



The Power of the Mine

A Transformative Opportunity for Sub-Saharan Africa

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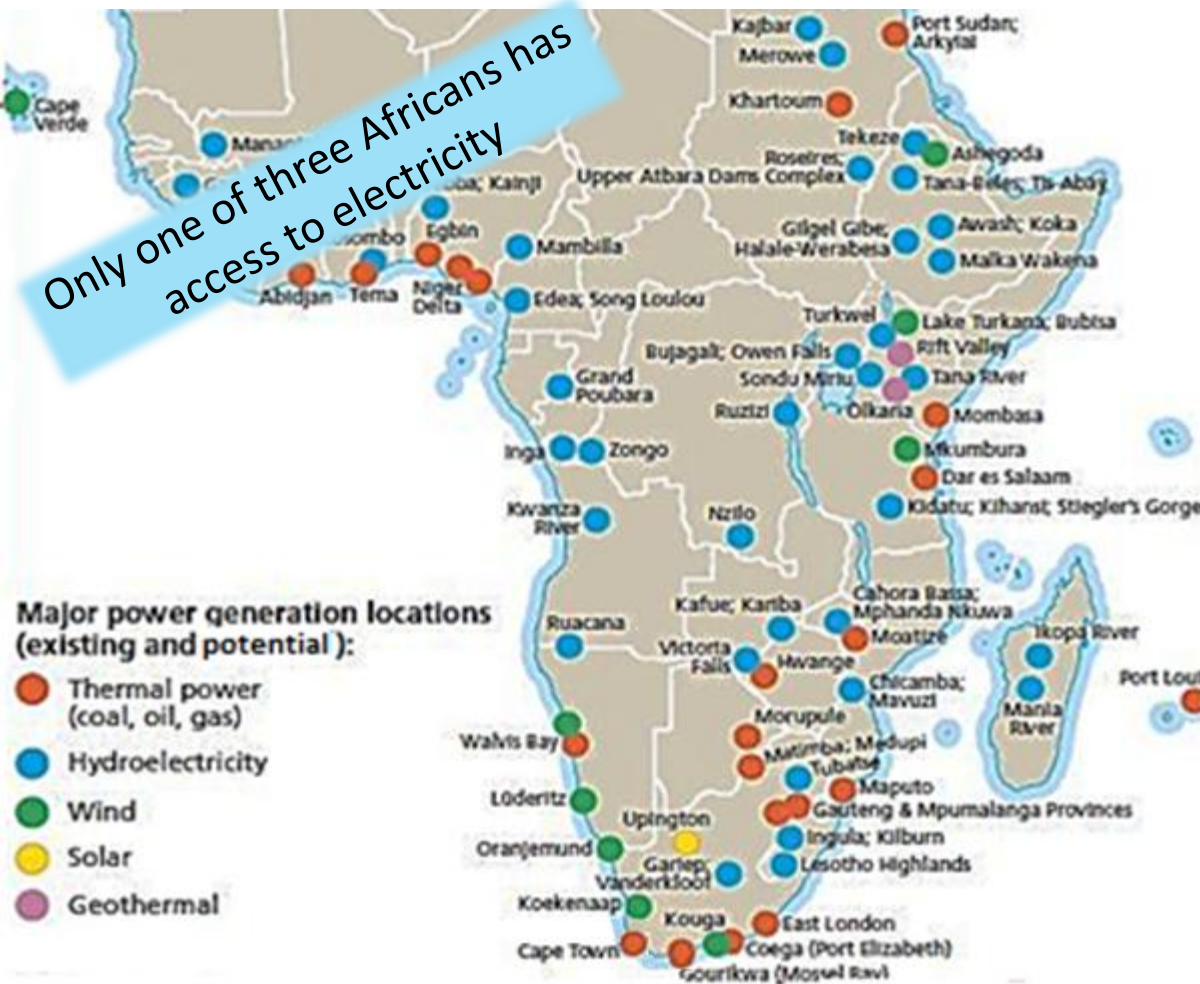


<http://www.worldbank.org/africa/powerofthemine>

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

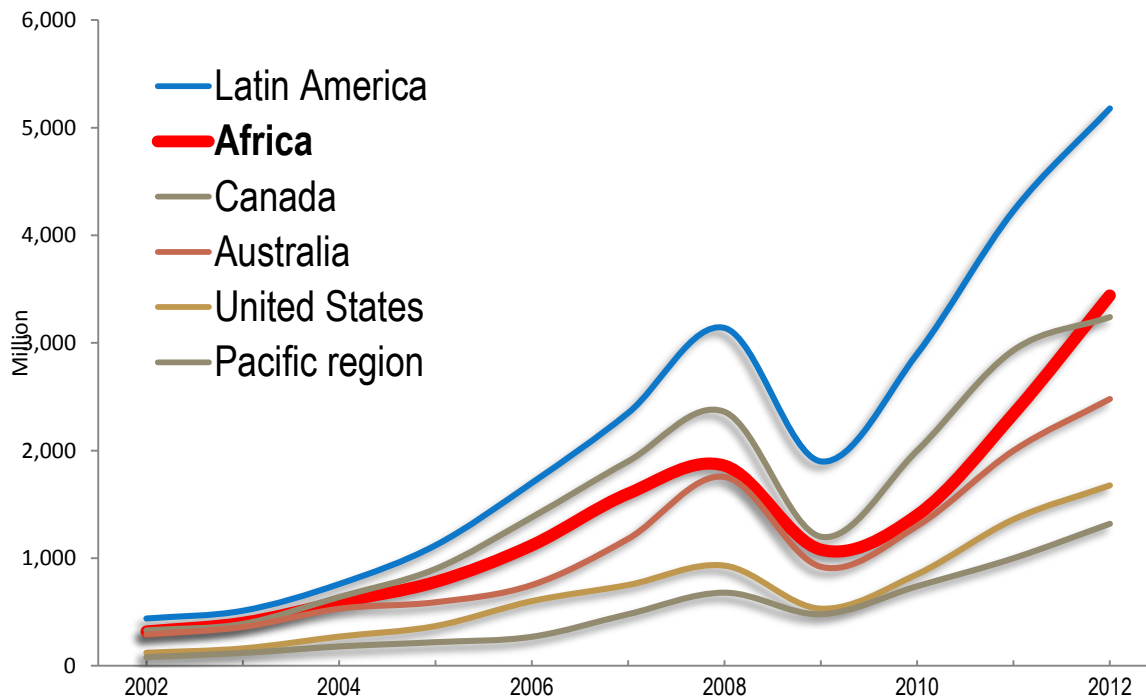
Can mines as anchor consumers be part of the solution?



Mining is a key and well-established industry



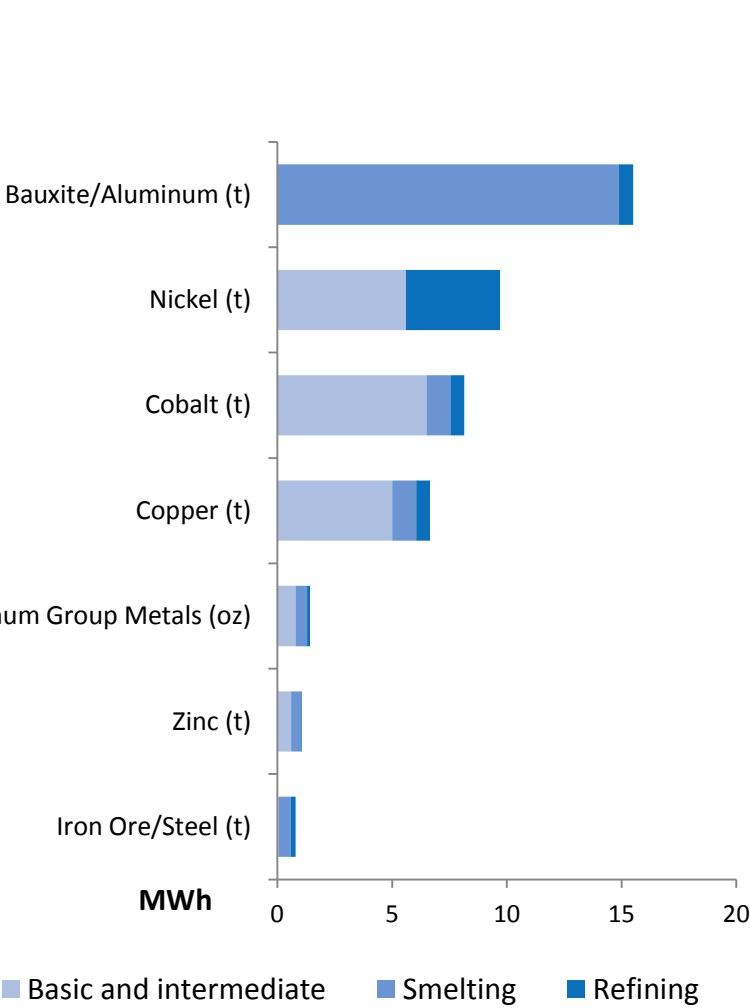
- Mining exports represents over 20% of exports in 18 countries and over 40% in 14 countries.
- Mining fiscal revenues over 20% in total revenues in Botswana, DRC, and Guinea



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



Power requirements



Processing



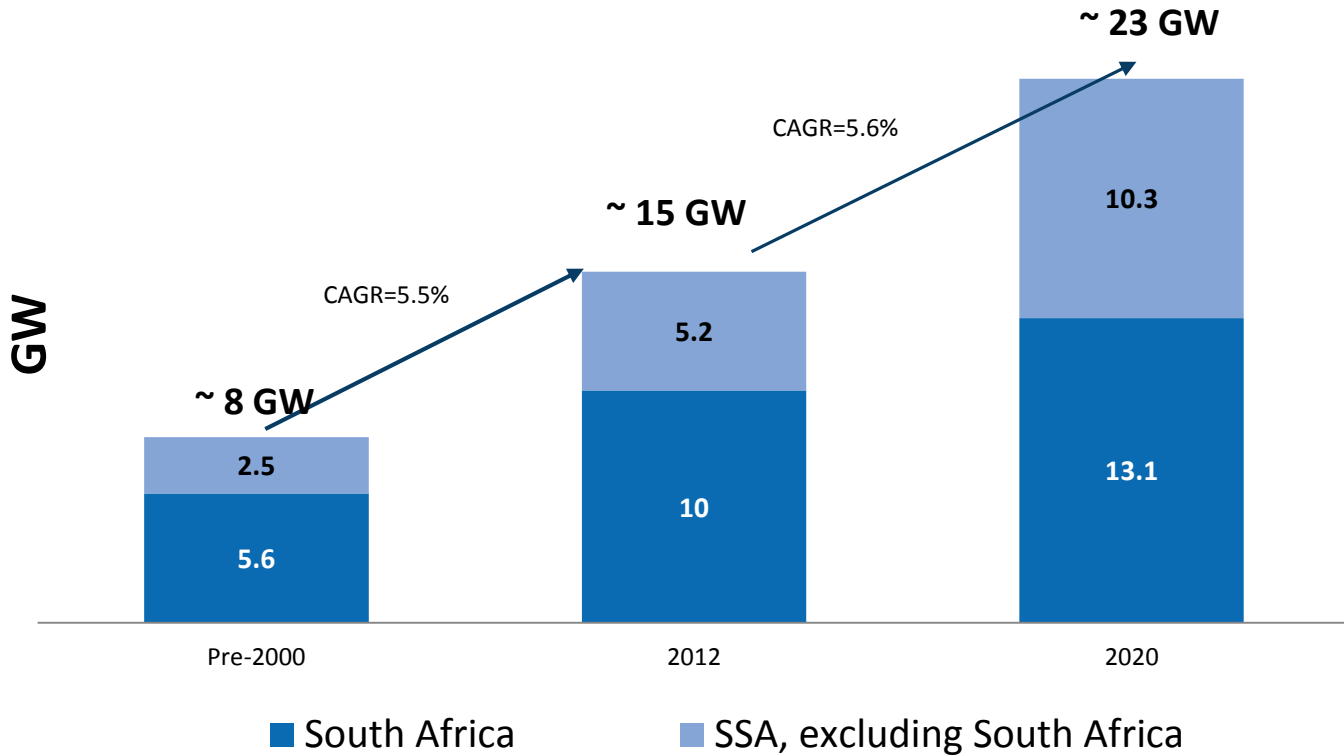
Refining

Smelting



Crushing

Mining demand for power can be up to 23 GW in 2020



Note: CAGR=Compound Annual Growth Rate

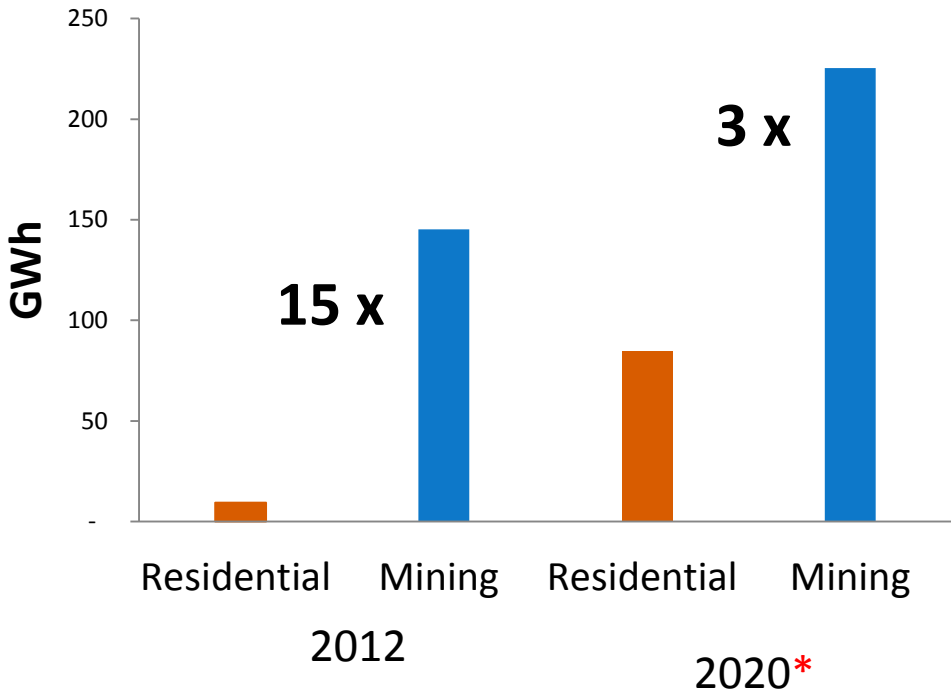
South Africa = 3.5%
 SSA, excluding South Africa = 9.2%

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

Mining demand for power can be overwhelming in a few countries

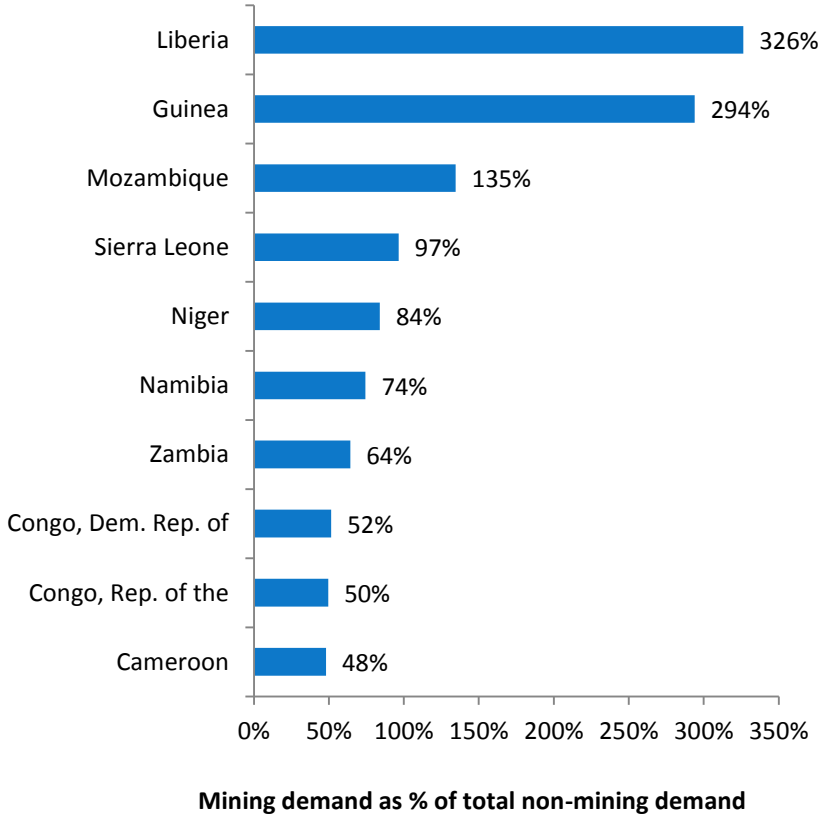


Mining and residential demand

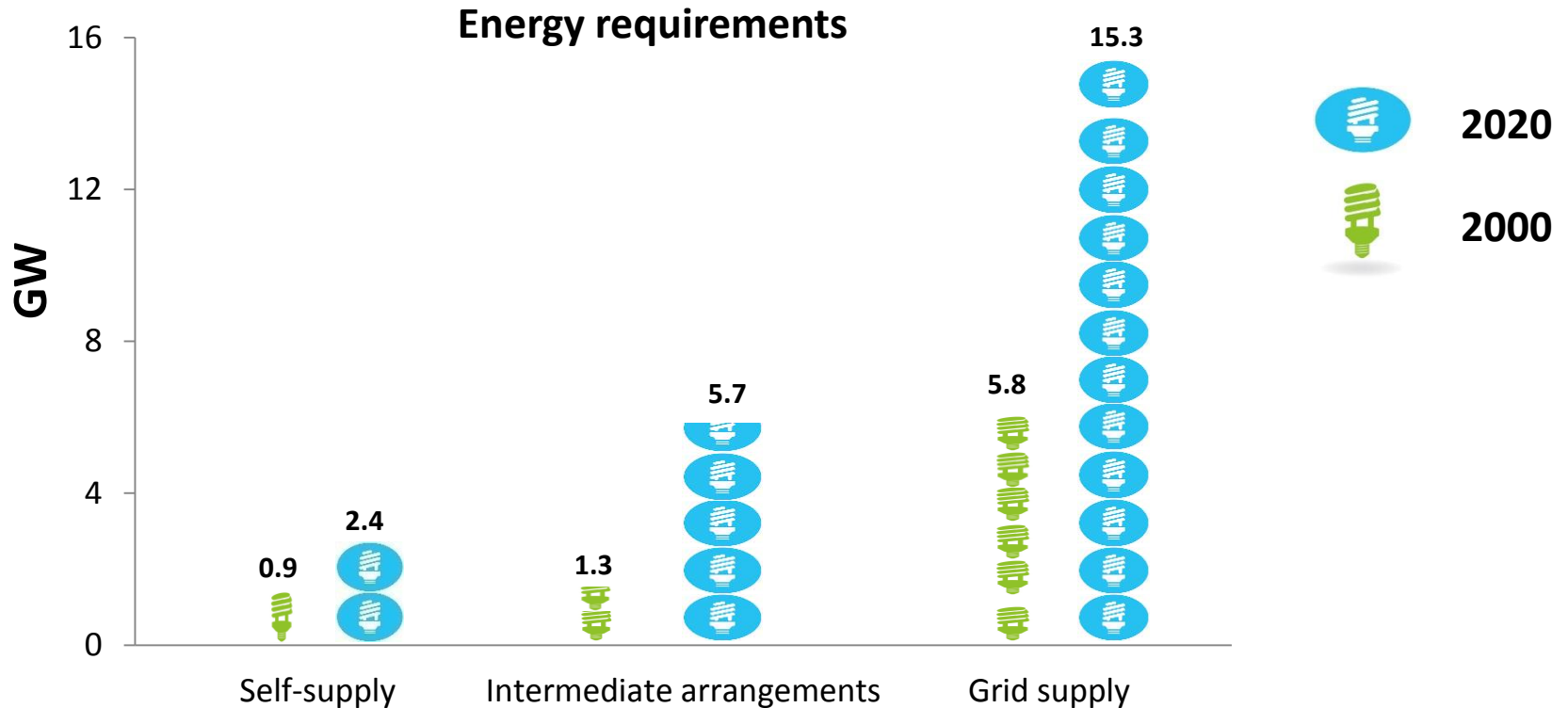
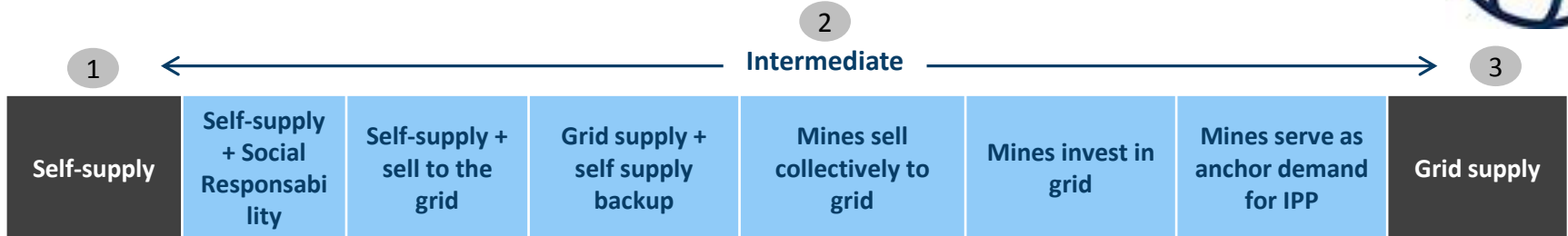


***If all SSA's population had access to electricity by 2020 with triple level of today's consumption**

Mining and nonmining (residential, commercial, industrial) demand



Many models of power sourcing by mines



Self supply is a loss for all

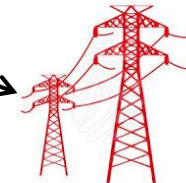


Mines:

High cost of electricity
Loss of competitiveness



Grid-connected customers



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

No electricity



Country:

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

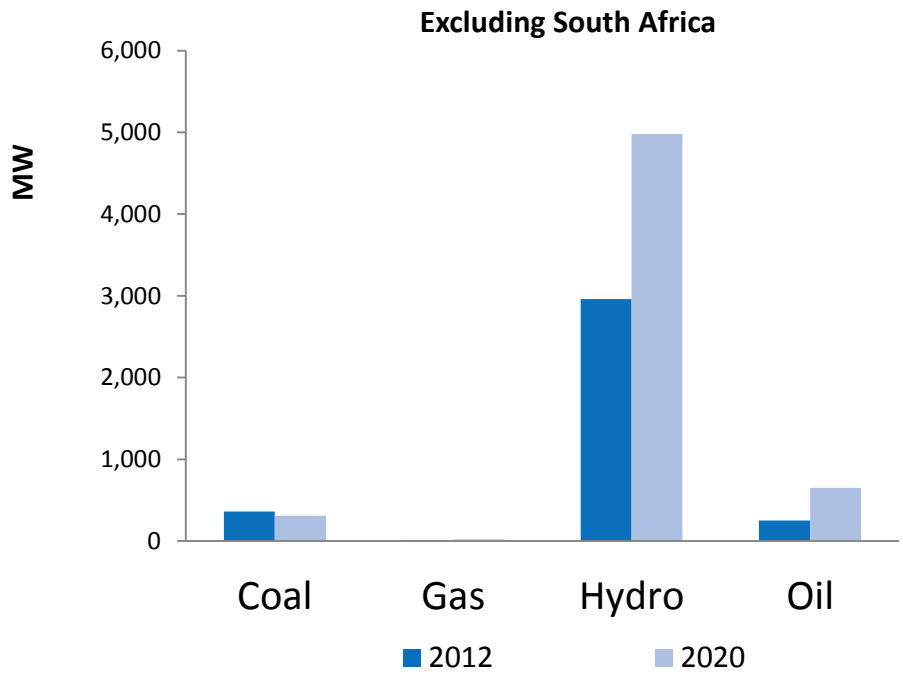
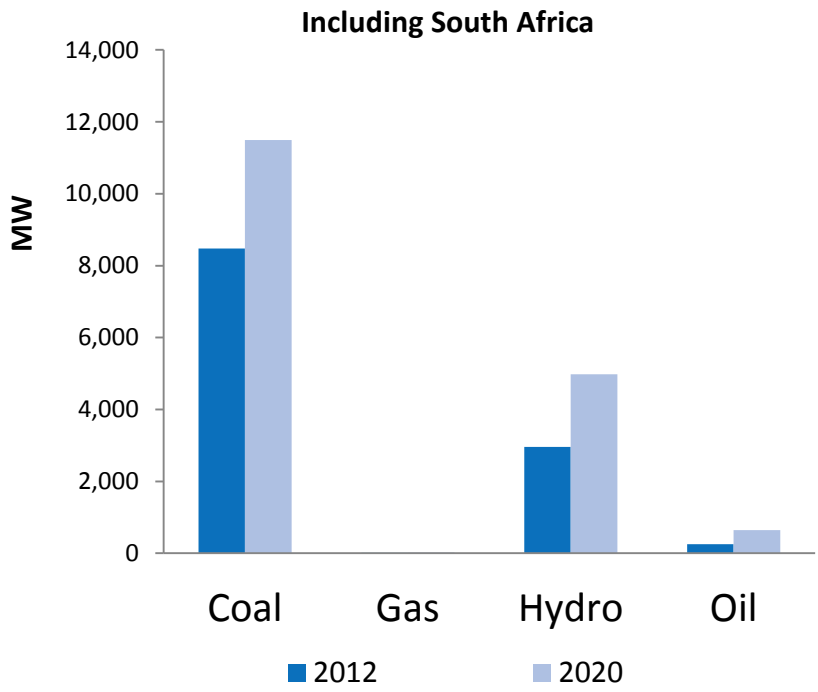


No electricity

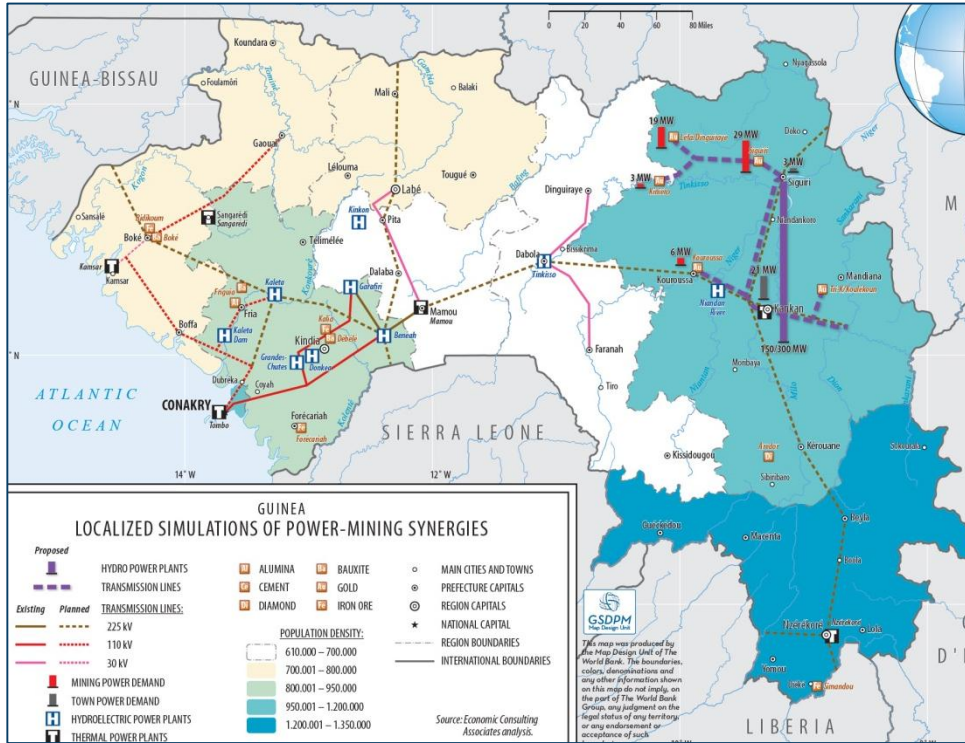
Mining demand for power can unlock clean energy in grid arrangements



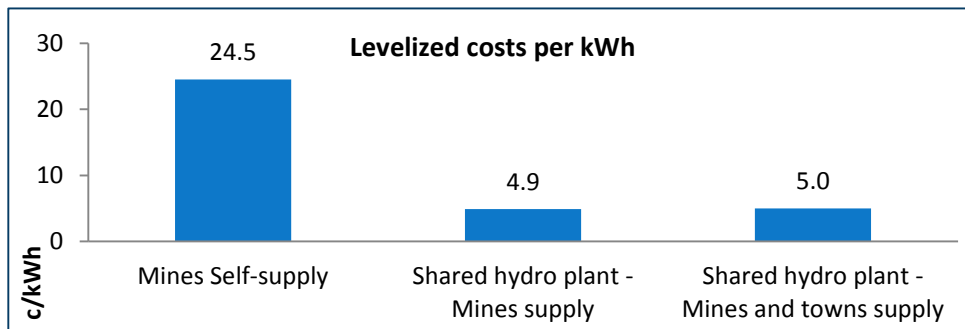
Source of power generation on grid-based arrangements



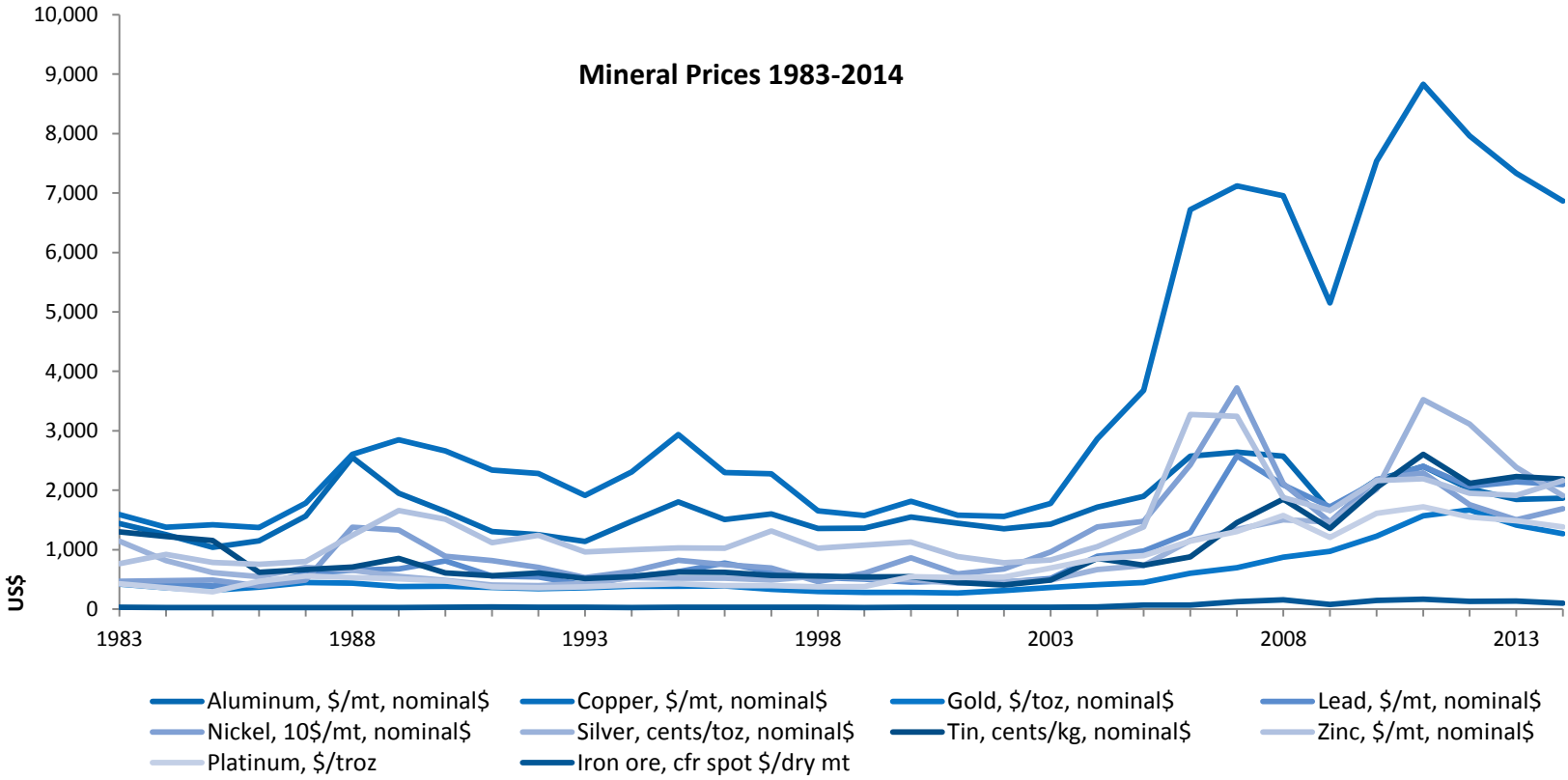
Mining demand for power can unlock clean energy in self-supply arrangements - Guinea



- 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



Commodity price volatility can destabilize mining demand for power



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

Future can be bright if we use this opportunity carefully





Thank You

Sudeshna Ghosh Banerjee

Senior Economist

sgbanerjee@worldbank.org

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