# RE-STEM, Rail Enabled Sustainable Transportation of Essential Minerals

## The essential minerals industry in North America is at a crossroads. The efforts to re-shore and re-industrialize provide an opportunity to expand continental mineral mining and production. The industry can continue on the slow-growth path given by competition and mistrust or lead with innovative thinking that integrates environmental stewardship with industrial progress.

## Embracing a holistic approach of collaboration, innovation, and ethical commitment must include full lifecycle accounting and whole systems planning, including multi-modal transportation. The essential minerals industry can set a new standard that meets market demands while preserving the planet for future generations.

## The challenges of counterproductive regulations, well-meaning environmental groups, and community resistance persist. Embracing the principles of RE-STEM will facilitate the cooperation necessary to resolve these challenges.

## RE-STEM participants will inform the re-design of the essential minerals industry by balancing economic growth, environmental stewardship, and stakeholder interests.

## Foundational Principles

### 1. Collaborative Industrial Optimization

### 2. Environmental Responsibility

### 3. Community Engagement

### 4. Transparent Communication

### 5. Sustainable Systems Capitalization

# Convene the Essential Minerals Sustainability IntelliConference, inviting the continent’s leading environmental and community advocacy organizations to participate.

## Background Statement: Existing forums and methods for stakeholder engagement rely on competitive debate at best, creating barriers to honest communication and alignment. Rational, multidimensional idea generation and problem-solving for sustainable mineral production and use is almost impossible. A new way for stakeholders to engage is needed. CAPSI provides that forum and method.

## Core Question: What optimal volumes, locations, and design elements of essential mineral mining and processing can industry and community stakeholders, including company management, association leaders, unions, environmental organizations, and community advocacy groups agree on for a profitable and sustainable mineral mining industry?

## Round One Dialogue Questions:

### Which stakeholder groups do we want to have a voice in this IntelliConference?

### What are the continent’s “essential minerals?”

#### What factors do we apply to determining the “essential minerals?”

#### What factors do we apply to determine how much of each essential mineral we need and want?

### What are the current volumes of each essential mineral supply?

### What are the current locations of each essential mineral supply?

### What are the supply chain components for production, processing, and consumption?

#### What are the optimal volumes and locations of mineral supply to support the clean energy transition?

## Round Two Dialogue Questions:

### How do we best assess the environmental impacts?

### What are the opportunities for conserving the use of each essential mineral?

### What has to happen to accommodate reducing the consumption of individual minerals when deemed beneficial to the environment?

### When harmful environmental impacts are deemed unavoidable for any supply chain activities, how do we mitigate them?

### What environmental concerns do we want to address in how minerals are mined?

### What environmental concerns do we want to address in how minerals are processed?

### What environmental concerns do we want to address in how minerals are used and recycled?

### What steps must be taken to render anticipated environmental impacts transparent and trustworthy?

## Round Three Dialogue Questions:

### What community concerns have to be effectively addressed?

#### What are the environmental risks of mineral mining?

#### What are the degrees of risk between varying mineral mines?

#### How can potential health risks to communities be mitigated?

#### What steps must be taken to increase the community's trust in mining companies?

#### What steps can be taken to protect against esthetic degradation?

#### How can communities maintain a sense of place attachment?

#### What steps can be taken to mitigate citizens' concerns for their community when the mine is closed?

### What steps need to be taken for mining companies to improve relationships with communities?

### What strategies promote the acceptance of new mines?

### Which issues must be addressed to align the interests of mining companies and communities?

#### How does NIMBY (Not In My Back Yard) sentiment affect mining?

#### What are the challenges posed by uninformed citizens?

#### What steps can be taken to mitigate citizens' propensity to overestimate risk?

#### How can the media contribute to a more accurate and positive image of mining?

#### How can citizens orient their motivations to support the greater good instead of narrow self-interests?

#### How can citizens’ trust in governments and private enterprises be expanded?

## Round Four Dialogue Questions:

### What steps can be taken to ensure the final decision is “fair” for the community and mine developers?

### How can mining companies commit to projects that use Best Available Technology throughout the life of the mine?

### What environmental regulations on essential mineral supply chain activities must be improved or eliminated?

### How can the community's initial awareness of mining activity be communicated?

#### Switch from DAD (decide, announce, defend) to ADD (announce, discuss, decide)

#### Community-oriented mining increases domestic participation in the global mining boom and ensures equitable and resilient supply chains.

#### Shifting from fossil fuel-based energy to materials-based energy will allow North America to progress toward sustainability.

#### Materials-based energy requires less drilling than fossil-fuel energy.

#### Resisting mineral mining in the U.S. extends our dependence on China.

### What steps can be taken to ensure citizens are educated on mineral mining?

### What is the most effective way to communicate this education?

#### We rely on minerals for almost every aspect of modern life

#### China currently holds a near-monopoly on mining and processing

#### Shipping minerals by sea negatively impacts the environment, negating the benefits of products made with minerals, such as electric car batteries and wind turbines.

#### Mining for coal occurs at the surface, leaving large scars on the land, while mining for minerals occurs at a further depth in the earth, leaving less visible effects.

#### Show pictures of past successful projects

#### Communicate safety records

### How can socioeconomic gains be communicated to communities?

#### Mining is the first link in production chains

#### Mineral wealth could provide development prospects

#### Mining can be considered a cultural identity

### How can mining companies involve community leaders in decision-making?

#### increase public trust

#### Participation and community involvement persuasion skills are more effective than economic compensation.

### How can mining companies allow community participation?

#### Allow diverse stakeholders to recognize the legitimacy of different perspectives.

#### Promotes feelings of autonomy and self-determination

### How can mining companies informally communicate with communities?

#### Informal processes take time but are more effective than formal consultations

### How can mining companies increase openness and transparency?

### How can risk be communicated effectively and efficiently?

#### Avoiding conversations about objective risks, no matter how small, may contribute to community members' overestimation of risk.

#### The average person is terrible at accurately assessing risk. Many logical fallacies and cognitive biases are behind these distortions and must be acknowledged and addressed.

##### Generalizing: Making a broad generalization based on insufficient evidence where a sweeping conclusion is drawn from a limited sample that is too small to support it. “All mining is dangerous,” and “All mining pollutes the air and water.”

##### Ambiguity Bias: The tendency to avoid options that lead to an unpredictable outcome, perhaps because of insufficient data. This bias causes people to prioritize a known option over an option with an unclear outcome. Risks should always be explained using real-life examples, plastic illustrations, and not just abstract terminology.

##### Conservatism Regressive Bias: A pronounced leaning towards overestimating high probabilities and underestimating lower probabilities. When assessing risks, bigger risks are overestimated at the potential cost of neglecting the smaller risks.

##### Framing Effect: People tend to draw different conclusions from the same base data, depending on how and by whom they were presented. This means that the presentation of information can influence the recipient's behavior.

##### Neglect of Probability: Tendency to completely disregard probabilities when a decision concerning an unknown situation has to be made. Neglect of probability usually appears in emotionally charged situations.

##### The proof-seeking fallacy: Asking for 100% proof is asking for the impossible. All we can do is weigh the full body of evidence. Safety can never be proven with absolute certainty.

##### Zero-risk bias: Tendency to prefer the complete elimination of risk in a sub-part over alternatives with greater overall risk reduction. It often manifests when decision-makers address health, safety, and environmental problems.

### What steps can mine companies take to acknowledge citizen’s concerns as valid?

### What community demographics should be considered?

#### Rural?

#### Community History?

#### Conservative/Liberal?

### What moral values should be considered in communities?

#### The Moral Foundations Theory:

##### Moral Foundations are 5“Intuitive ethics.”

###### Care

###### Fairness

###### Loyalty

###### Authority

###### Purity

##### Opposition to mining and NIMBYism is an emotional response and thus must be addressed by considering how people relate to their moral ethics.

##### Liberals and Conservatives value morals with varying intensity. Liberals focus on the first two moral foundations, while conservatives value all five more equally.

### What steps can mining companies take to engage with all moral foundations?

#### Care

##### Conservatives reserve care for those who have sacrificed for the group. It can be activated by portraying a mine as a sacrifice for the country's greater good.

##### Signal words: Generous, selfless, devoted

#### Fairness

##### Conservatives value rewards in proportion to contribution. It can be activated by providing economic or other incentives for the community's contribution to hosting the mine.

##### Signal words: Equitable, righteous, virtuous, honor

#### Loyalty

##### Group cohesion is used to achieve success in conflict between two groups and determine who is part of the team and who is a traitor. Can be activated by portraying mine developers and community members as part of the same team, collaborating on mutually beneficial goals.

##### Signal words: Trust, duty, tried and true, staunch, faithful, dedicated, dependable

#### Authority

##### Respect for hierarchical relationships can be activated by acknowledging the authority of community leaders and taking a submissive role in certain situations.

##### Signal words: Respect, lead, esteem, reverence

#### Purity

##### The idea that a person, place, or object can be sacred and, therefore, polluted or contaminated can be activated by recognizing the significance of local land and portraying respect and intent to keep the sacredness intact.

##### Signal words: Purified, clean, clarified, pure, unadulterated, uncorrupted, refined, rendered

### How can mining companies and community leaders agree on early impact planning and mitigation?

#### Where the mining company is responsible for…

#### Infrastructure upgrades

#### Increase demand for public services

##### School enrollment

##### Hospitality

##### Medical Services

##### Recreation sites

##### Public Lands

#### Increased traffic puts pressure on transportation infrastructure

#### Increased population from construction

#### The strain on the housing market

### How can mining companies and community leaders agree on a Community Benefits Agreement?

#### CBAs should stay with the project, not the developer

#### Companies should act as if consent to land is required, even if it isn’t by law.

#### Ability to negotiate for and secure lasting benefits from new mines

#### Ensure shared economic development

#### Consider what communities want when the mine closes

#### Place-based opportunities

##### Infrastructure improvements

##### Local procurement provisions

##### Minimum local hire thresholds

##### Workforce training

##### Programs that build community capacity/resilience long-term

# Convene the Essential Minerals Sustainability IntelliConference, inviting the continent’s governmental agencies to participate.

## Background Statement: Regulations and permitting processes evolve over time among public- and private-sector actors with low levels of trust, free-flowing engagement, and commercial sensibility. Consequently, both public interests and private sector progress are hindered. A new approach for updating the regulatory and planning framework for the essential minerals supply chain is needed.

## Core Question: What regulations can stakeholders agree on that are either outdated, de minimis, redundant, counterproductive, or can be improved or replaced in support of the growth and safety of essential mineral production and delivery?

## Round One Dialogue Questions:

### Which federal agencies might be enrolled in participating and supporting RE-STEM?

#### Environmental Protection Agency

#### U.S. Department of Labor Mining Safety and Health Administration

#### U.S. Department of Interior Bureau of Land Management

#### U.S. Department of Agriculture Forest Service

#### U.S. Department of Interior Office of Surface Mining Reclamation and Enforcement

#### Division of Mineral Resources

#### U.S. Department of Energy

### What federal laws regulate mining?

#### [National Environmental Policy Act (NEPA)](https://www.americangeosciences.org/critical-issues/faq/what-are-regulations-mining-activities#id1)

#### [Clean Air Act (CAA)](https://www.americangeosciences.org/critical-issues/faq/what-are-regulations-mining-activities#id2)

#### [Resource Conservation and Recovery Act (RCRA)](https://www.americangeosciences.org/critical-issues/faq/what-are-regulations-mining-activities#id3)

#### [Clean Water Act (CWA)](https://www.americangeosciences.org/critical-issues/faq/what-are-regulations-mining-activities#id4)

#### [Toxic Substances Control Act (TSCA)](https://www.americangeosciences.org/critical-issues/faq/what-are-regulations-mining-activities#id5)

#### [Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA](https://www.americangeosciences.org/critical-issues/faq/what-are-regulations-mining-activities#id6))

### Which state and local agencies might be enrolled in participating and supporting this development?

#### State Surface Mining Commissions

#### State Bureau of Mines and Geology Departments

#### State Departments of Natural Resources

### What is the nature of the relationships with the relevant government agencies?

#### It relates well with the Western States Congressional and Senate Coalition, Chris is on the advisory committee of the Western States Caucus Foundation

### What are the concerns of the government agencies that encounter the mineral industry?

### What is EMA’s standing/posture/relations with our federal government?

#### EMA team is solid and capable, relate well with Congress,

## Round Two Dialogue Questions

### What policy and regulatory issues are the Essential Minerals Association and its members concerned with?

#### Clean Energy Reform Act

#### The Mining Regulatory Clarity Act reaffirms decades of mining law and precedent and provides certainty for America's mineral producers.

### What policy solutions will support the development of increased processing capacity?

#### https://fas.org/publication/critical-thinking-on-critical-minerals/

### How can government agencies and the Essential Minerals Association agree on regulatory legislation?

### How can government agencies improve mining permit inefficiencies?

#### NEPA

#### Improved Jurisdictional Coordination

#### Uniform Interagency Approach

#### Adequate Staffing and Specialized Talent

#### https://natlawreview.com/article/permitting-reform-united-states