COLUMBIA CLIMATE SCHOOL
COLUMBIA CENTER ON SUSTAINABLE INVESTMENT

VALE

Event Summary | *Mining Together: Nature, People and Just Transitions*

As part of New York Climate Week 2025, the Columbia Center on Sustainable Investment (CCSI) and Vale Base Metals convened the roundtable, *Mining Together: Nature, People, and Just Transitions*, as the first event in a series reimagining the mining sector's potential for responsible land management. The roundtable gathered industry, policy, NGO, and research stakeholders to explore how nature-based solutions (NbS) and circular economy approaches can advance biodiversity, community well-being, and climate resilience. Discussions focused on practical strategies for integrating land-use planning with ecological and social goals, lessons from real-world NbS design and implementation, and pathways for ensuring long-term value beyond mine closure. This briefing summarizes the main takeaways and emerging themes from the roundtable, which will inform the dialogue in the series' second event at COP 30 in Belém.

I. Main Takeaways

Mining's Role: Reimagining Land Management

Mining companies have a unique opportunity to turn expected negative externalities into beneficial environmental and social outcomes. Realizing this potential requires broadening conceptions of responsible land management beyond harm reduction and compliance, and moving towards a holistic approach to stewardship that actively supports ecological recovery and community well-being. Participants highlighted some elements of effective stewardship, including embedding nature-positive thinking throughout the mining lifecycle, especially during project planning; co-designing solutions with communities to meet their needs and promote shared benefits; and embedding Indigenous people and Local Communities' (IPLC)'s knowledge into all nature-positive solutions. Moreover, companies may consider asset transfers to governments or communities after closure to ensure land is responsibly managed beyond project time scales. Successfully reframing mining's role in practice will also depend on the support of a broader ecosystem of actors, including governments, investors, and civil society. Yet, mining companies themselves can be powerful catalysts for this shift, thanks to their deep national presence and their ability to convene diverse stakeholders around shared projects.

Government's Role: Enabling Policy Frameworks

Governments hosting mining operations have an essential role in creating policies and conditions that enable nature-positive outcomes. Governments can align company behavior with environmental and social objectives through the implementation of standards, contracts, and permits.

Case Study: Biodiversity Net Gain (BNG) legislation in the United Kingdom.

Beginning in 2024, development projects in the UK are legally required to deliver a quantifiable increase in biodiversity value compared to pre-project conditions. This policy, which centers ecological outcomes over method (e.g. requiring a 10% net gain in biodiversity rather than planting a number of trees), appoints independent bodies to oversee the long-term management of these initiatives and ensure their implementation.

Developers must draft biodiversity net gain plans that are approved by local planning authorities (LPA) before the project may begin. During the project, LPAs and other national bodies (including Natural England and Defra) monitor the implementation of these plans, ensuring the presence of a regulatory force throughout the development process. There are some concerns about whether LPAs have the resources to effectively maintain monitoring efforts long-term, especially as the majority of BNG agreements rely on developers to follow through on their commitments.

However, the legislation empowers regulators: LPAs may charge developers monitoring fees that are associated with monitoring and reporting; moreover, it is within their rights to implement the BNG at the cost of the developer in instances where the developer does not fulfill their obligation. The legislation's emphasis on the power of enforcers reflects the important role government plays in ensuring the implementation of environmental initiatives.

Finance's Role: Aligning Capital with Nature

Finance is also an important lever for scaling NbS, yet funding security remains a significant barrier to their implementation. Participants raised the importance of incorporating nature-related risks into financial decision-making, agreeing that a stronger understanding of the financial risks posed by nature loss could support harm avoidance. Among the potential mechanisms mentioned were a nature risk premium, imposed by financiers, in which projects that pose greater risk to nature face a higher cost of capital and are more difficult to finance, thereby incentivizing better environmental practices.

Participants also noted biodiversity compensation markets — such as those in the UK's BNG — which require developers to offset biodiversity losses by funding or developing biodiversity gains elsewhere. Voluntary carbon markets, such as REDD+, similarly provide financial incentives for nature conservation and assist in more effectively pricing temporal and ecological risk. Participants, however, recognized the limitations of these mechanisms, given that (a) compensation can only be a last resort and cannot substitute for robust avoidance efforts; (b) using biodiversity credits for offsetting would net biodiversity loss, not create "net gain"; (c) there is no agreed metric for biodiversity comparable to "CO2 equivalent", and simplified proxy metrics risk misrepresenting ecological diversity.

Dedicated financing solutions could help mobilize capital for nature-positive projects. These may include nature-linked bonds or other debt instruments, trust funds jointly financed by several mining companies, and legally mandated mine-closure funds provisioned throughout the mine's life. However, without mandatory regulation, progress toward conserving and restoring nature will remain slow, hindered by fragmented action across the financial sector and difficulties in valuing nature-related risks. Regulatory compliance remains the main driver for conservation and restoration measures, especially given the inherent complexity of biodiversity. Therefore, it is essential that financing tools do not erode existing legal protections in domestic and international environmental law, and legitimize harmful practices, such as biodiversity credits for offsetting purposes.

Designing Effective NbS

Participants identified a number of elements conducive to successful NbS design.

Strong data collection and sharing was seen as important for facilitating stakeholder collaboration, fostering transparency, and designing more informed NbS. In one instance, data collection proved essential when it led a company to discover a protected species inhabiting a potential mining site. As a result of data sharing, the company and local community worked in conjunction to identify and designate potential conservation areas from the onset of operations.

Including *NbS design from the early stages of the mining lifecycle* is also crucial, as contract negotiation, environmental impact assessments, mining design, and mining development will determine how companies can avoid negative impacts and maximize benefits to be gained from NbS.

Successful *NbS must also be tailored to context-specific conditions.* Participants noted that NbS often fail when projects are implemented without knowledge of local contexts and are thus unable to articulate benefit-sharing. This unfamiliarity with the operating environment sets companies up for inconsistent and uninformed approaches to NbS implementation. However, participants noted that the importance of site-specific approaches may also make it difficult to identify universal standards for NbS.

Community Collaboration and Co-creation

Participants emphasized that successful NbS require community consultation and engagement. Because mining companies' objectives and IPLC needs are not always aligned, co-design and co-management of NbS are essential for building resilient and equitable initiatives. Collaborating with communities from the beginning of a project strengthens buy-in and ensures benefit sharing between mining companies and affected communities. Mining companies should emphasize and prioritize the social benefits of NbS, including generating income, job opportunities, education, and air and water quality.

Models of IPLC engagement may evolve over time but should focus on resourcing and empowering communities to engage in the design, implementation, and maintenance of NbS. Participants pointed to examples where sustained and active community engagement at a legacy mining site enabled the mining company to effectively remediate negative mining impacts — in this case, water quality and wetland restoration — in support of local livelihoods. These examples highlighted that in instances where communities were included early on, the goals of NbS were more precise and thus the outcomes were more positive. Crucially, participants also noted that the effectiveness of community engagement depends on community capacity and proactivity, which underscores the importance of investing in capacity building to ensure the best outcomes.

II. Challenges

Ambiguity of Mining Boundaries

Participants repeatedly highlighted that one of the biggest barriers to implementing NbS in the mining context is the spatial and temporal ambiguity of mining sites. Because mining projects often operate on long timelines that outlast governments, it can be difficult to implement policies and frameworks that ensure continuity, accountability, and alignment of mining with nature-positive practices. Similarly, at the mining companies' level, institutional memory can be complicated over long timescales.

In addition to difficulty enforcing NbS over prolonged timescales, it can be challenging to define the geographic boundaries of a company's responsibility because the active mining site may only be a portion of a larger land area impacted by mining activities. Participants emphasized that the land surrounding mining operations, which may be impacted by leakage, complicates understandings of impacted communities.

Thus, because the effects of mining can extend past extraction zones and persist after closure, one of the challenges in designing lasting NbS is accounting for and distinguishing responsibility across diffuse spatial and temporal scales. These challenges highlight the importance of integrating a landscape-level approach in planning NbS to ensure interventions account for downstream and cumulative impacts and support holistic ecosystem recovery.

"Nature-positive" Frameworks

There was general consensus on the importance of achieving nature-positive outcomes in mining. However, the absence of a shared definition or standardized accounting framework hinders its usefulness, as does the ambiguity surrounding the appropriate time scale for defining "nature positive". As a result, many discussions remain focused on avoiding harm rather than proactively pursuing social benefits and ecological regeneration.

While most mining companies acknowledge the importance of advancing nature-positive outcomes, participants noted that firms are often reluctant to lead these efforts independently. Collective, industry-wide initiatives may be more effective in setting ambitious standards, mobilizing resources, and signaling commitment to governments and investors.

NbS are increasingly recognized across disciplines, from finance to engineering, as a practical mode of operationalizing nature-positive goals. However, many of the challenges to successful application are familiar, particularly those pertaining to meaningful community engagement and practical implementation.

NbS in mining have tremendous potential to create business value while supporting conservation and social goals. When effectively designed, NbS can offer tangible benefits to mining operations and stakeholders, including enhancing ecosystem services, strengthening relationships with IPLC, reducing long-term environmental liabilities, and supporting climate commitments. Realizing this potential will require stronger interdisciplinary collaboration to bridge the knowledge and disciplinary gaps between the stakeholders and experts.

Since the full range of ecosystem functions remain only partially understood, attempts to quantify nature's value should be treated with caution. Nature should be conserved, restored, and sustainably managed regardless of whether it presents a compelling business case. For this reason, a combination of policy, regulatory, private and public finance is critical, and it remains essential to involve diverse competencies in the planning and design of NbS to realize the full potential of their application in mining.

Follow-up Questions and Next Steps

- What does it look like to implement value-chain wide NbS? What are models of collaboration between downstream actors and mining companies that enact these initiatives across the value-chain?
- What is needed to make a shift towards NbS at the sector level? Rather than at the firm level?
- What are metrics and partnerships that can be used to assess NbS at the landscape or system level?
- How can mining activities create genuine opportunities for IPLC?
- Where do mining companies see the biggest NbS-related opportunities and where is the most hesitance?

These remaining questions will frame the dialogue of our upcoming events at COP 30 in Belém, where we seek to drive the conversation from commitment to practical action.