Opportunity and Risk: Mining and the Green Energy Transition

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Rising Demand

Want this?

Then you NEED this

We need to mine better, smarter, cleaner, and fairer
Green Energy Minerals

50 minerals critical to U.S. national security and the economy

Critical Minerals

11 Overlapping Minerals

- Aluminum - Chromium
- Cobalt - Graphite
- Lithium - Manganese
- Nickel* - Rare Earth Elements - Titanium - Vanadium - Zinc*

Gold
- Tin
- Tantalum
- Tungsten

Conflict Minerals

4 minerals in Central Africa linked to conflict

Green Energy Minerals

16 minerals key to green energy transition

- Silver
- Lead
- Molybdenum
- Iron
- Copper
Green Mineral Demand
(*2° scenario*)

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Green Energy Uses</th>
<th>Percent Increase by 2050 (compared to 2018 production levels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphite</td>
<td>![Battery icon]</td>
<td>494%</td>
</tr>
<tr>
<td>Lithium</td>
<td>![Battery icon]</td>
<td>488%</td>
</tr>
<tr>
<td>Cobalt</td>
<td>![Battery icon]</td>
<td>460%</td>
</tr>
<tr>
<td>Vanadium</td>
<td>![Battery icon]</td>
<td>189%</td>
</tr>
<tr>
<td>Nickel</td>
<td>![Battery icon]</td>
<td>99%</td>
</tr>
<tr>
<td>Silver</td>
<td>![Sun and Battery icon]</td>
<td>56%</td>
</tr>
<tr>
<td>Rare Earth Elements</td>
<td>![Wind and Battery icon]</td>
<td>37%</td>
</tr>
</tbody>
</table>
Greatest Variety of Green Minerals

Number of green energy minerals mined per USAID-presence country:
- 3-4
- 5-6
- 7-8
- 9-10
- 11-12
- 13-14
- 1-2
Mining Risks & Challenges

- Mining Governance
- Conflict & Human Right Abuses
- Labor & Working Conditions
- Land Tenure & Property Rights
- Environment
- National & Local Economic Growth
### Mining Risks & Challenges

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Mining Risk</th>
<th>Key USAID Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graphite</td>
<td><img src="image1" alt="Graphic" /></td>
<td>Mozambique, Brazil</td>
</tr>
<tr>
<td>Lithium</td>
<td><img src="image2" alt="Graphic" /></td>
<td>N/A</td>
</tr>
<tr>
<td>Cobalt</td>
<td><img src="image3" alt="Graphic" /></td>
<td>Democratic Republic of the Congo</td>
</tr>
<tr>
<td>Vanadium</td>
<td><img src="image4" alt="Graphic" /></td>
<td>South Africa</td>
</tr>
<tr>
<td>Nickel</td>
<td><img src="image5" alt="Graphic" /></td>
<td>Indonesia, Philippines</td>
</tr>
<tr>
<td>Silver</td>
<td><img src="image6" alt="Graphic" /></td>
<td>Mexico, Peru</td>
</tr>
<tr>
<td>Rare Earth Elements</td>
<td><img src="image7" alt="Graphic" /></td>
<td>Burma (Myanmar)</td>
</tr>
</tbody>
</table>
Concentrated Sourcing and Processing
Examples of Solutions

Private Sector – Responsible Sourcing

Government – Anti-Corruption and Accountability

Civil Society – Watchdogs

Local Communities – Benefit Sharing
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