



ENERGY PRICING AS A COMPETITIVE TOOL FOR ATTRACTING MINING INVESTMENT

IMPROVING ENERGY DELIVERY TO THE MINING INDUSTRY

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SITUATION: MAJOR ENERGY USERS IN MINES

MINING:

Haulage

Dewatering

Hoisting (Vertical transport)

Ventilation

Refrigeration

Compressed air

PROCESSING

Crushing

Milling/Grinding

Agitation

Pumping

Heating

LV MOBILE FLEET

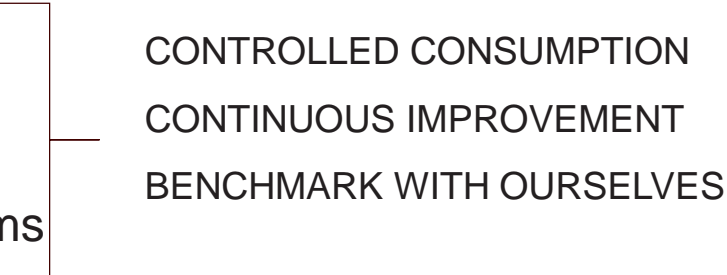
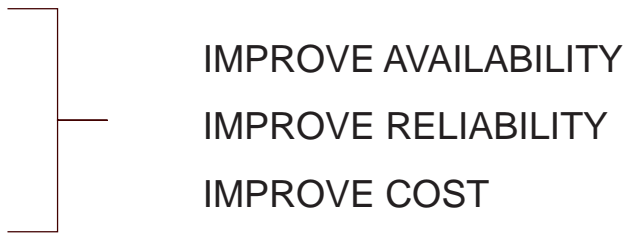
POWER GENERATION (BACKUP)



SITUATION : KEY SOURCES OF ENERGY FOR MINING OPERATIONS

- Electricity from grid (Hydro, Gas, LFO, HFO, solar)
- Electricity from the emergency backup system (LFO)
- Diesel for Mobile fleet
- Natural Gas
- Refrigerants
- Renewables
 - Solar

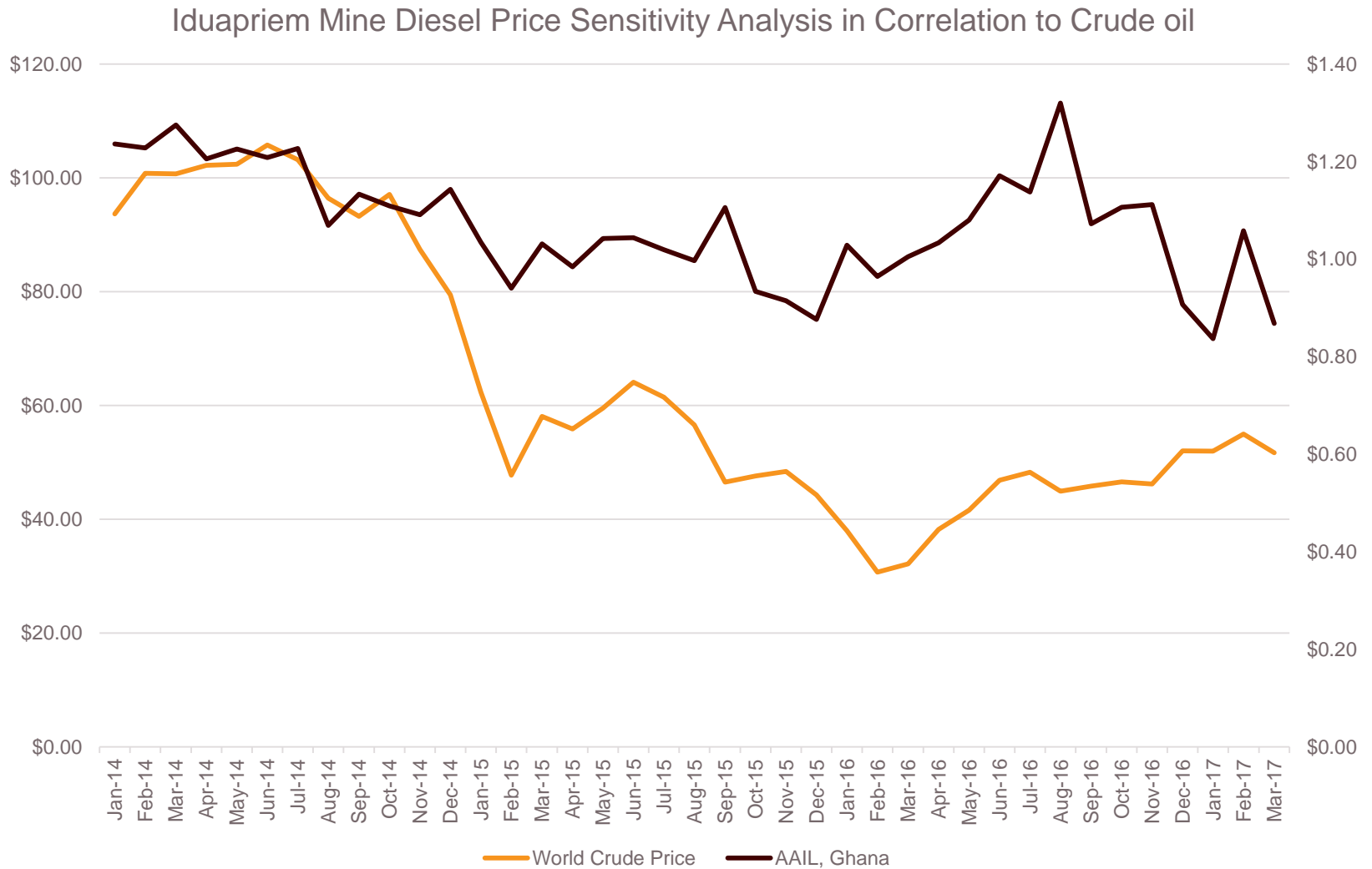
SITUATION: ENERGY POSITION (CASE STUDY- AGA)

- Globally, 15 - 40% of Operating Budget is spent on Energy
 - e.g.. USD \$ 681m (i.e.. 20% Of Operating Cost)
 - 70% Represents Fixed Assets
 - 30% Mobile Fleet
- Attempts of Energy Management implemented by all mines:
 - Demand Side Management
 - Behaviors
 - Processes
 - Management Systems
 - CONTROLLED CONSUMPTION
 - CONTINUOUS IMPROVEMENT
 - BENCHMARK WITH OURSELVES
 - Supply Side Management (interaction with sector players)
 - Generation
 - Transmission
 - Distribution
 - IMPROVE AVAILABILITY
 - IMPROVE RELIABILITY
 - IMPROVE COST

CONCERN

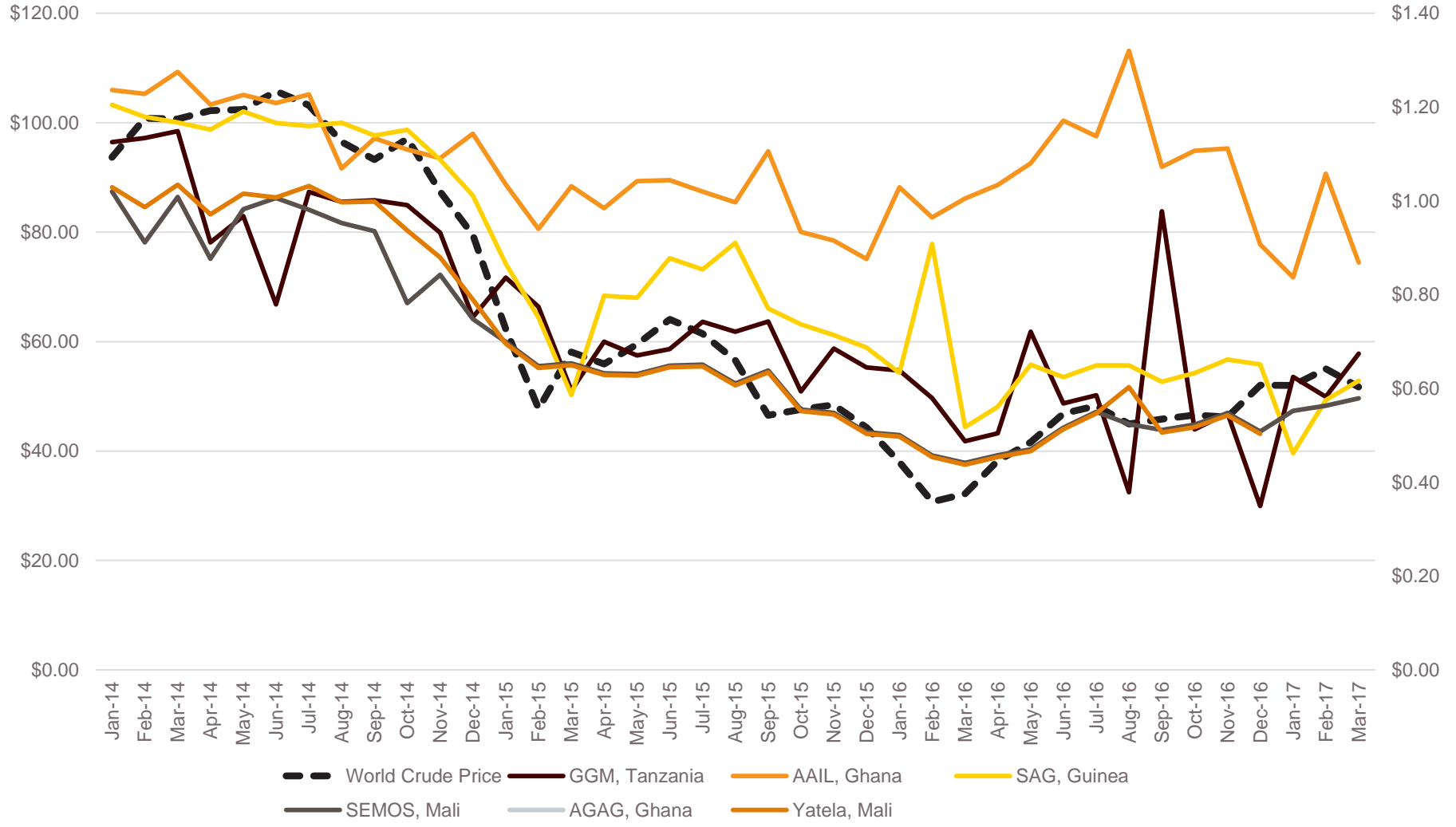
- Increasing difficulty in achieving further gains in efficiency improvement
- Decreasing availability and reliability levels of energy (Electricity) supply.
 - E.g. Goldfields opting out of the grid with a self-Generation IPP
- Uncertainty of cost of energy over the LOM. (about 4-5times higher than the global grid electricity price)

CONCERN: IDUAPRIEM DIESEL PRICE SENSITIVITY ANALYSIS IN CORRELATION TO CRUDE OIL (SSM)



CONCERN: HISTORICAL PRICE COMPARISON BETWEEN CONTINENTAL AFRICAN MINE COUNTRIES (SSM)

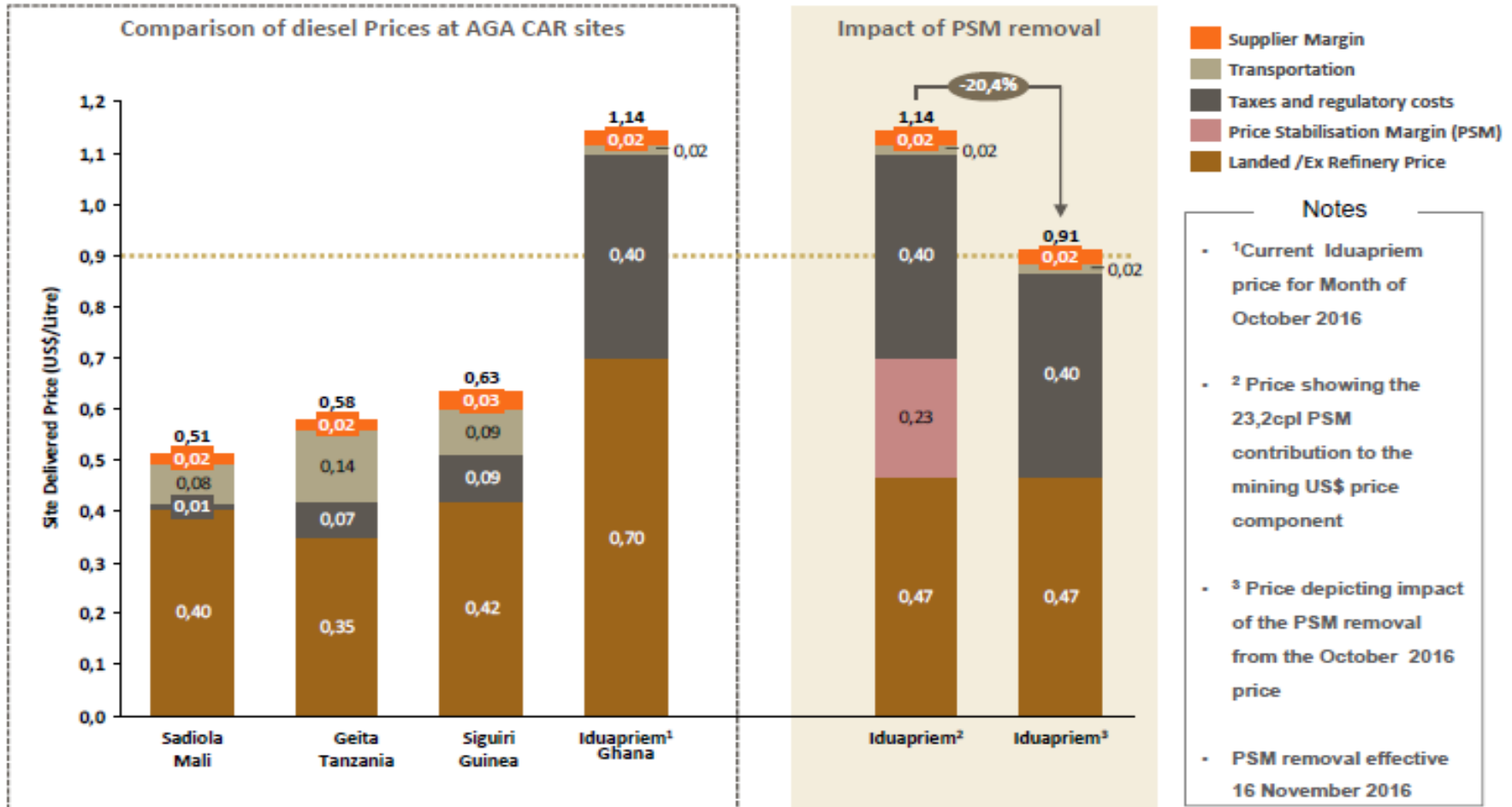
Historical Price Comparison between Continental African Countries



CONCERN: DIESEL PRICE COMPARISON AT THE CONTINENTAL AFRICAN MINE LEVEL (SSM)

October 2016 Diesel Price Comparison

Iduapriem's price is currently the highest at US\$1.14/litre...

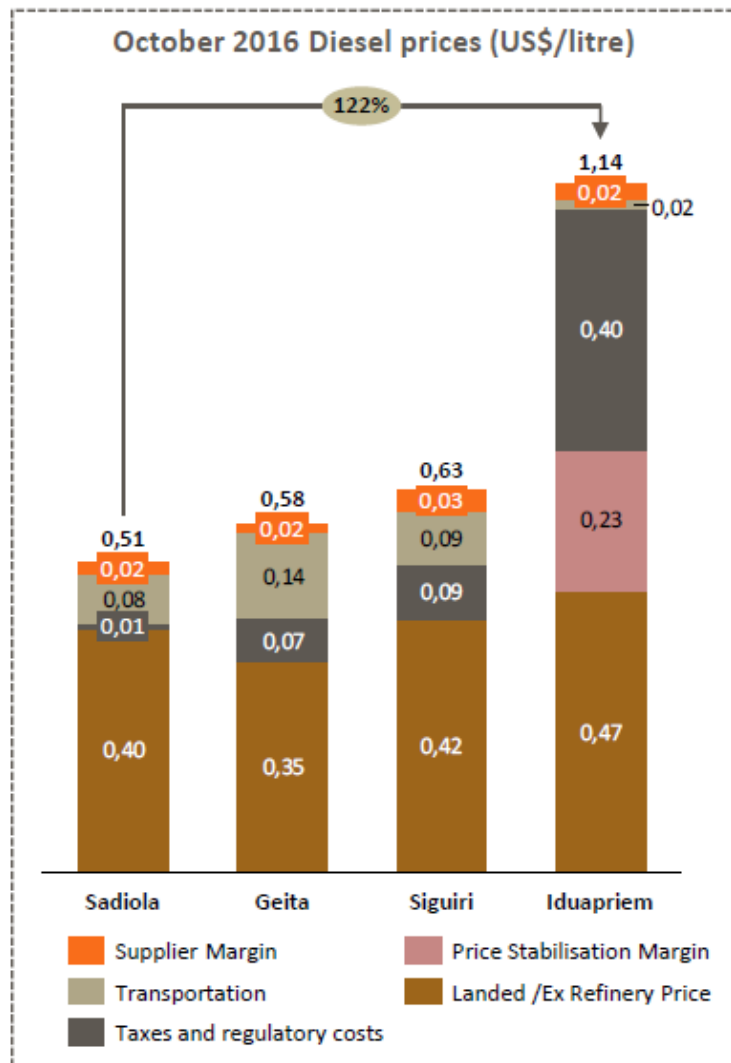


Source: AGA, NPA

...and will still remain so after the removal of the Price Stabilisation Margin (PSM).

CONCERN: BUILDUP ON FUEL FOR THE CONTINENTAL AFRICAN REGION (CAR)

Taxes form a significant portion of Iduapriem's fuel price build-up...



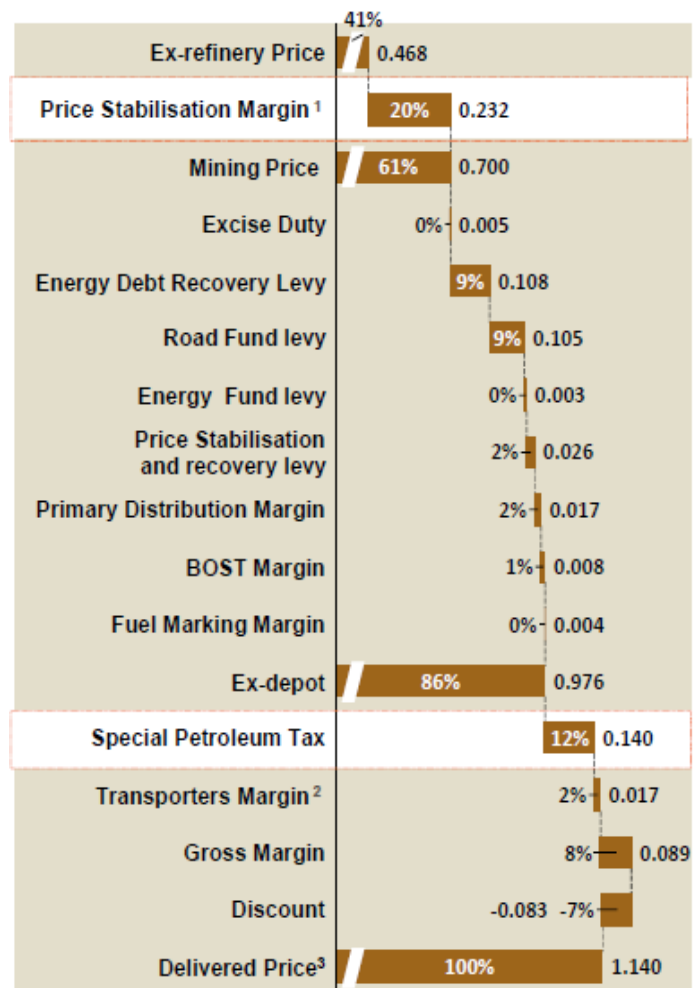
Source: AGA, NPA

Price Element	Commentary
Landed/Ex-Refinery Price	<ul style="list-style-type: none"> The US\$ price per litres of diesel from an international refinery, which includes transportation of the product from the refinery, insurance against losses at sea to land the product on the destination country shores. Low variation between the countries Senegal (40cpl) Tanzania (35cpl), Guinea (42cpl), Ghana (47cpl)
Taxes and Regulatory costs	<ul style="list-style-type: none"> Includes all taxes and levies imposed by the government and regulatory bodies Ghana has the highest tax component at a staggering 134% of the Ex-refinery price (Oct 2016) The two major components of the Ghana fuel taxes are the price stabilisation margin and the Special Petroleum tax (17.5% of the ex-depot price)
Transportation	<ul style="list-style-type: none"> Transportation in Ghana is regulated by the Unified Petroleum Price Fund (UPPF) 2cpl reflects the relatively short distance from Takoradi to Tarkwa (89km)
Supplier Margin	<ul style="list-style-type: none"> The supplier margins for all the sites are comparable Though the fuel market is liberalized in Ghana, the diesel price to mines is regulated by the government

...as it is not exempt from any taxes like other CAR sites.

CONCERN: DETAILED PRICE BUILDUP ANALYSIS FOR IDUAPRIEM MINE

The impact of the Price Stabilisation Margin and Special Petroleum Tax...



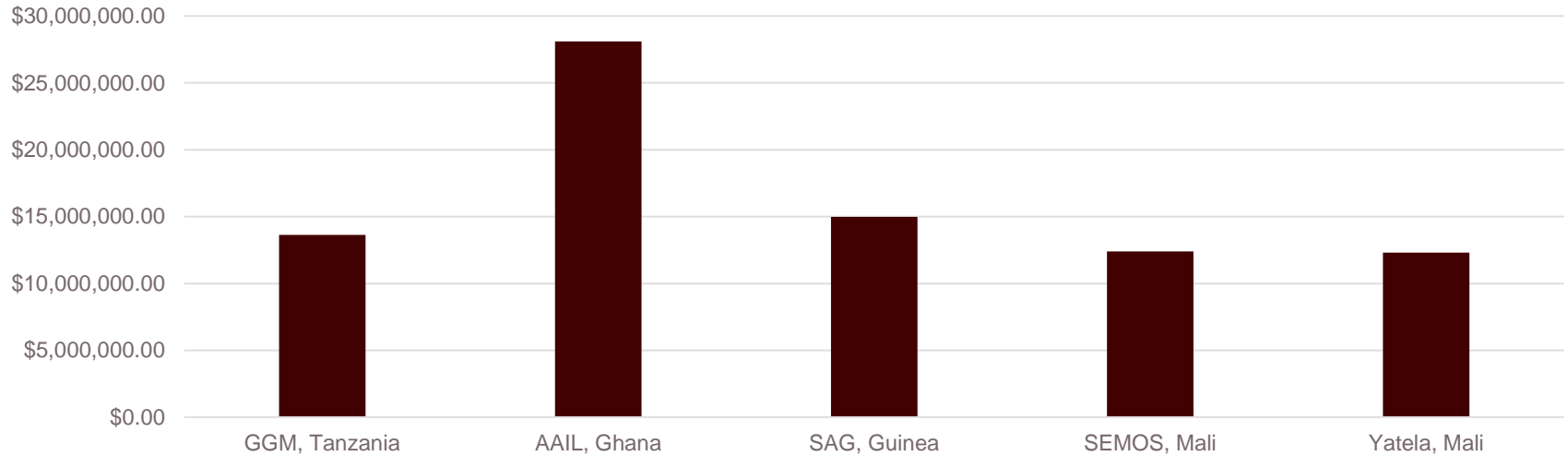
Item	Description
Ex-Refinery Price	The cost of importing crude oil, refining it at the Tema Oil Refinery (TOR) or importing already finished petroleum products into the country.
Excise Duty	A specific tax that goes straight into the Government's Consolidated Fund.
Energy Debt Recovery Levy	Levy to cover the debt incurred to purchase fuel for the electricity sector
Road Fund Levy	A specific tax to support Government's contribution to the development of new road infrastructure and the maintenance of the country's road network.
Energy Fund Levy	A levy to support the development of a national institutional capability of Energy Commission.
Price Stabilization and Recovery Levy	Levy intended to manage the impact of prices of International petroleum products on local ex-pump prices.
Primary Distribution Margin	Margin used to pay for the movement of Bulk product from one depot to another It was primarily used for paying for moving product from TOR to Takoradi.
BOST Margin	This is the money provided to the Bulk Oil Storage and Transportation Company (BOST) for the bulk storage of products and wholesale to the Oil Marketing Companies
Fuel Marking Margin	Collected for the purpose of policing the abuse of products through adulteration and related malpractices.
Ex-Depot	Sum total of Ex-REFINERY and all the ABOVE TAXES
Special Petroleum levy	The Special Petroleum levy forms part of tax measures adopted by government to increase revenue generation and improve efficiency on revenue collection

³ October 2016 Idupriem delivered price is equivalent to \$1.14/Litre
Currency Rate of Exchange GHc/USD = 3.8

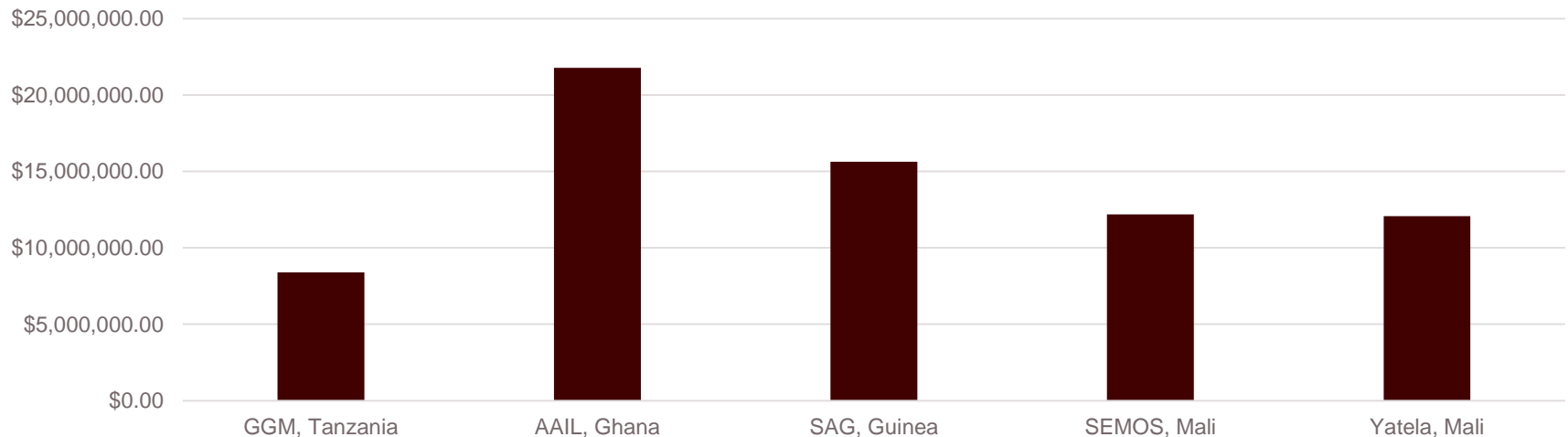
- Idupriem mine is not exempt from any of the fuel taxes

CONCERN: IMPLICATION OF HIGH FUEL COST IN RELATION TO OTHER CONTINENTAL AFRICAN MINES

Cost of 2,000kL/month for a year used at each of the CAR Region (6/2016)



Cost of 2,000kL/month for a year used at each of the CAR Region (12/2016)



CONCERN : KEY FACTORS FOR ATTRACTING MINING INVESTMENT (RISKS)

- Capital dilemmas - Capital Allocation and access (Competing with others in the sub-region for same Capital)
- Social license to operate
- Price and volatility of the Commodity
- Proximity to good Infrastructure. Transport, Roads, ports, highways etc.
- **Energy (Uncertainty of availability, reliability and cost of energy over the entire mine life)**
- Skills
- Pressures from financiers and insurers over transparency in operations, contracting processes, mines sites closures etc. pushes mines to effectively manage social and environmental footprints
- Depleting grade of ore deposits
- Tax regimes
- Political stability
- Delays in receiving permits due to bureaucratic and other issues
- Etc.

WAY FORWARD

.....creating strategic enabling environment

- **Mining industry is vital to daily life : As a result its opportunities, Challenges, investments and needs are inseparable from those of the broader society such as**
 - Employment generation
 - Increased wealth
 - Responsible stewardship of the nations' natural resources

- **Consequence on the absence of any of the above:**
 - Business confidence dips
 - Capital flight from the country
 - Reduction in taxes and Royalties received by Government from the mining industries.
 - Sub-Saharan Africa has already started experiencing cost-cut pattern which forces mines to scale back on capital investment, schedules etc.

WAY FORWARD

.....to reverse the trend

- Ensure Operations have Energy Security over their Anticipated LOM
- Proactively Manage Energy Costs
 - *(i.e. \$/KWh, \$/ton, \$/Oz)*
- Predictability in energy pricing.