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From Principles to Practice: Operationalising Europe's Critical Raw Materials Strategy

Europe's Critical Raw Materials Act faces a fundamental implementation barrier: community opposition has emerged as the decisive constraint on new mining projects, not geology or economics. With 85% of known domestic mineral deposits lying within or near environmentally protected areas, operationalising the Critical Raw Materials Act requires institutional innovations grounded in community realities. Drawing on stakeholder consultations across European regions, three prerequisites for community acceptance were identified: demonstrable material criticality for societal needs, minimal environmental impact through technological innovation and fair and binding benefit-sharing. This paper introduces two complementary institutional mechanisms – systematic decision-making frameworks and community development agreements – that address these conditions while upholding democratic values and environmental standards. These frameworks require no changes to EU legislation, are adaptable across member state contexts and provide practical pathways for reconciling strategic resource security with local legitimacy.

The European Union's Critical Raw Materials Act (CRMA; Regulation 1252/2024), adopted in 2024, represents a fundamental shift towards strategic autonomy in response to growing supply chain vulnerabilities (European Union, 2024). The CRMA's ambitious targets – 10% domestic extraction, 40% processing and 25% recycling by 2030 – reflect Europe's determination to reduce strategic dependencies that have exposed the continent to geopolitical leverage and supply disruptions. This policy evolution, initiated by the Raw Materials Initiative in 2008 (European Commission, 2008), was accelerated by supply chain disruptions from unilateral trade restrictions, the COVID-19 pandemic and Russia's invasion of Ukraine.

The challenge of CRMA implementation

The CRMA's implementation faces formidable barriers spanning institutional, techno-economic and socio-environmental dimensions. Public acceptance has emerged as particularly critical, with recent cases in Serbia (Jadar lithium; Giebel et al., 2024), Portugal (lithium operations; Lusa, 2024) and France (Échassières lithium; Canas, 2024) demonstrating that technical, economic and regulatory feasibility are necessary but insufficient. The decisive constraint is not what can be mined, but what will be accepted to be mined.

Mineral criticality emerges at the intersection of geological endowment, technological necessity and geopoliti-

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cal structure (European Commission, 2017). Unlike other commodities, minerals face geological realities that cannot be engineered away. Ore deposits occur only under particular conditions and in limited locations, creating structural dependencies. Whilst most critical minerals are required in comparatively small quantities, all are technologically irreplaceable in specific applications, meaning that substitution options are severely limited. Moreover, extraction and processing require highly specialised infrastructure, technical expertise and lengthy development timelines, creating bottlenecks that cannot be rapidly overcome even with substantial capital investment.

Europe's mineral resource challenge reflects deeper tensions in contemporary governance between strategic imperatives and local democratic participation. The CRMA articulates European strategic interests in reducing import dependencies, yet these EU-level objectives must be implemented through projects imposing concentrated, long-term impacts on specific communities. Without legitimate governance frameworks reconciling these scales, strategic ambitions risk foundering on local opposition – or being imposed in ways that undermine democratic values.

From theory to practice

Correia and Falck (2025) diagnosed CRMA implementation barriers and proposed a three-pronged strategy addressing public acceptance, financing and international cooperation. Their framework identified community development agreements (CDAs), financing guarantees and a global minerals trust as complementary mechanisms. This analysis provided essential conceptual foundations but left crucial operationalisation questions unanswered: How exactly should these mechanisms function? What institutional designs reconcile competing interests? What conditions make societal acceptance possible?

This paper advances from diagnosis to prescription by presenting empirically grounded institutional frameworks tested through two years of stakeholder consultations across European mining regions.

First, we document three non-negotiable conditions under which communities accept mining operations in environmentally protected areas. These emerged consistently from Delphi panels, deliberative workshops and structured consultations. Communities will consider mining only when: first, material criticality is demonstrable; second, environmental impact is minimal; and third, benefit-sharing is fair and binding. These three conditions function as an integrated system; communities reject approaches that cherry-pick one or two conditions while ignoring the third.

Second, we present institutional mechanisms operationalising these conditions within existing legal frameworks. A systematic three-tier decision-making protocol addresses criticality (Condition 1) through a transparent, evidence-based assessment of public interest, economic feasibility and environmental compatibility. Community development agreements address benefit-sharing (Condition 3) through binding tripartite contracts establishing enforceable participation rights and equitable distribution. Together with technological innovation enabling low-impact extraction (Condition 2), these frameworks transform social licence from veto constraint into negotiated governance.

Third, we provide implementation pathways adaptable to diverse member state contexts. Neither mechanism requires EU legislative changes; both operate within existing constitutional and administrative structures.

The social acceptance challenge

Why traditional approaches fail in European contexts

Opposition to mineral projects in Europe typically stems not from the “not in my backyard” syndrome often invoked dismissively, but from a profound disconnection between EU-level policy priorities and local interests (Tost et al., 2021). Europe's mining history shapes current attitudes: decades of disinvestment, relocation of environmental burdens to developing countries and loss of domestic technical capacity have created societal memory that views mining with suspicion (Bridge, 2004; Correia et al., 2024a). The trust deficit is compounded when communities perceive that CRMA benefits accrue to distant Brussels or multinational corporations while burdens – environmental impacts, social disruption, landscape transformation – are concentrated locally and persist across generations (Kivinen et al., 2020; Dunlap & Riquito, 2023).

The European context differs fundamentally from mining regions in Canada, Australia or developing countries where CDAs and social licence frameworks have evolved (O’Faircheallaigh, 2013). Europe has higher institutional trust expectations, comprehensive regulatory frameworks with robust enforcement, strong environmental consciousness, dense populations increasing proximity impacts and democratic traditions demanding genuine participation rather than consultation theatre (Lesser et al., 2023). Traditional approaches relying on technical environmental impact assessments and expert consensus have proven markedly insufficient in addressing value-based concerns about place attachment, environmental stewardship and community autonomy (Stewart & Lewis, 2017).

The environmental paradox and spatial constraints

Research from the Horizon Europe CIRAN project reveals that 85% of Europe's critical mineral raw material occurrences are located either beneath environmentally protected areas or within a five kilometre proximity (Ovaskainen et al., 2024). This is not an outlier situation requiring site-by-site exemptions; it is the structural reality. When combined with the Nature Restoration Law's requirement to restore at least 20% of EU land and sea areas by 2030, and calls to expand protected areas to 30% of EU territory, the spatial constraint intensifies rather than diminishes (European Commission, 2024).

This creates a serious governance challenge: two legitimate public interests – resource security and environmental protection – directly conflict in specific places. No amount of technical assessment can resolve this tension; it requires political judgement about which objectives take precedence under what conditions. Yet existing regulatory frameworks provide no systematic method for weighing these incommensurable values, leading to either administrative deadlock or decisions perceived as arbitrary.

Existing governance gaps

Current permitting systems fragment decision-making across multiple regulators (mining law, environmental protection, water management, spatial planning, cultural heritage) with divergent mandates and institutional cultures (Tiess, 2010; Tost et al., 2018). For example, an environmental regulator's mission is protection, a mining regulator's mandate includes enabling responsible resource development, and economic development agencies prioritise investment and employment. Without coordination mechanisms, sequential processing creates opportunities for delay, conflicting requirements and decisions by default through administrative dysfunction rather than reasoned deliberation.

Moreover, public consultation processes, while required, often function as procedural compliance exercises rather than genuine participation (Arnstein, 2007; Owen & Kemp, 2017). Communities provide input but have no binding influence on outcomes (Dunlap & Riquito, 2023). Promises made during permitting may have legal force if reflected in the eventual resolution, but subsequent authority and public monitoring are also attributes of due implementation. Benefits, if any, frequently depend on voluntary corporate commitments that companies can modify or withdraw at any moment. The structural power asymmetry, i.e. companies possess legal expertise, financial resources and project experience while communities rely on external support, leaves affected populations at a disadvantage in negotiations.

What is missing is not more technical assessment but decision-making frameworks for demonstrating public interest, binding mechanisms for community participation and adaptive regulation enabling technological innovation.

What European communities expect

Our findings derive from a comprehensive citizen engagement programme conducted within the Horizon Europe project CIRAN¹ explicitly designed to move beyond proxy debates between environmental organisations and industry representatives to engage actual communities. Between 2023 and 2025, CIRAN organised 12 citizen engagement activities across six European countries – Czechia, France, Ireland, Italy, Portugal and Slovakia – involving 173 participants through focus groups and public dialogues combining educational and deliberative elements (Cescon et al., 2025).

Participants were deliberately recruited for diversity across multiple dimensions: representatives of public and private bodies, local non-governmental organisations, and civil society organisations, with 14% participating as individual citizens. Gender distribution was 57% male and 43% female. Crucially, participants represented diverse geographical contexts: regions with historical mining experience and those without extraction, economically developed areas and periphery regions, locations adjacent to or included in environmentally protected areas under different designations, and jurisdictions with varied regulatory frameworks and political traditions. This diversity enabled the identification of conditions that hold across contexts rather than reflecting local idiosyncrasies.

The focus groups revealed remarkably consistent patterns despite national differences. Participants expressed deep concern for environmental sustainability, strong mistrust in central government and mining executives, and widespread demand for education, transparency and genuine public involvement. Across all countries, citizens favoured circular economy approaches over primary extraction and supported mining only under strict, ethical and transparent governance frameworks.

The public dialogues yielded five cross-cutting themes. First, participants articulated broad demand for transitioning to circular economies and more sustainable consumption patterns. Second, they firmly prioritised environmental protection, particularly opposing mining in protected areas without compelling justification and robust safeguards. Third, they expressed conditional rather than absolute opposition: acceptance was possible but only un-

¹ www.ciranproject.eu

der strict ethical standards, environmental oversight and meaningful community participation. Fourth, participants demonstrated widespread mistrust in government and corporate influence. Fifth, they strongly supported investment in education, technological innovation enabling minimal-impact extraction and inclusive public engagement.

The findings demonstrate that European communities, when provided with balanced information and structured opportunities for deliberation, articulate sophisticated positions recognising both the necessity of certain minerals for societal transitions and the non-negotiable requirements for responsible extraction. The consistency of these conditions across diverse national contexts strengthens confidence that they reflect fundamental requirements for social licence.

The three non-negotiable conditions

Condition 1: Demonstrable material criticality

Communities consistently expressed: “We will not sacrifice our environment for someone’s profit or speculative demand”. This reflects deep scepticism towards industry claims, market justifications, government and authorities. Price volatility and short-term demand signals of CRM do not convince communities to accept irreversible environmental impacts. What communities demand is transparent demonstration from independent public-interest sources that the raw material is genuinely essential for EU strategic objectives – climate transition, defence, critical infrastructure – with no viable alternatives available in relevant timeframes.

The temporal dimension matters critically. Communities recognise that criticality assessments change as technologies evolve, recycling capacity expands, and substitutes emerge. They therefore demand forward-looking analysis acknowledging uncertainty while demonstrating robust demand scenarios. The burden of proof lies with those proposing extraction to show why domestic mining is necessary rather than just convenient, and why this specific deposit must be developed rather than alternatives pursued.

Condition 2: Zero or minimal environmental impact

The statement “If you cannot mine it without destroying what we value, do not mine it” recurred throughout consultations. Traditional open-pit mining generating large waste volumes, permanent landscape transformation and visual impacts is categorically rejected in or near environmentally protected areas. However, communities demonstrated willingness to consider underground mining with minimal surface footprints, provided that: operations re-

main invisible or barely visible from the surface; waste is managed underground or through dry stacking, eliminating tailings ponds; water systems are closed-loops with no discharge to surface waters; biodiversity impacts are avoided or, where unavoidable, offset by net positive conservation; rehabilitation extends throughout operation; and long-term environmental stewardship continues beyond mine life.

Technological advancement – precision extraction, underground processing, backfilling of extractive waste – has transformed what is possible (Köllner et al., 2023; Correia et al., 2024b). Communities make their acceptance conditional on operators demonstrating that extraction is compatible with environmental protection through innovation, rather than accepting conventional mining methods.

Condition 3: Fair and binding benefit-sharing

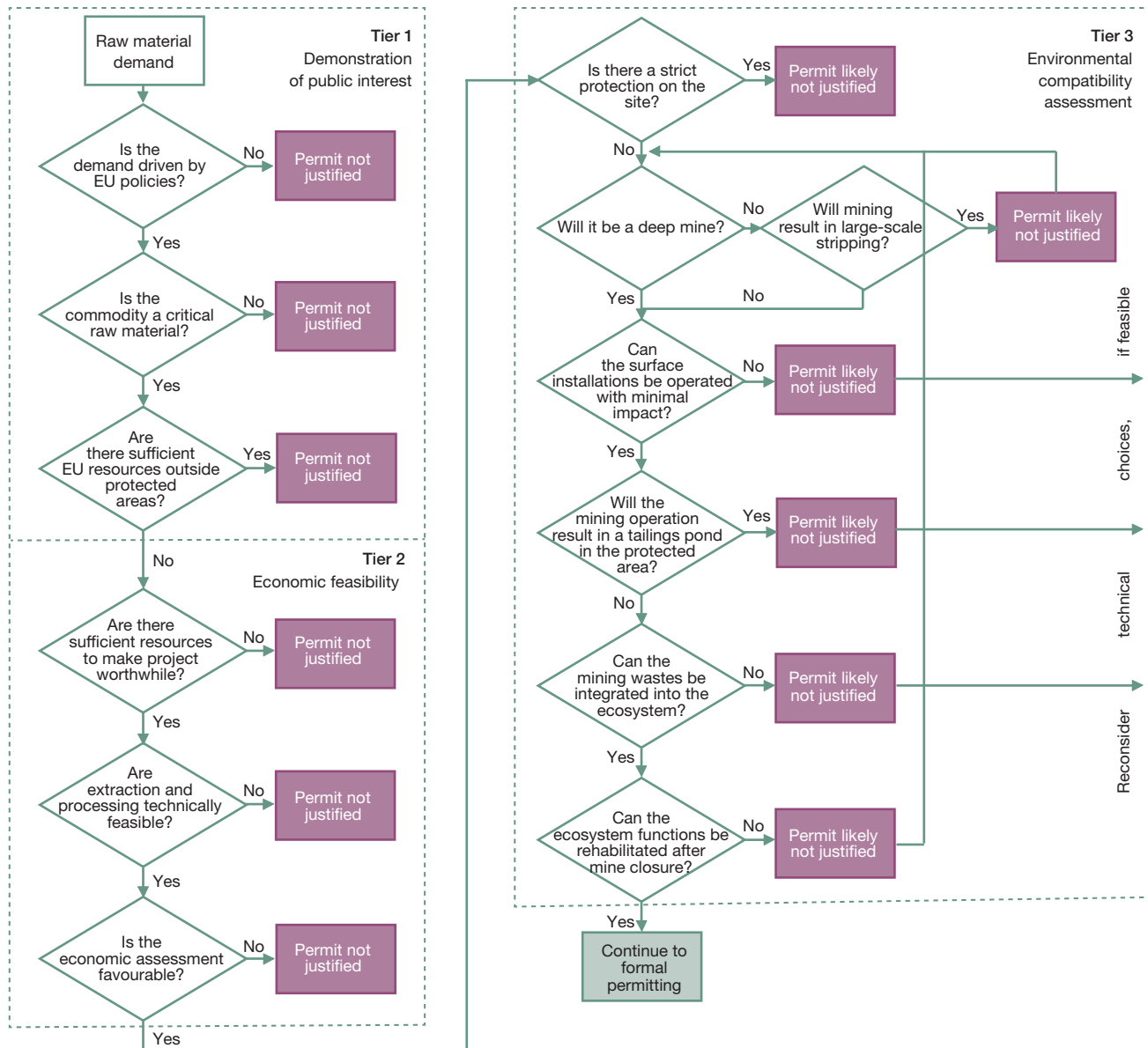
“Why should we bear the risk while others reap the rewards?” This question reflects fundamental concerns about distributional equity. Tax revenues flowing to national budgets, employment opportunities requiring specialised skills from outside the region and vague promises of economic development provide insufficient justification. Communities demand tangible, local benefits: guaranteed employment for residents, skills training creating transferable competencies, infrastructure investments addressing community priorities and resources for environmental enhancement extending beyond project boundaries.

Crucially, benefit-sharing must be legally enforceable, not dependent on corporate goodwill. Voluntary corporate social responsibility initiatives, subject to company discretion, generate cynicism rather than trust. Communities require binding contracts establishing rights and obligations for all parties – government, company and community – with clear enforcement mechanisms and dispute resolution procedures. Moreover, benefits must extend beyond operational periods, with mine closure creating economic adjustment challenges that require support for diversification to ensure sustainable livelihoods after minerals are exhausted.

The conditions as an integrated system

These three conditions function interdependently. Communities reject substitution – high payments cannot compensate for environmental destruction, nor can perfect environmental management justify extraction serving no genuine public interest. The conditions reinforce each other: demonstrating criticality creates a mandate for accepting carefully managed impacts; technological solutions enabling minimal impact

Figure 1
Graphical representation of the decision-making protocol



Source: Authors' elaboration.

make criticality arguments more defensible; benefit-sharing addresses equity and creates community stakes in success. What communities consistently reject is cherry-picking one or two conditions while ignoring others or approaching negotiations as adversarial rather than collaborative.

Step 1: Demonstrating public interest

The first community condition requires systematic demonstration that domestic extraction serves “overriding

public interest”. We propose a three-tier protocol operating within existing regulatory frameworks and requiring no legislative changes (Figure 1). Each tier is structured around a core question, assessment methodology, and a decision point to ensure a transparent and replicable evaluation.

Tier 1: Overriding public interest

Question: Is there a compelling public interest justification for domestic extraction of this specific material?

Methodology: The Drivers-Pressures-States-Impacts-Responses (DPSIR) framework (Kristensen, 2004) systematically evaluates whether CRM demand constitutes justifiable public interest: Drivers (which EU or national policies create demand – Green Deal renewable energy targets, defence technologies, digital infrastructure, industrial and societal resilience, open strategic autonomy); Pressures (consequences of import dependency – price volatility, geopolitical leverage by dominant suppliers, supply disruption risk); States (current and projected supply-demand balance – can demand be met through recycling, substitution, stocking, or secure imports); Impacts (consequences if domestic sources are not developed – stranded climate targets, strategic vulnerability, technology deployment constraints); Responses (policy options beyond domestic extraction – are they sufficient and timely?).

The analysis must project 10-15 years forward, matching mine development timelines, while acknowledging uncertainty through scenario analysis. The output is defensible public interest justification specific to this mineral deposit or demonstration that alternatives suffice.

Decision point: If no overriding public interest can be demonstrated, exploration ceases.

Tier 2: Economic feasibility under enhanced protection

Question: Can extraction be economically viable while meeting exceptional environmental protection requirements?

Methodology: The assessment applies industry-standard tools – CIRISCO-compliant² resource evaluation for investors and UNFC³ for strategic evaluation – but integrates enhanced costs for environmental protection, monitoring, rehabilitation, long-term stewardship and social licence (community benefit-sharing, extended stakeholder engagement). This assessment is inherently iterative. Initial economics may be unfavourable, but adjustments to mining methods, processing technologies or benefit-sharing arrangements may create viability.

Decision point: If no economically viable scenario exists, even with iterative optimisation, extraction is not justified.

Tier 3: Environmental compatibility assessment

Question: Can extraction be conducted compatibly with protected status?

² CIRISCO (Committee for Mineral Reserves International Reporting Standards) is an international reporting framework used to classify and assess the feasibility of mining projects.

³ UNFC (United Nations Framework Classification) is a system for classifying mineral, energy and other resource deposits based on their technical and socio-economic viability.

Methodology: This tier systematically examines whether technical solutions reconcile extraction with conservation objectives, evaluating protection requirements (IUCN category, Natura 2000 designation, cultural heritage status); technical solutions (underground mining, minimal surface footprint, underground waste disposal, closed-loop water systems, biodiversity avoidance measures); mitigation hierarchy (avoiding impacts, minimising unavoidable impacts, rehabilitating disturbed areas, compensating residual impacts); net positive outcomes (habitat corridors, buffer zone creation, expanded protected areas funded by project revenues). The compatibility assessment is not pass/fail but negotiated optimisation. It is enshrined in EU legislation such as the Environmental Impact Assessment (EIA) Directive as “Scoping Opinion” and “Development Consent”, and in the Natura Directives, where stakeholder consultation is integrated into the “appropriate assessment”. These steps, together with water permit procedures, can be integrated into one (Hámmor et al., 2021a). The assessment may conclude extraction is compatible only with specific technologies, operational constraints, enhanced monitoring or compensatory measures, or that no technical solution adequately protects site values.

Decision point: If compatibility can be achieved, proceed to permitting with binding conditions. If not, extraction is refused.

Integration and iteration across tiers

The three tiers are not strictly sequential. Information from Tier 3 may affect Tier 2; economic constraints may influence Tier 1. The protocol explicitly accommodates iteration, increasing the likelihood of finding solutions where they exist while providing clear documentation when they do not. Each tier produces publicly accessible documentation showing decision paths and alternatives considered.

Addressing regulatory fragmentation

Decision-making about extraction in protected areas occurs within multiple regulatory frameworks: mining law, environmental protection, water management, spatial planning and cultural heritage (Hámmor et al., 2021b). Effective implementation requires coordination mechanisms that designate a clear lead authority for coordinating assessment, create inter-agency fora with all relevant regulators, establish unified information-sharing platforms, specify consultation timelines preventing sequential delays and provide dispute resolution procedures when regulatory bodies disagree.

Some member states have “one-stop-shop” permitting systems providing natural homes for integrated protocols.

Where these do not exist, implementation may require establishing coordination mechanisms. Importantly, coordination does not mean subordinating environmental protection to economic objectives; each regulator retains its statutory mandate.

Step 2: Defining equitable benefit-sharing

Public consultation, while required, functions as a procedural exercise providing communities with voice but no binding influence (Arnstein, 2007). Promises made during permitting lack legal force if not incorporated into the final authority resolution permit. Benefits frequently depend on voluntary corporate commitments revocable at company discretion. The power asymmetry – companies possess legal expertise, financial resources and technical knowledge while communities rely on external support – structurally disadvantages affected populations (Lesser et al., 2023). Community condition 3 demands binding, enforceable benefit-sharing. CDAs provide a tested legal basis (World Bank, 2012; O’Faircheallaigh, 2014).

Community development agreements: Structure and elements

CDAs are formal, legally binding tripartite contracts (Otto, 2010) between government (national and local levels), the mining company and affected communities (represented through recognised legal association supported by the majority of inhabitants). CDAs are structured around several core components.

Ownership and equity participation refer to mechanisms that enable communities to become shareholders in mining operations, transforming them from passive recipients of benefits into active co-owners with seats at decision-making tables. This can include direct equity stakes in project companies, community investment trusts holding shares on behalf of residents, or profit-sharing arrangements that evolve into ownership positions over time. Ownership fundamentally changes power dynamics, ensuring that communities negotiate benefits as partners with fiduciary interests aligned with project success and long-term sustainability.

Employment and skills development include guaranteed hiring quotas from the local/regional labour force, skills training programmes for mine-related and transferable competencies, workforce development extending beyond mine operation, as well as apprenticeships and career pathways.

Benefit-sharing mechanisms focus on transparent formulas linking community benefits to project revenues. They

also include community development funds with local control over allocation, as well as infrastructure investments (roads, schools, water provision, health facilities, broadband internet) and support for economic diversification reducing dependence on the mine.

Environmental protection commitments include standards exceeding regulatory minima where appropriate and community participation in environmental monitoring as well as independent verification of compliance. These commitments mean the promotion of habitat enhancement and biodiversity net positive outcomes in addition to long-term environmental stewardship funds.

Community participation rights require a representative monitoring body with genuine authority. This body should have adequate resourcing for technical capacity and independent advice, regular reporting and transparent information sharing, and influence over operational decisions affecting the community.

Dispute resolution entails graduated procedures (negotiation followed mediation and, if necessary, arbitration) featuring independent mediators who are acceptable to all parties. Accessible grievance mechanisms help to ensure binding resolutions, which in turn prevent prolonged conflicts.

Duration and mine closure provisions ensure that agreements extend beyond the operational period. They include post-closure rehabilitation commitments, legacy funds for long-term environmental management and transition planning for economic adjustment.

International evidence and European adaptation

Canada’s Raglan Mine (Glencore’s nickel operation with Inuit communities) demonstrates CDA success: a 20% Inuit workforce, two billion Canadian dollars in community benefits over 25 years, and environmental co-management (Newswire, 2024). Australia’s Pilbara region native title agreements with Rio Tinto achieved 12% Indigenous workforce participation and over one billion Australian dollars in community investments (YMAC, 2011). Mongolia’s Oyu Tolgoi CDA resolved initial disputes through benefit-sharing, environmental monitoring and capacity building (Sternberg et al., 2019).

European contexts differ: there are higher institutional trust expectations, comprehensive regulatory frameworks, strong environmental consciousness and established democratic traditions. CDAs must therefore supplement rather than replace statutory protections, integrate with existing permitting and monitoring systems

and adapt to diverse community definitions (e.g. municipalities, regional and local associations).

Legally, CDAs require no legislative changes at the EU level. They operate within existing frameworks: national civil codes, the Company Law Directive (1132/2017), the Corporate Sustainability Reporting Directive (2464/2022), the Accounting Directive (34/2013) and the Taxonomy Regulation (852/2020). Member states may need European Commission guidance on implementation within national legal systems, and precedents exist in other sectors (e.g. renewable energy community benefit agreements; CAN, 2025).

Enabling CRMA implementation through integrated governance

How the mechanisms interact

The decision protocol establishes whether extraction is justified (Condition 1). CDAs establish how benefits are distributed and communities participate (Condition 3). Technology and adaptive regulation determine what methods minimise impacts (Condition 2). These mechanisms are complementary and mutually reinforcing:

- The decision framework without CDAs provides justification without legitimacy;
- CDAs without a decision framework create agreements without a clear public interest foundation;
- Neither mechanism, without technological innovation, can meet minimal impact requirements.

Together, they transform social licence from a blocking condition into negotiated good governance. Communities gain binding participation rights, transparent demonstration of public interest, enforceable benefit-sharing and verification that environmental commitments are met. Operators gain regulatory clarity, reduced permitting delays and community partnerships supporting rather than opposing projects. Governments reconcile EU-level strategic objectives with local democratic participation.

Implementation barriers and remaining challenges

Correia and Falck (2025) identified three critical barriers: social acceptance, financing mechanisms and international cooperation. This paper focuses primarily on social acceptance – the binding constraint – by operationalising solutions through institutional design. However, the frameworks also support the other dimensions. The decision protocol de-risks investment by clarify-

ing whether projects can proceed, reducing permitting uncertainty that deters capital. CDAs' transparent benefit-sharing improves project bankability. Enhanced environmental standards are integrated into the economic assessment (Tier 2), providing realistic feasibility metrics. European governance innovations can inform partnerships with resource-rich countries. CDAs and decision protocols are exportable to partner jurisdictions, strengthening EU global leadership in responsible mining governance.

These mechanisms cannot overcome situations where technical solutions do not adequately protect site values, make economically unviable projects viable, resolve cases where public interest genuinely does not justify extraction or convert deep ideological opposition to mining in principle. What they can meaningfully improve is transparency and legitimacy of decision-making, community participation and benefit-sharing, environmental protection through enhanced standards and monitoring, and probability of successful implementation where justifiable.

Success requires a sustained commitment encompassing political will to implement frameworks consistently, adequate resourcing for community capacity and monitoring, regulatory capacity to evaluate innovative technologies, and long-term institutional learning.

Policy recommendations

Translating the institutional frameworks into practice requires coordinated action across multiple governance levels, each with distinct capacities and responsibilities. The proposed implementation strategy balances ambition with realism, recognising that governance innovation cannot be imposed uniformly but must accommodate diverse national contexts, regulatory traditions and political constraints.

Strategic actions for EU institutions

EU institutions can catalyse implementation without requiring legislative amendments by leveraging existing policy instruments. Most immediately, EU institutions should integrate the decision-making protocols and CDAs into the criteria for strategic project designation under the CRMA, potentially through adjustment of future calls or release of a specific guidance document. Projects demonstrating these governance innovations would receive prioritised consideration for EU financial support and streamlined permitting coordination.

Equally important is the development of comprehensive EU-level guidance documents providing member states with practical templates adaptable to national legal frame-

works. Such guidance should include methodological specifications for implementing the three-tier protocol, model CDA templates customisable to regional circumstances, best practice libraries drawing on pilot implementations and technical standards defining low-impact mining technologies. The European Commission is well-positioned to coordinate development through the Joint Research Centre and the Critical Raw Materials Board.

Financial support mechanisms represent a critical enabler. Dedicated funding streams within the European Competitiveness Fund – or through existing instruments such as InvestEU, Horizon Europe or cohesion policy programmes – should prioritise support for protocol development and pilot testing, community capacity building, independent monitoring infrastructure and technology demonstration projects.

EU institutions should facilitate knowledge exchange among member states through establishment of a European network for governance innovation in mineral development. This could operate through regular meetings convened by the Commission, research partnerships evaluating implementation outcomes and integration with existing platforms such as the European Raw Materials Alliance, the European Technology Platform on Sustainable Mineral Resources or the International Raw Materials Observatory.

Finally, public acceptance, designated as indicator No. 2 in the Raw Materials Scoreboard, requires dedicated attention at the EU level. Building societal trust in the CRM sector necessitates a transparent demonstration of environmental responsibility throughout mineral value chains. In this regard, EU bodies may consider the extension of its ecolabel and eco-design legislation to mineral raw materials, which could significantly strengthen public trust in the CRM sector.

Implementation requirements for member states

Member states bear primary responsibility for operationalising these frameworks within their constitutional and administrative law structures. The first essential step involves formal adoption and adaptation of the decision-making protocol. This requires designation of lead authorities responsible for coordinating assessments, development of national guidance documents translating EU-level principles into jurisdiction-specific procedures, and systematic training programmes ensuring regulatory staff understand the protocol's logic and application.

Pilot programmes represent the most effective pathway for testing, refining and building confidence. Each mem-

ber state should launch frameworks in selected representative regions, deliberately varying protection designations, mineral deposits, institutional structures and stakeholder contexts. Rigorous evaluation and transparent reporting on both successes and challenges build the evidence base necessary for broader adoption.

Strengthening institutional capacity must accompany framework adoption. This encompasses establishment of formal inter-agency coordination mechanisms preventing sequential delays, investment in spatial data infrastructure ensuring INSPIRE Directive compliance, provision of resources enabling communities to participate meaningfully and creation of independent monitoring frameworks verifying environmental commitments throughout project lifecycles.

Member states may also enact regulatory reforms enabling technological innovation in the mining industry. Performance-based standards that specify environmental outcomes rather than prescribing technologies, fast-track permitting pathways for demonstrably superior methods, public investment in research and development partnerships and cross-border learning about novel regulatory approaches can all accelerate the technological transformation necessary to meet the second community condition.

Roles for industry and civil society

While government action is necessary, success ultimately depends on constructive engagement from industry and civil society. Mining companies should embrace proactive community engagement, beginning well before formal permitting applications; transparency about project economics and environmental impacts; willingness to negotiate CDAs as standard practice; and investment in technological innovation proving low-impact extraction feasibility.

Civil society organisations and communities should participate constructively in framework development and pilot testing, providing feedback that improves practical functionality. This includes building technical capacity for meaningful engagement, holding governments and companies accountable to commitments and recognising the complexity inherent in reconciling competing public interests. Environmental organisations have particularly important roles as honest brokers who can validate that frameworks genuinely protect environmental values while enabling extraction where justifiable.

The outlined implementation pathway is ambitious but achievable. It requires sustained commitment across electoral cycles, adequate resourcing and political cour-

age to embrace innovation. The alternative – continuation of current approaches that generate social conflict, delay and democratic deficit – has already proven untenable.

Conclusions

Europe faces a choice in implementing the Critical Raw Materials Act. It can continue with traditional permitting approaches that generate endless conflict, delay and ultimately failure to achieve strategic objectives. Alternatively, it can embrace governance innovations that respect both strategic necessities and democratic values.

Societal acceptance is possible under specific conditions. Communities will consider mining operations when materials criticality is transparently demonstrated, environmental impacts are minimised through technological innovation, and benefit-sharing is fair and binding. These conditions cannot be met through ad hoc negotiations or voluntary corporate commitments; they require systematic institutional frameworks.

The decision-making protocol provides transparent, evidence-based justification of public interest while assessing economic feasibility and environmental compatibility. Community development agreements create binding participation mechanisms and equitable benefit distribution. Together with technological innovation enabling low-impact extraction, these frameworks operationalise the strategy proposed by Correia and Falck (2025) through institutional designs tested with communities, industry and regulators across Europe.

Implementation does not require EU legislative changes. Both mechanisms operate within existing legal frameworks and are adaptable to diverse member state contexts. What is required is political commitment to embrace institutional innovation, sustained endurance for phased implementation and genuine respect for community voices.

The stakes extend beyond mineral supply. Europe's response to the CRMA implementation challenge will determine not only its industrial competitiveness and strategic autonomy but its capacity to demonstrate that democratic governance can effectively address complex, multi-scale challenges where global imperatives and local impacts collide. The frameworks presented here offer templates for reconciling these tensions, not through technocratic imposition but through transparent justification, binding participation, and equitable distribution of benefits and burdens.

The path forward is clear. The question is whether European institutions, member states, industry and communities will commit to governance innovation matching the

scale of the challenge. The alternative, a prolonged business-as-usual stalemate between resource security and environmental protection, serves neither objective and risks both strategic autonomy and democratic legitimacy.

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