The Power of the Mine
A Transformative Opportunity for Sub-Saharan Africa

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http://www.worldbank.org/africa/powerofthemine
Africa’s power deficit is crippling despite huge energy resources

Only one of three Africans has access to electricity

Hydro potential: 400GW
Geothermal potential: 16GW
Natural Gas reserves: 329 tcf

Currently, about 1-2 GW of new installed capacity deployed a year. Africa needs 6-7 GW a year

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Can mines as anchor consumers be part of the solution?

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Mining is a key and well-established industry

- Mining exports represent over 20% of exports in 18 countries and over 40% in 14 countries.
- Mining fiscal revenues over 20% in total revenues in Botswana, DRC, and Guinea.

Investment in mining accounted for $3.1 billion between 2000-2012...

...and will go up to $75 billion in SSA in pipeline projects.
Power needs depend on the type of mineral and level of processing.
Mining demand for power can be up to 23 GW in 2020

Note: CAGR=Compound Annual Growth Rate

South Africa
SSA, excluding South Africa

= 3.5%
= 9.2%

Highest increase in power demand – Iron Ore and PGM Refining and Smelting

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Mining demand for power can be overwhelming in a few countries.

*If all SSA’s population had access to electricity by 2020 with triple level of today’s consumption.

[Graph showing mining and residential demand from 2012 to 2020*]

[Bar chart showing mining demand as % of total non-mining demand for different countries]
Many models of power sourcing by mines

1. Self-supply + Social Responsibility
2. Intermediate
3. Grid supply

- Self-supply + sell to the grid
- Grid supply + self supply backup
- Mines sell collectively to grid
- Mines invest in grid
- Mines serve as anchor demand for IPP

Energy requirements:

- Self-supply: 0.9 GW (2000), 2.4 GW (2020)
- Intermediate arrangements: 1.3 GW (2000), 5.7 GW (2020)
- Grid supply: 5.8 GW (2000), 15.3 GW (2020)

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Self supply is a loss for all

**Mines:**
- High cost of electricity
- Loss of competitiveness

**Grid-connected customers**

**Country:**
- Reducing possibilities for access to electricity
- Drop in exports and tax revenues
- Negative impact on GDP, and fewer jobs

**Electricity utility:**
- Loss of large customers
- Loss of steady revenue
- Loss of opportunities of economies of scale for large investments

Mine generation investments in self-supply
- 2012 – $1.3b
- 2020 – up to $3.3b

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Mining demand for power can unlock clean energy in grid arrangements

Source of power generation on grid-based arrangements

Including South Africa

Excluding South Africa

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Mining demand for power can unlock clean energy in self-supply arrangements - Guinea

- Five gold mines in North East Guinea: Siguiri, Kiniero, Lefa, Tri-K, and Kouroussa
- Three scenarios:
  - Mines self-supply (diesel)
  - Shared 150MW hydropower plant (HPP) among mines
  - Shared 300MW HPP plant also serves neighboring communities Siguiri and Kankan
- Electrification for community → 5% of total population.
- Higher capital costs but lower running costs and economies of scale: cost savings for mines around $640 million
- Project cost of $1.4 billion – IPP opportunity

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Commodity price volatility can destabilize mining demand for power

Mineral Prices 1983-2014

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Policymakers can support an attractive enabling environment

- Strengthen power sector finances
- Strengthen regulatory mechanisms
- Transparent and efficient pricing
- Support the operating environment for IPPs
- Mine-financed power projects and carefully crafted contracts
- Integrate mining demand in power sector planning
- Use regional platforms
- Source expertise

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Future can be bright if we use this opportunity carefully

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Thank You

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