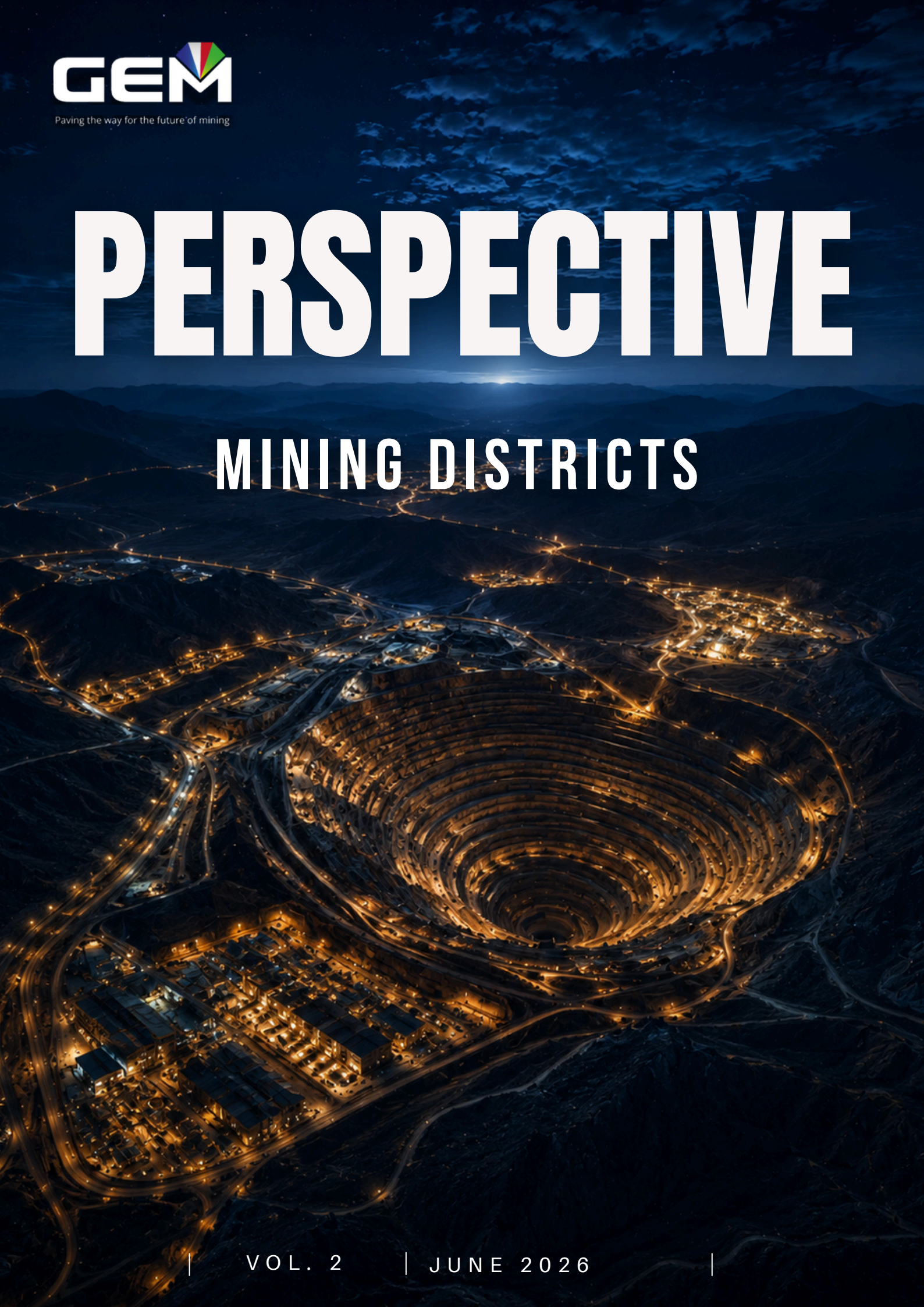
GEM

Paving the way for the future of mining

PERSPECTIVE

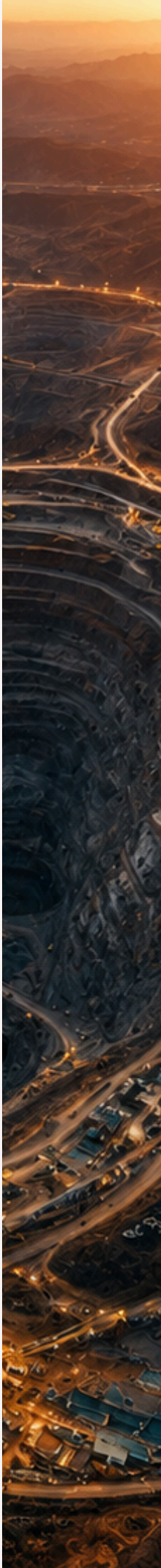
MINING DISTRICTS



VOL. 2 | JUNE 2026

INDEX

VOLUME 2
June 2026



ABOUT GEM

We are an Industrial Engineering company specialized in supporting the mining industry in management and economic matters. With over **16 years of experience** and the successful implementation of more than **500 projects worldwide**, we stand out for our strong track record and commitment to excellence in the sector.
GEM leads the future of mining with innovative solutions.

From climate change management to deep-sea mining and in-situ leaching, GEM is committed to promoting sustainable, collaborative, and responsible practices, always with a focus on social and environmental impact.

Climate Change

Collaboration

Data Science

Decarbonization

Social Impact Assessment

Nature

Deep Sea Mining

Space Mining

In Situ Leaching

EDITORIAL

BY ISAAC PAREDES
CHIEF OPERATING OFFICER

Mining is at a decisive moment. Demand for strategic minerals continues to grow, driven by electrification, the energy transition, and technological development. However, developing new supply is becoming increasingly complex. Assets are more mature, environmental requirements are more demanding, and the territories in which we operate call for more sophisticated and collaborative forms of engagement.

In this context, we believe that **one of the most relevant questions for the industry is no longer how much value an individual mine can generate on its own, but how much additional value can be captured when multiple operations are understood as part of a single system.**

For decades, many strategic decisions have been made from the perspective of the mine as an isolated asset. Today's reality, however, shows us that many of the most significant opportunities lie in the ability to share infrastructure, coordinate investments, optimize common resources, and manage territorial constraints in an integrated way. **Geographic proximity alone does not create value; value is created when that proximity is transformed into a platform for collaboration and development.**

This reflection inspired the work presented in this second edition of Perspectiva. Our objective was to explore the extent to which the world's leading mining districts have the necessary conditions to capture value jointly and sustainably. To do so, we developed the District Potential Value Index (DPVI), a tool designed to provide a comparative and strategic perspective on the opportunities offered by a district-based approach.

The results confirm something that many industry stakeholders already perceive intuitively: the most attractive districts are not necessarily those with the highest concentration of operations, but those where economic scale, coordination capacity, enabling infrastructure, and social and environmental conditions converge to support long-term development.

Cases such as Collahuasi–Quebrada Blanca, Andina–Los Bronces, and Codelco's Northern District in Chile show how a district-based logic can become a concrete source of competitiveness and resilience. However, this opportunity is not exclusive to the Chilean context.

Internationally, districts such as Lubin–Polkowice Sieroszowice–Rudna in Poland, Salar de Olaroz–Cauchari Olaroz in Argentina, and Altura–Pilgangoora in Australia/New Caledonia show that district-level value creation can also be observed across different geographies, commodities, and levels of operational maturity. In all these cases, the potential does not arise solely from the proximity between assets, but from the combination of economic scale, enabling infrastructure, operational continuity, and the conditions required to coordinate decisions at the territorial level.

At GEM, we hope this edition contributes to that discussion and provides useful insights for strategic decision-making. Because in an industry where developing new supply is becoming increasingly difficult, the difference between success and a missed opportunity may lie in the ability to transform proximity into value.

INTRODUCTION

Contemporary mining faces an increasingly evident tension: demand for strategic minerals continues to rise, but the ability to generate new supply depends on increasingly complex territories, more mature assets, higher environmental requirements, and a more sophisticated social relationship with communities and the State. In this context, the traditional approach of evaluating projects in isolation is insufficient. **Mining competitiveness no longer depends solely on the quality of an individual mine, but on its ability to integrate with other assets, share critical infrastructure, reduce common constraints, and capture value at a territorial scale.**

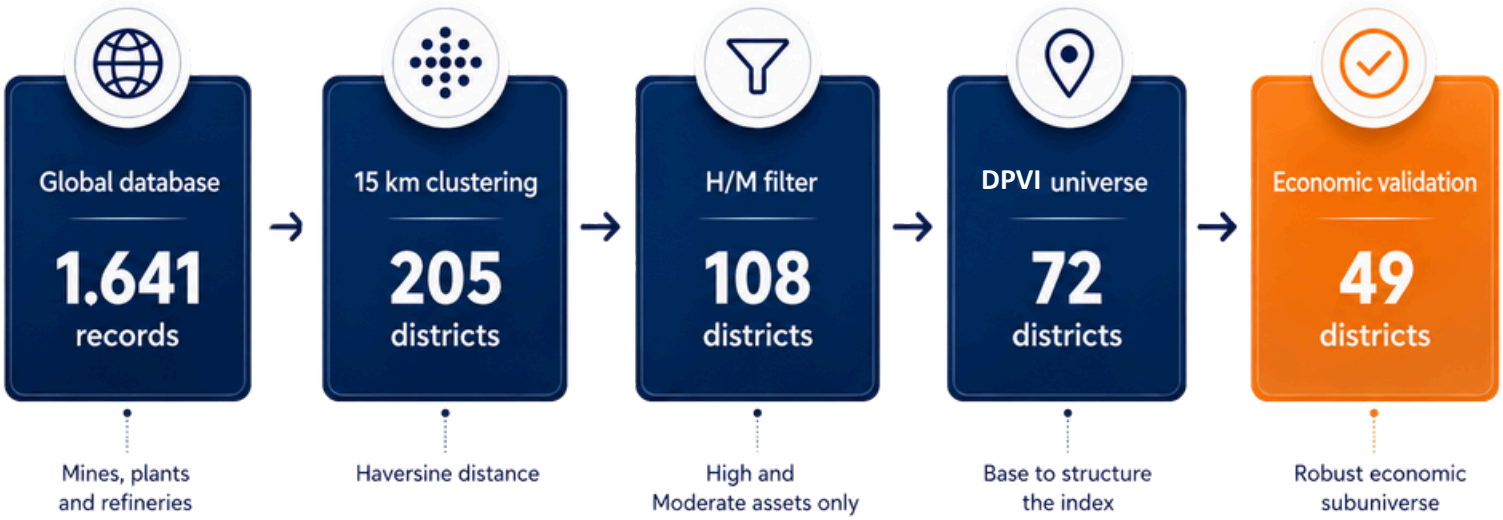
From this perspective, the concept of a mining district becomes strategically relevant. **A district is not simply a set of nearby operations.** It is a territorial configuration in which geographic proximity can be transformed into economic value when there is sufficient critical mass, operational compatibility, corporate coordination, social continuity, and adequate environmental conditions. **Proximity alone does not guarantee synergies; it only opens the possibility of building them.**

.

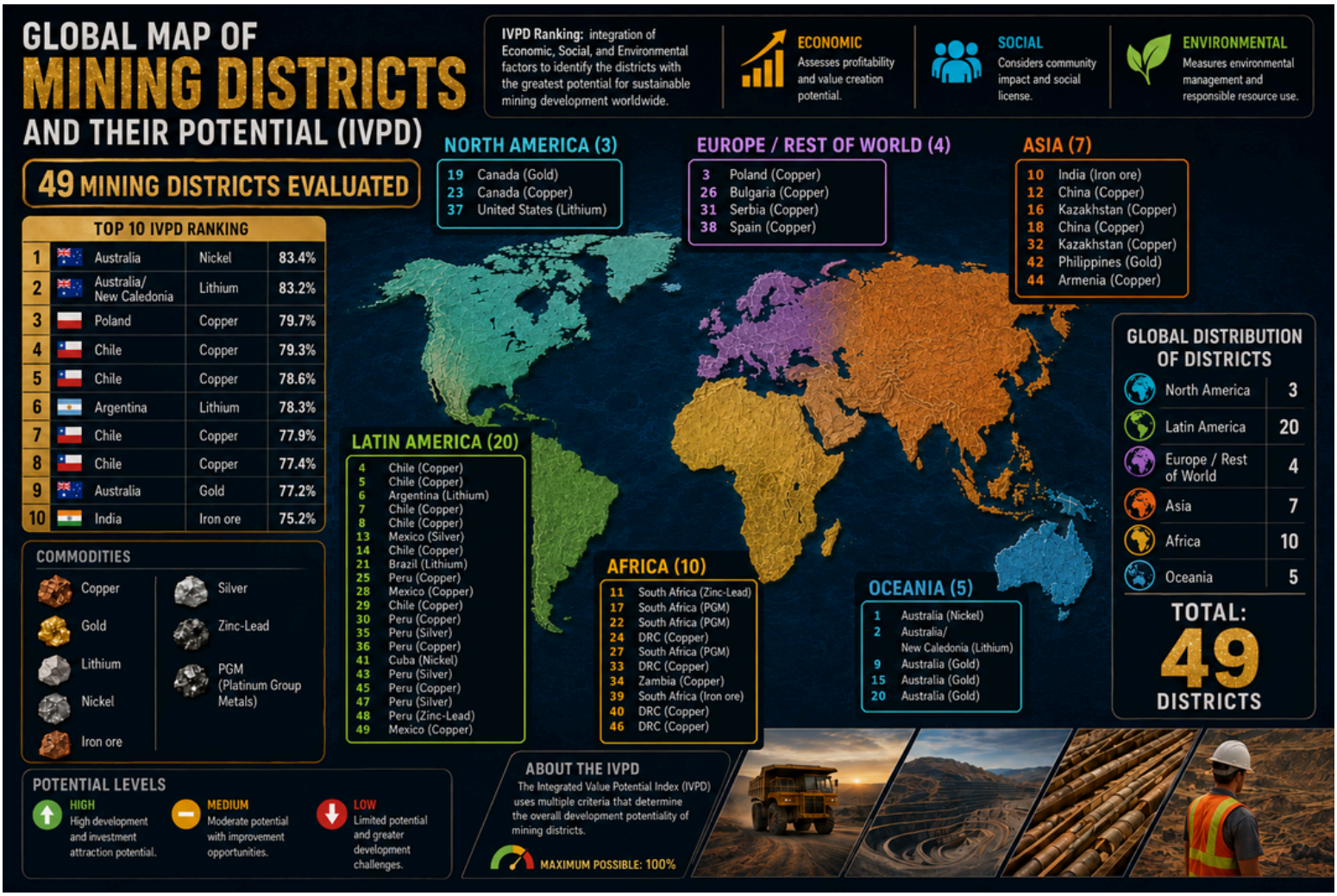
The economic dimension represents 50% of the index and seeks to capture the district's capacity to generate and capture value, incorporating variables such as economic contribution, District Corporate Receptivity (DCR), operating synergy, and corporate coordination. The social and environmental dimensions, each weighted at 25%, assess the district's continuity conditions, considering the institutional environment, public conflict, water risk, territorial sensitivity, and environmental enablement. **The objective is not to declare the absolute viability of each district, but to distinguish those with greater relative potential to generate, capture, and sustain value over time.**

The analysis begins with a global base of 1,641 operating mines and mining projects and advances through successive filters of distance, reliability, and information availability until consolidating a final sample of 49 districts and 113 mining operations and projects with sufficient traceability. This transition from a broad universe to a validated portfolio is essential: it allows the analysis to move from an initial geographic reading to a strategic assessment based on comparable information.

FIGURE 1. EVOLUTION OF THE SAMPLE AND MAIN METHODOLOGICAL FILTERS



Source: GEM, prepared by the authors based on public data



Source: GEM, own elaboration based on public data

One of the most relevant findings of the analysis is that the index recognizes as high-potential districts configurations that the industry itself already understands, in practice, as consolidated mining systems or systems in the process of consolidation. This signal is not limited to Chile; it also appears in other geographies and commodities. Internationally, District 72, composed of Lubin, Polkowice Sieroszowice, and Rudna in Poland, reaches a DPVI of 79.7 points and is positioned within the highest-potential group in the portfolio. This result is particularly relevant because it reflects the strength of a copper system with high scale, operational continuity, and a recognizable district logic, where proximity among assets is combined with favorable conditions to capture value in an integrated way.

The same consistency is observed in other international districts in the ranking. District 51, composed of Salar de Olaroz and Cauchari Olaroz in Argentina, obtains a DPVI of 78.3 points, positioning it as a relevant district opportunity associated with lithium. Its position within the leading group shows that the index not only identifies mature copper districts, but also emerging configurations in critical minerals, where proximity, critical mass, and continuity conditions can become a platform for territorial growth. Meanwhile, District 35, composed of Altura and Pilgangoora in Australia/New Caledonia, reaches a DPVI of 83.2 points, the second-highest value in the integrated ranking, reinforcing the idea that the district logic can also be observed in systems associated with lithium, shared infrastructure, and operational consolidation.

The Chilean case complements this reading and shows that the DPVI also recognizes district configurations that are already evident to the local industry. Districts such as Collahuasi-Quebrada Blanca, Andina-Los Bronces, and Radomiro Tomic-Chuquicamata-Ministro Hales rank among the top positions in the integrated ranking, confirming that the combination of critical mass, existing infrastructure, operational continuity, social commitment, and coordination potential can transform geographic proximity into a real platform for value generation.

Taken together, these results provide a conceptual validation of the DPVI: the index does not merely group nearby assets; it identifies territories where district logic has concrete expression or potentially capturable value in productive scale, infrastructure, operational continuity, and strategic coordination. The international and Chilean evidence therefore reinforces the central thesis of the study: not every set of nearby assets constitutes an attractive mining district, and not every district with relevant resources is necessarily enabled to capture value. **District potential emerges when three conditions converge: a sufficiently robust economic base, an operational architecture capable of generating synergies, and a social-environmental context that allows activity to be sustained over the long term.** From this perspective, the DPVI does not seek to replace asset-specific technical studies, but rather to provide a comparative and strategic reading that distinguishes among consolidated districts, emerging opportunities, and clusters that require greater caution.

Accordingly, this Perspective proposes moving from a purely spatial definition of a district toward a strategic definition. **The relevant question is not only how many mines are located near one another, but which of those configurations have real conditions to share infrastructure, coordinate decisions, reduce operational frictions, capture economies of scale, and sustain their development amid increasing social and environmental constraints.** In a context where the industry needs to improve productivity, accelerate value capture, and use its infrastructure more efficiently, the district perspective ceases to be a descriptive category and becomes a concrete tool for long-term mining planning.

MOTIVATION: FROM THE ISOLATED MINE TO THE TERRITORIAL SYSTEM

The motivation for this study arises from a structural transformation in the mining industry. For decades, value analysis focused mainly on the individual mine: reserves, grade, production, costs, mine life, and expansion capacity. However, current pressure on water, energy, permits, tailings, logistics infrastructure, and territorial legitimacy requires expanding the unit of analysis. **In many cases, the true potential is not found in a stand-alone operation, but in the articulation among nearby assets.**

This logic is especially relevant in a scenario of mature assets and declining grades. As operations age, the capture of incremental value requires more integrated solutions: shared use of plants, water systems, energy, roads, tailings facilities, camps, specialized equipment, or technical capabilities. **The question is no longer only how much each mine is worth, but how much additional value can be captured when those mines are managed as part of a territorial system.**

Nevertheless, industry experience shows that not all geographic proximity becomes a district. Some territories have nearby assets but lack process compatibility, sufficient scale, consolidated ownership structures, or the social and environmental conditions needed to materialize synergies. Therefore, **the challenge is not to identify nearby mines, but to recognize where the district hypothesis is economically attractive and operationally capturable.**

In this sense, the DPVI seeks to provide an ordered answer to a decision question: where is it worthwhile to deepen a district thesis, and where is proximity among assets insufficient to justify an integration strategy? This question matters because the goal is not to determine how many mines are located close to each other, but which of those clusters have real conditions to become districts with capturable value. **Proximity can reduce distances, but it does not by itself solve operational compatibility, corporate coordination, water availability, environmental permitting, or social legitimacy.** Evaluating districts therefore requires looking simultaneously at economic value and territorial continuity.

To answer this question, GEM developed the District Potential Value Index (DPVI), a comparative tool that ranks districts according to their capacity to generate, capture, and sustain value. The index does not seek to predict the success of a district with certainty, but rather to provide a relative and traceable reading of its strategic potential compared with other mining territories.

METHODOLOGY: DISTRICT POTENTIAL VALUE INDEX (DPVI)

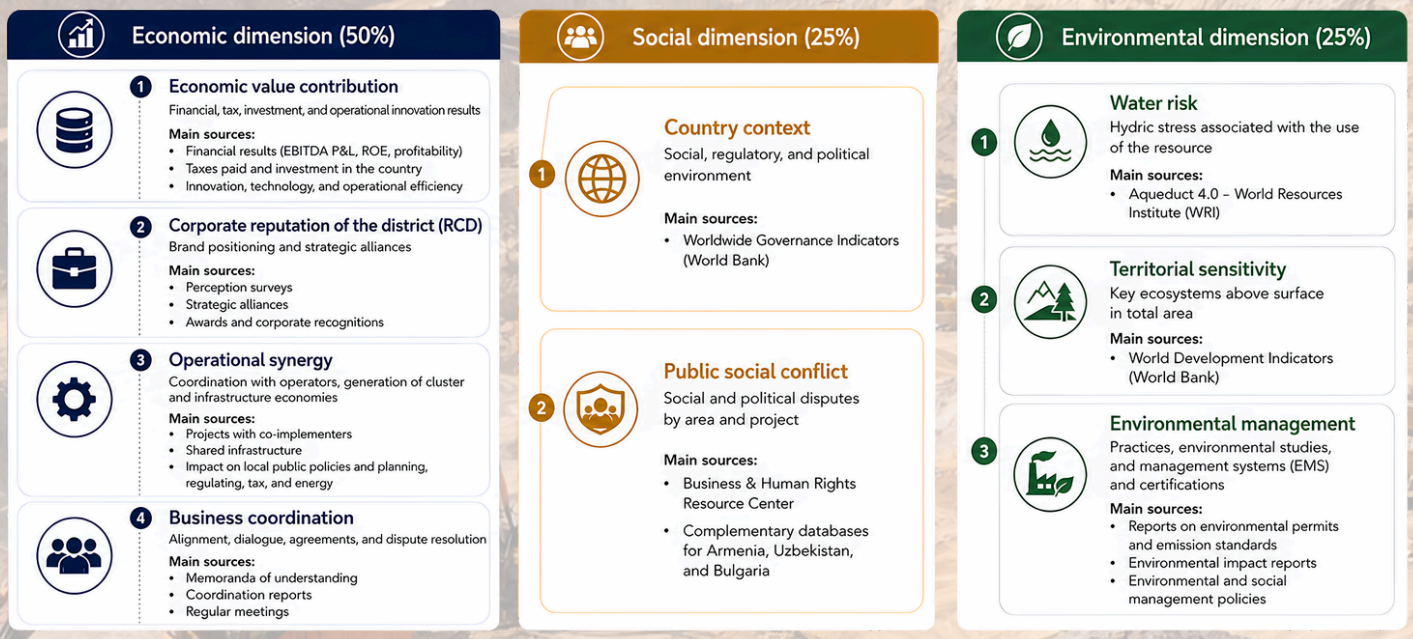
The DPVI is constructed as an integrated score from 0 to 100 that combines three weighted dimensions. The economic dimension represents up to 50 points and measures the district's capacity to generate and capture value. The social dimension contributes up to 25 points and assesses institutional conditions and public conflict. The environmental dimension also contributes up to 25 points and analyzes water, territorial, and permitting constraints.

This structure follows a simple logic: a district with high economic materiality may not be a priority if it faces social or environmental constraints that compromise long-term continuity. Likewise, a stable and enabled territory may not justify a district thesis if it lacks sufficient economic critical mass. **The index should therefore not be interpreted as a direct probability of success, but as a comparative measure of relative potential.**

The economic dimension distinguishes between intrinsic value and capture capacity. Intrinsic value is measured through reserves, resources, and annual production, normalized by commodity group. Capture capacity is approximated through three enablers: District Corporate Receptiveness (DCR), operating synergy, and corporate coordination. This distinction avoids an incomplete reading: a district may have great scale but low integration capacity, or favorable coordination conditions but an insufficient economic base.

The social and environmental dimensions function as continuity filters. An economically attractive district may be constrained if it faces high conflict, low institutional certainty, water restrictions, or permitting uncertainty. Conversely, a stable and environmentally enabled territory will not necessarily be a priority if it lacks sufficient economic base. **The strength of the DPVI lies precisely in crossing both planes.**

FIGURE 2. SUMMARIZES THE SOURCES USED TO ESTIMATE THE CONTRIBUTION OF EACH VARIABLE WITHIN THE DIFFERENT DIMENSIONS



Source: GEM, own elaboration

TABLE 1. DPVI ARCHITECTURE

DIMENSION	WEIGHT IN DPVI	WHAT ASSESSES	STRATEGIC READING
ECONOMIC	50%	Economic contribution, District Corporate Receptiveness (DCR), operating synergy, and corporate coordination	Size of the opportunity and capacity to capture value
SOCIAL	25%	Country environment and public social conflict	Institutional continuity, territorial legitimacy, and lower exposure to conflict
ENVIRONMENTAL	25%	Water risk, territorial sensitivity, and environmental enablement	Physical, permitting, and environmental restrictions to sustain or expand operations

Source: GEM (2026), own elaboration

GENERAL RESULTS: DISTRICT VALUE IS NOT ONLY IN GEOGRAPHY

The validated portfolio presents an average DPVI of 64.6 points out of 100, with a standard deviation of 10.5 points. This result suggests a competitive global base, but with relevant differences among districts. The first quartile is 57.0 points and the third quartile is 72.3 points, thresholds that allow low, medium, and high relative-potential districts to be distinguished.

The economic dimension is the main differentiating factor. Because it represents half of the index and shows the greatest dispersion among districts, it explains much of the gap between leading and lagging cases. In simple terms, **the districts with the highest DPVI are not only located in better environments; they also contain assets with greater scale, production, resources, and conditions to capture synergies.**

The social-environmental analysis functions as a second layer of interpretation. Districts with strong performance in both dimensions have better conditions to sustain operations, expand, or share infrastructure. By contrast, districts with mixed performance should be treated as conditional opportunities: they may have economic value, but require prior management of water, permits, conflict, territorial legitimacy, or institutional certainty.

TABLE 2. DESCRIPTIVE STATISTICS OF THE DPVI AND ITS DIMENSIONS

VARIABLE	N	AVG.	STD. DEV.	MIN	Q1 25%	MEDIAN 50%	Q3 75%	MAX
ECONOMIC DIMENSION	49	32,3%	8,0%	17,1%	24,9%	33,4%	39,3%	46,9%
SOCIAL DIMENSION	49	16,6%	3,6%	9,1%	14,5%	17,2%	18,8%	21,9%
ENVIRONMENTAL DIMENSION	49	15,7%	3,2%	8,6%	13,2%	15,7%	17,2%	22,9%
SOCIAL-ENVIRONMENTAL CONTINUITY	49	32,3%	5,4%	22,8%	27,4%	33,5%	37,0%	44,0%
TOTAL DPVI	49	64,6%	10,5%	42,0%	57,0%	64,7%	72,3%	83,4%

Source: GEM (2026), own elaboration

ECONOMIC DIMENSION: SCALE EXPLAINS THE FIRST HALF OF THE STORY

The economic dimension reaches an average of 32.3 points out of a theoretical maximum of 50. **The most relevant reading is that the main source of differentiation is not in the synergy enablers, but in economic contribution.** This variable, constructed from reserves, resources, and production, shows the greatest dispersion in the portfolio and clearly separates districts with critical mass from those that depend on a future growth thesis.

This dimension shows that the main difference among districts is not only the existence of synergies, but the magnitude of the value that can be captured. Leading districts combine resources, reserves, production, and sufficient coordination conditions to transform proximity into economic opportunity. Lagging cases show that **geographic proximity loses relevance when there is no critical mass to justify an integration strategy.**

Oceania leads the economic dimension with an average of 39.0 points. Its result is not explained by a single attribute, but by the combination of high economic contribution, above-average operating synergy, and corporate coordination close to the theoretical maximum. In other words, Oceania's districts not only contain relevant assets; they also present better conditions to transform scale into capturable value.

Latin America, Africa, Asia, and the Rest of the World are close to the portfolio average, although with different internal compositions. In Latin America, Chilean copper districts and Argentine lithium districts raise the regional average, while several cases in Peru and Mexico appear more constrained by lower economic contribution or by social and environmental restrictions. North America shows a different reading: it has good enabling conditions, but lower relative economic value under the current sample.

This evidence supports an important strategic message: a territory can be stable, institutionally robust, or environmentally favorable, but it will not necessarily be a priority for district value capture if it lacks sufficient economic base. Stability enables; scale justifies.

TABLE 3. ECONOMIC DIMENSION BY CONTINENT

CONTINENT	# DIST.	AVG. CONTRIBUTION	AVG. DCR	AVG. OP. SYN.	AVG. CORP. COORD.	AVG. ECON. DIM.
Oceania	5	16,8%	4,2%	8,0%	10,0%	39,0%
Latin America	20	12,0%	5,3%	6,3%	9,1%	32,7%
Rest of the World	4	11,2%	5,2%	5,9%	9,7%	32,1%
Africa	10	9,3%	5,2%	7,9%	9,4%	31,8%
Asia	7	9,3%	5,6%	7,5%	9,2%	31,6%
North America	3	3,9%	3,3%	5,2%	10,0%	22,4%
Total portfolio	**49**	**11,0%**	**5,1%**	**6,9%**	**9,4%**	**32,3%**

Source: GEM (2026), own elaboration

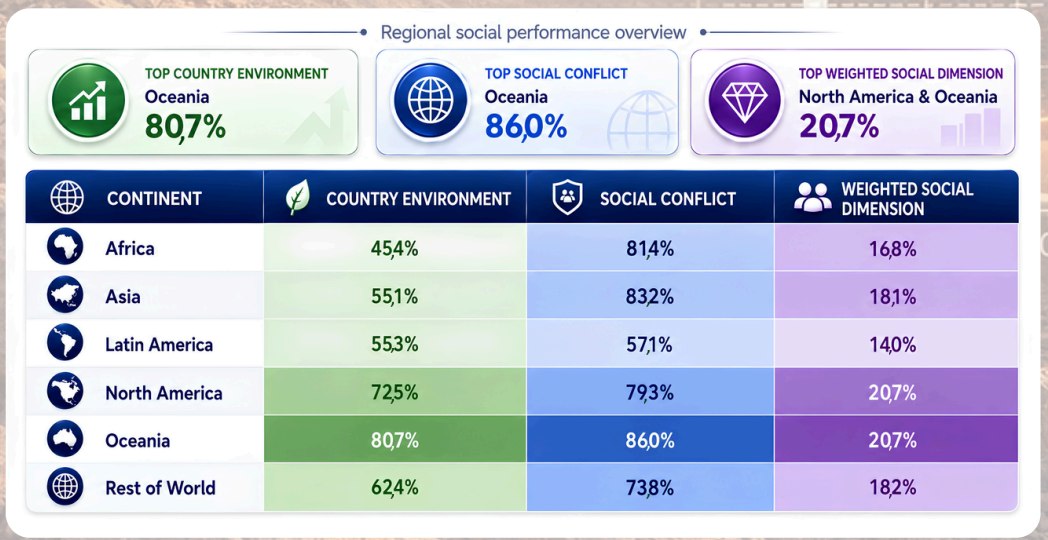
SOCIAL DIMENSION: INSTITUTIONAL CONTINUITY AND TERRITORIAL LEGITIMACY

The social dimension has an average close to 16.6 points out of 25. Its purpose is to measure enabling conditions for operational continuity, permits, territorial engagement, and long-term value capture. Unlike the economic dimension, which discriminates by scale, **the social dimension identifies where the institutional environment and public conflict can facilitate or restrict the materialization of synergies.**

Oceania and North America show the best average social performance, supported by stronger institutional environments and lower relative conflict. Asia and Africa occupy intermediate positions, while Latin America shows the lowest relative average, mainly due to higher exposure to public conflict in some countries in the sample.

Social conflict is especially relevant because it is not distributed homogeneously. Countries with similar institutional conditions can have very different public conflict profiles. **The social score should therefore not be read only as a snapshot of the country, but as an approximation of the territory's capacity to sustain continuity, permits, and legitimacy at the district scale.**

TABLE 4. SOCIAL VARIABLES BY CONTINENT



CONTINENT	COUNTRY ENVIRONMENT	SOCIAL CONFLICT	WEIGHTED SOCIAL DIMENSION
Africa	45,4%	81,4%	16,8%
Asia	55,1%	83,2%	18,1%
Latin America	55,3%	57,1%	14,0%
North America	72,5%	79,3%	20,7%
Oceania	80,7%	86,0%	20,7%
Rest of World	62,4%	73,8%	18,2%

Source: GEM (2026), own elaboration

ENVIRONMENTAL DIMENSION: WATER, TERRITORY, AND PERMITS AS CONTINUITY FILTERS

The environmental dimension reaches an average close to 15.7 points out of 25. In this dimension, territorial sensitivity shows the best average performance in the portfolio, suggesting that the proportion of protected areas is not the main restrictive factor at an aggregate scale. In contrast, water risk and environmental enablement show greater dispersion and therefore greater capacity to differentiate districts.

North America leads the average environmental performance, mainly because of favorable water conditions in Canada. Oceania, Latin America, and Asia occupy intermediate positions, while Africa presents a higher relative restriction associated with water risk.

This reading is important because it separates geological potential from capturable potential: **a district may have relevant resources, but if it faces severe water restrictions or low permitting certainty, its value should be evaluated more cautiously.**

In the district context, water and permits are not accessory variables. They are enabling conditions for sharing infrastructure, expanding capacity, extending mine life, or coordinating development sequences. Environmental performance should therefore be understood as a measure of strategic continuity, not only as a regulatory compliance indicator.

TABLE 5. ENVIRONMENTAL VARIABLES BY CONTINENT

GLOBAL ENVIRONMENTAL RISK OVERVIEW

A comparative view of key environmental risk and enablement factors across continents, expressed as percentage indices.

CONTINENT	WATER RISK	TERRITORIAL SENSITIVITY	ENVIRONMENTAL ENABLEMENT	WEIGHTED ENVIRONMENTAL
Africa	20,9%	83,1%	60,2%	13,2%
Asia	34,6%	86,5%	62,5%	14,6%
Latin America	44,1%	80,2%	72,5%	16,4%
North America	91,7%	86,4%	60,4%	20,0%
Oceania	78,8%	75,8%	40,4%	16,7%
Rest of World	72,2%	65,8%	41,7%	15,5%

Source: GEM (2026), own elaboration

INTEGRATED ANALYSIS: DISTRICTS WITH THE GREATEST VALUE-CAPTURE POTENTIAL

The integrated analysis of the DPVI should be read as a combination of the size of the opportunity and the capacity to sustain it. The economic dimension largely determines potential value, while the social and environmental dimensions condition the possibility of capturing it over time. **Districts with the highest DPVI are therefore not necessarily those without risks, but those where economic value is sufficiently high and continuity restrictions do not block the district thesis.**

The leading districts are concentrated in Australia, Chile, Australia/New Caledonia, Poland, and Argentina. The ranking shows a relevant signal: the DPVI recognizes territories where the industry already observes, in practice, a district logic.

The position of Chilean districts within the integrated ranking is a relevant signal. Cases such as Collahuasi-Quebrada Blanca, Codelco's Northern District, and Andina-Los Bronces appear well positioned not only because of their indicators, but because they represent territories where district logic is already recognizable in mining practice: scale, infrastructure, operational continuity, and coordination potential.

From a strategic perspective, **the ranking should not be understood only as a list of positions, but as a tool to distinguish among three types of situations:** consolidated districts, where the challenge is to deepen synergy capture; emerging districts, where potential exists but enablement is still required; and clusters of nearby assets that do not yet reach sufficient scale or continuity to sustain a robust district thesis.

TABLE 6. TEN LEADING DISTRICTS BY DPVI

Ranking	District	Main assets	Commodity	Country	Economic	Social + Environmental	DPVI
4	D44	Collahuasi; Quebrada Blanca	Copper	Chile	42,1%	37,2%	79,3%
5	D45	Andina; Los Bronces	Copper	Chile	41,4%	37,2%	78,6%
6	D51	Salar de Olaroz; Cauchari-Olaroz	Lithium	Argentina	40,9%	37,4%	78,3%
7	D47	Radomiro Tomic; Chuquicamata; Ministro Hales	Copper	Chile	40,7%	37,2%	77,9%
8	D46	Escondida; Zaldívar	Copper	Chile	40,2%	37,2%	77,4%
9	D36	Cadia Hill; Ridgeway	Gold	Australia	41,7%	35,6%	77,2%
10	D28	JSW Steel Devadri Mine; JSW Steel Nandi Mine	Iron ore	India	46,4%	28,8%	75,2%

COMMODITY LEGEND

Nickel | Lithium | Copper | Gold | Iron ore

Source: GEM (2026), own elaboration

TERRITORIAL READING: WHERE POTENTIAL IS CONCENTRATED

Oceania represents the clearest case of favorable balance between economic value and enabling conditions. Its leadership does not come from being the most favorable region in every indicator, but from combining a robust economic base with strong social performance and environmental restrictions that do not undermine the value thesis. This is precisely the logic of the DPVI: identifying districts where restrictions exist, but do not dominate the capture potential.

Chile stands out within Latin America because several of its copper districts are in the highest-priority group. This signal is relevant because it matches an industrial intuition: northern Chile not only concentrates major operations, but also mining systems with infrastructure, operational continuity, and long-term district vocation. The challenge is not to prove that these territories are important, but to quantify how capturable their value is in the face of restrictions related to water, permits, coordination, and social continuity.

Argentina is well positioned among lithium districts, especially because of the combination of economic contribution and environmental performance. However, its prioritization should be read under a logic of conditional opportunity: the economic potential of lithium is evident, but its capture will depend on sustaining regulatory, social, and water conditions compatible with accelerated

North America offers a different reading: it has high social and environmental continuity, but lower relative economic value under the current sample. **This demonstrates that a stable environment is a necessary but not sufficient condition.** To become a district priority, the region would need to strengthen its economic base through resource growth, asset reactivation, infrastructure consolidation, or the incorporation of nearby new operations.

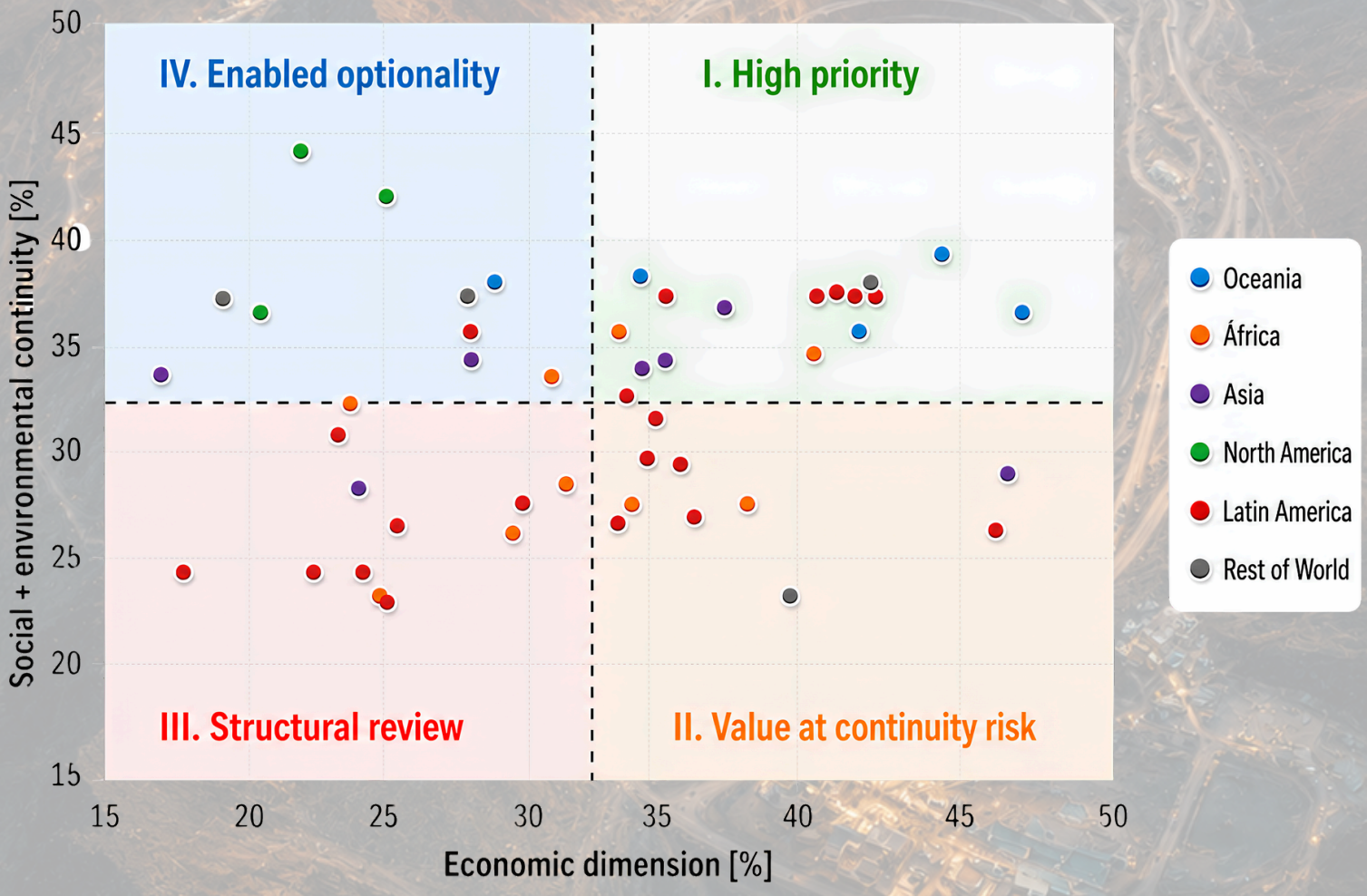
Africa, for its part, should not be interpreted as a low-potential region, but as a region of conditioned potential. Some districts show relevant scale and synergies, but water risk, infrastructure availability, and environmental traceability reduce their integrated potential. In these cases, the strategic focus should incorporate enabling investments before assuming that geological scale will automatically translate into capturable value.

TABLE 7. STRATEGIC READING OF THE DPVI MATRIX

QUADRANT	DEFINITION	STRATEGIC READING
I	High economic value and high social-environmental continuity	Highest-conviction districts. They justify studies on integration, shared infrastructure, and synergy capture.
II	High economic value and low social-environmental continuity	Attractive but conditioned value. They require prior management of water, permits, legitimacy, or conflict.
III	Low economic value and low social-environmental continuity	Lower relative priority. They require an explicit improvement thesis before remaining in the portfolio.
IV	Low economic value and high social-environmental continuity	Enabled territories, but with lower critical mass. They may gain attractiveness through exploration, M&A, or asset reconfiguration.

Source: GEM (2026), own elaboration

FIGURE 3. DPVI PRIORITIZATION MATRIX



Source: GEM (2026), own elaboration

STRATEGIC IMPLICATIONS FOR THE MINING INDUSTRY

The first implication is that the concept of a district should not be evaluated solely by geographic proximity. **Proximity among operations is a necessary condition to explore synergies, but not sufficient to capture them.** Value capture requires economic scale, operational compatibility, governance, permits, access to critical resources, and territorial legitimacy.

The second implication is that **the DPVI makes it possible to prioritize action.** Districts located in the highest-conviction quadrant should concentrate the first wave of integration studies, shared infrastructure, coordinated expansion, and portfolio optimization. By contrast, districts with high economic value but low continuity should be treated as conditional opportunities: they are not discarded, but their prioritization depends on resolving specific restrictions.

The third implication is that **the social and environmental dimensions should not be incorporated at the end of the analysis as compliance variables.** In a district logic, they are part of the value design. Permits, water, territorial engagement, and public legitimacy determine whether a technically possible synergy can be materialized in practice.

The main contribution of the approach is not to produce a ranking, but to differentiate decision types. Some districts justify immediate integration studies; others first require resolution of water, permit, or legitimacy constraints; and a third group needs to confirm whether sufficient economic value exists before moving forward. In this sense, the DPVI turns the concept of a district into a strategic prioritization tool.

Finally, the study distinguishes among consolidated, emerging, and apparent districts. Consolidated districts already show sufficient scale, infrastructure, and coordination; emerging districts have potential but require enablement; and apparent districts share only geographic proximity without a clear base for value capture. **This differentiation is central to avoiding map-based decisions and moving toward decisions based on strategic potential.**

CONCLUSIONS

The main conclusion of this Perspective is that the potential success of a mining district does not depend solely on proximity among assets. Proximity is the starting point, but value capture requires a more demanding combination: economic scale, operational compatibility, corporate coordination, social continuity, permits, access to water, and sufficient environmental conditions.

From this perspective, the DPVI makes it possible to move from a spatial definition of district to a strategic definition. Leading districts are those where geography becomes a real platform of value; lagging districts show that proximity without scale, enablement, or continuity is insufficient to justify a district strategy.

The analyzed portfolio presents an average DPVI of 64.6 points, with significant heterogeneity among districts. The economic dimension explains most of the differentiation, while the social and environmental dimensions function as continuity filters. This combination identifies not only where value exists, but also what conditions must be managed in order to capture it.
The appearance of districts recognized by the industry within the leading group, such as Collahuasi-Quebrada Blanca, Codelco's Northern District, Escondida-Zaldivar, and Andina-Los Bronces, provides relevant conceptual validation. The index recognizes cases where district logic already has practical expression, while also identifying emerging opportunities in other commodities and geographies.

In an industry where new supply faces longer cycles, greater technical complexity, and increasing territorial restrictions, thinking in districts is not only an optimization alternative: it is a way to increase resilience. **The ability to coordinate assets, share infrastructure, and manage common constraints can make the difference between nearby operations and true mining systems of sustainable value.**

BIBLIOGRAPHY

Business & Human Rights Resource Centre. (2025). Transition Minerals Tracker: 2025 Global Analysis. [Conjunto de datos] Business and Human Rights Centre. https://www.business-humanrights.org/en/from-us/transition-minerals-tracker/

Gilbert, C. G. (2005). Unbundling the structure of inertia: Resource versus routine rigidity. Academy of Management Journal, 48(5), 741-763.

Hannan, M. T., & Freeman, J. (1984). Structural inertia and organizational change. American Sociological Review, 49(2), 149-164.

Mayer Brown. (2020). Mining project finance: Key features. Mayer Brown Publications.

Worldwide Governance Indicators. (2024). Interactive Data Access. [Dataset].
World Bank. https://www.worldbank.org/en/publication/worldwide-governance-indicators/interactive-data-access

Worldwide Governance Indicators. (s.f.). Frequently Asked Question. World Bank. https://www.worldbank.org/en/publication/worldwide-governance-indicators/frequently-asked-questions

World Development Indicators. (2026). Terre
strial protected areas (% of total land area). World Bank.
https://data.worldbank.org/indicator/ER.LND.PTLD.ZS.

World Resources Institute. (2025). Aqueduct 4.0 Current and Future Global Maps Data. https://www.wri.org/data/aqueduct-global-maps-40-data/confirmation?
token=n1gC15oJDxpMTGskaADSNnl5V5CJOmYBeG6cgQTV_XE

AUTHORS

Isaac Paredes
Chief Operating Officer
iparedes@gem-mc.com

Alina Karpunina
Project Manager
akarpunina@gem-mc.com

Carla Campos
Analyst Engineer
ccampos@gem-mc.com

COMMERCIAL CONTACT

Felipe Guzmán
Partner - Chief Financial, Administration and Marketing Officer
fguzman@gem-mc.com

Sebastián Faúndez
Senior Business Development and Analytics Specialist
sfaundez@gem-mc.com

Chile: Las Condes Avenue 12.461, tower 3, office 805-806, Las Condes, Santiago

Singapore: 1 Raffles Place, #40-02, One Raffles Place, Office Tower 1, Singapur