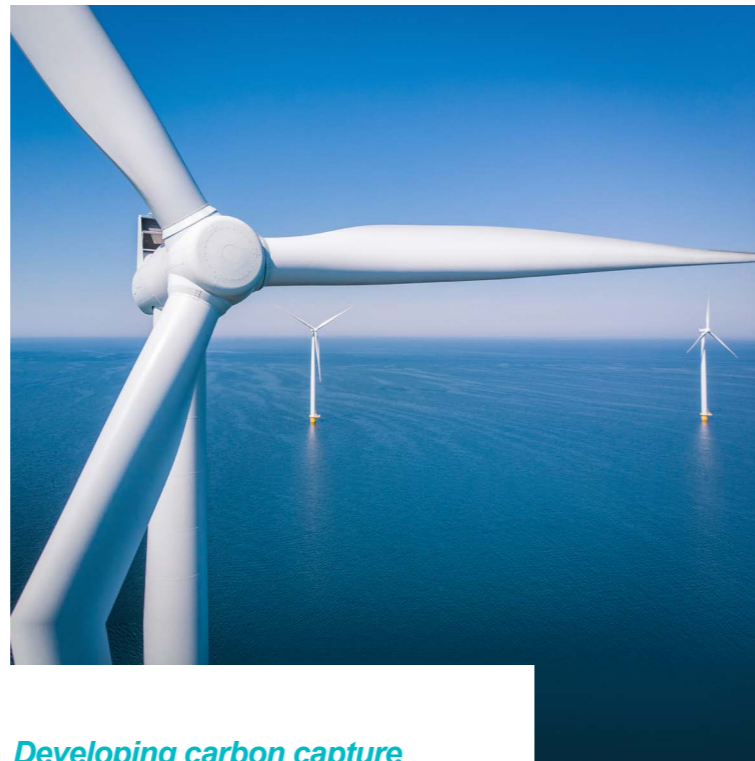
Not all GHG emissions produced by businesses can currently be eliminated, but this does not mean compromising on sustainability. Bureau Veritas plays a key role in supporting clients' carbon offsetting requirements. We do this by validating and verifying projects that generate carbon credits through internationally recognized schemes, or directly within the value chain⁸.

Carbon offsetting & removal schemes enable businesses to buy offset credits that contribute directly to projects outside of their organizations that reduce or remove GHG emissions. These include investing in clean energy technologies, purchasing and "retiring" carbon credits from emissions trading schemes, and supporting work to directly remove CO₂ from the air. This enables companies to compensate for their residual emissions.

While carbon offsetting is an increasingly common practice, it is intended to support net zero progress in a specific way. The goal is for businesses to invest in steadily decreasing their own GHG emissions and eventually achieving net zero.

Companies that choose to use carbon offsetting schemes must therefore ensure that their offsets are credible and legitimate. Bureau Veritas supports this by assessing carbon offset and removal from operations verifying that it matches a company's net zero roadmap. We leverage the UNFCCC Clean Development Mechanism to offer project design validation and verification services. This helps clients meet the requirements of approved schemes like the Verified Carbon Standard and Gold Standard.

Thanks to these verified emission reductions, mining companies can demonstrate the integrity of their offsetting projects and support credible progress toward net zero.



Developing carbon capture and storage

Another solution for offsetting emissions is carbon capture and storage (CCS) technology. Energy companies already account for more than a third of investment in CCS projects, and about 75% of CO₂ captured comes from oil and gas operations⁹. Offshore assets offer their own possibilities for storing carbon, by injecting CO₂ into decommissioned jackets or topside facilities. Bureau Veritas provides both feasibility studies for onshore projects and integrity inspections for offshore jackets, using OPEX and CAPEX data to support decision-making.

⁸. This process is known as insetting, and can help reduce Scope 3 emissions
⁹. <https://www.iea.org/reports/the-oil-and-gas-industry-in-energy-transitions>



COMMUNICATE AROUND BUSINESS CLAIMS

Once companies have measured and monitored their emissions reduction and improved data reliability, they need to communicate their progress to both stakeholders and society at large. By verifying all collected emissions reduction data with an independent third party, companies can provide proof of their efforts and progress toward achieving net zero.

Companies working toward net zero should expect to undergo regular carbon footprint assessment, reporting and verification. This may be required by regulations, but is also expected by other stakeholders, including investors, clients and consumers.

Bureau Veritas helps clients ensure their communications around emissions reduction are thorough and precise. We can assist with reporting index selection, including the **Carbon Disclosure Project (CDP)**, the **Task Force on Climate-Related Financial Disclosures (TCFD) framework**, and the **Global Reporting Initiative (GRI)**, WBCSD GHG protocol, ISO 14064, SBTi Net Zero standards.

Carbon progress certification

Bureau Veritas has developed a certification and labeling scheme that enables organizations to demonstrate their progress towards decarbonization. Improvements reduction clients have achieved and their trajectory toward meeting the science-based targets established for their industry.

As an independent third party, Bureau Veritas can also provide verification of sustainability reporting, ensuring a comprehensive and accurate picture of a company's environmental footprint. We help clients prove that the organization, processes and practices behind their business ventures are socially responsible and sustainable.

Bureau Veritas provides clients with clear, reliable and verified information thanks to our industry-specific expertise, field experience, project management skills, local presence, and verification and certification services. We put a trusted stamp of approval on companies' sustainability results, enabling clients' to communicate transparently about their progress toward net zero. By facilitating responsible communications, we support companies as they seek to build lasting trust with stakeholders, partners and consumers.



YOUR PARTNER IN VALUE CREATION

Achieving Net Zero solution is a flexible, dynamic, integrated digital solution that enables clients to set and reach the GHG emissions reduction targets most suited to their business and situation. This includes achieving net zero at the pace and by the date of their choice. Our modular solution comprises three levels of compliance.

A MODULAR SOLUTION TO MEET THE NEEDS OF EVERY COMPANY

1

Compliance and **VERIFICATION**

Allows companies to verify that their data is compliant with standardized principles and approaches for reducing GHG emissions, including all relevant policies and regulations

2

Compliance and **IMPROVEMENT**

Enables organizations to compare their activities to common, industry-specific GHG emission practices and improve data reliability to more accurately identify hotspots

3

Compliance and **DEVELOPMENT**

Empowers clients to discover and implement verified GHG emission best practices to increase data reliability and accelerate progress toward net zero, reducing emissions, limiting production costs and mitigating carbon tax exposure

GOING BEYOND SUSTAINABILITY

With years of experience and a worldwide network of experts, Bureau Veritas is the partner of choice for companies looking to make the transition to net zero. Our integrated solution and far-reaching industry know-how enable mining & metals companies to reap all the benefits of achieving net zero. We help companies go beyond compliance and improving sustainability, enabling them to take advantage of a host of additional benefits, including greater efficiency, reduced costs, lower taxes and improved operations.



Our Green Line of services and solutions enables clients to meet sustainability challenges, protecting the environment and improving the quality of products and services across the value chain. We are a key player in the energy transition, present at all stages of the renewable and alternative energy production chain. **The BV Green Line** helps organizations implement, measure and achieve sustainability objectives, and enables us to support our clients in sustainably designing, building and operating their assets.



Increase
energy
efficiency



Improve
asset
management



Create
value for
stakeholders



Reduce
costs from operations
and maintenance



Prepare
for carbon tax
legislation



Build
a clean
mining sector



Apply
industry expertise
to a global challenge



SHAPING A WORLD OF TRUST

Bureau Veritas is a Business to Business to Society company, contributing to transforming the world we live in. A world leader in testing, inspection and certification, we help clients across all industries address challenges in quality, health & safety, environmental protection and social responsibility.

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