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Energy consumption standards and costs in South African gold and platinum mines

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UMECS – B4: NORTHAM

1 – What is the current mining depth level of the mine?
Shaft2124m; Expl level 2063m
2 - Which mining method is currently applied?
A standard breast- stopping mining layout with focus on the exploitation of ore metal by means of traditional drill and blast narrow tabular reef mining
3 – What is the degree of mechanization? (High, medium, Low)
Low or Semi conventional (hydro powered rock drills, water-jets, scrapers)
4 – Describe the operational chain of production? (Circuit and specific operation tasks)
-Mining: drilling, scraping and hoisting using skips
-Concentration: crushing, milling and flotation
-Smelting: drying using filter and furnace; smelting using converter and matte and converting
-Refining (BMR and PMR)
5 – Average production per shift, day, month, and year?
165000 tons per day or 3060000 tons per year of broken ores hoisted (2006) +90000 tons
6 – Average energy bought (paid) daily, monthly and annually?
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7 – Energy source type used by each mining operation activity if possible (Electricity, Diesel, Hydropower)?
Electricity is more used globally, diesel for locos and some alternatives of hydro power
8 – The peak (amount and period) achieved in energy consumption daily, and monthly per source type?
Electricity: 85 MVA daily

9- Global annual 2006 figures showing the amount of energy consumed per mining operational unit including:
- Production (loaders, loco, conveyor or haulage…):30MW
- Hoisting (main skips)
- Pumping, 16 to 20MW
- Ventilation fans, 7.5 MW
- Refrigeration, 12 MW
- Lighting 1MW
- Concentrator (crusher, mills, grinders…) 9 MW
- Smelting
- Refining

10 – What is the energy intensive areas and activities?
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11 – What is the load (charge) allocated in auxiliary services?
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12 - What is the power factor used for electricity in the mine and average price per KWh of electricity?
Power factor: 0.90
13 – Average material handled (ore, waste) per shift, day and month?
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14 – Average ore grade per tonne produced?

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15 – Is processing undertaken on mine site or far away and at which distance?