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The Downstream Gas Sector:

REQUIREMENTS FOR INVESTMENT IN DISTRIBUTION INFRASTRUCTURE

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Content

The Downstream Gas Sector Opportunity

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A small but growing Commercial & Industrial Sector requiring

- Competitively priced fuel for heating and motive energy
- Greener alternative to Fuel Oil (RFO)

Key features

- West Africa wide market
- Both industrial clusters and remote/isolated facilities
- Creditworthiness superior to power sector
- Delivered price of natural gas could be lower than existing fuels

The Challenge

- Infrastructure to be developed
  - Gas distribution network
  - CNG/LNG supply infrastructure

  => *Capital Intensive*
- Undeveloped Market
  - Demand yet to be unlocked
- Limited ancillary/support service providers
- Uncertain regulatory and legal environment
  - Gas distribution monopoly vs Retail competition
  - Safety compliance requirements unclear

Opportunity and Challenge

- Downstream gas sector provides an attractive business opportunity for prospective gas suppliers and service providers
- Significant capital investment is required up front
- Market must be nurtured and developed.
- Limited human resource and ancillary service providers.
- Legal & regulatory environment unclear.

Unlocking the Opportunity

JUSTIFYING LONG TERM INVESTMENT IN REQUIRED INFRASTRUCTURE

1. Developing the downstream gas market

Market Development: Realising Demand

- Latent/Suppressed Demand => Effective Demand
  - Market survey
  - Feasibility analysis
  - Customer recruitment and commitment
    - Incentives for conversion to natural gas?
  - …
  - Investment in infrastructure

Market Development: Questions…

- Will findings of GoG sponsored market feasibility studies be made public?
- What is role of GoG in gas distribution?
- Open or restricted tendering for investors/operators?
- Will distribution market be open to competition?
- Will suppliers be able to source/import their own natural gas?
- Any incentives/support for customer conversion to natural gas?

Market Development: Market Structure

Potentially three sectors:

1. Pipeline Distribution Zones
2. CNG/LNG Supply Operations
3. Gas Export Operations

Pipeline Distribution Zones

- Must be clearly defined and delineated
- Infrastructure development and operation – monopoly operation
- Gas retail sale – monopoly or competitive
- 3rd Party Rights to supply CNG/LNG within Zone – Permitted or Denied
- Key Regulatory requirements:
  - Safety
  - Abuse of Monopoly
  - Unfair competition (where applicable)

CNG/LNG Supply Operations

- Rules of Engagement must be clear
  - Allowed zones of operation – Unrestricted or pre-defined
  - Rights on arrival of piped gas
- Retail Model
  - Limited/Unrestricted Competition for market
  - Concession defined licensing
  - Licensing specific to CNG/LNG or to gas supply without restriction

Export Operations

(Assumed to relate to LNG tanker operations)

- Ghana's Gas Hub Vision
  - Facilitate meeting of small gas demands in sub-region
  - Breaking bulk: Receive supply from large LNG tankers and supply smaller demands by land or sea.
- Issues
  - Right to source own gas whilst excess gas contracted in Ghana
  - Tax issues related to transit of gas in Ghana
  - Licensing/permitting requirements (if no sales in Ghana)

Unlocking the Opportunity

JUSTIFYING LONG TERM INVESTMENT IN REQUIRED INFRASTRUCTURE

2. Enhancement of Business Environment

Chicken or Egg?

- Which should come first: Jobs or Trained Personnel?
  - In absence of jobs, trained personnel will move in search of jobs…
  - Service providers will not invest in service nobody requires…
  - In absence of personnel or services, investors will import what they require.

General Requirements

- Trained professionals
  - Pipeline engineers
  - Qualified welders
  - HSE professionals
- Knowledgeable Service Providers
  - Legal support
  - Insurance providers
  - Boiler/Vehicle conversion service providers
- General Suppliers
  - Meters
  - Pipes & fittings

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JUSTIFYING LONG TERM INVESTMENT IN REQUIRED INFRASTRUCTURE

3. Clarity of Regulatory Framework

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Pipeline Distribution Concessions
Monopolies vs Retail Competition

Regulated Monopolies

- Distribution Infrastructure
  - Single Operator (monopoly)
  - Regulated service charge
  - 20+ years concession
- Gas purchase and sale
  - Single Operator (monopoly)
  - Regulated sales tariffs
  - 20+ years concession

Retail Competition

- Distribution Infrastructure
  - Single Operator (monopoly)
  - Regulated service charge
  - 20+ years concession
- Gas purchase and sale
  - Multiple Operators
  - Competition for customers
  - 5+ years license term

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CNG/LNG Supply Operations

- Key Decisions
  - Nationwide vs Zoned licensing
  - Multiple Monopolies vs Retail Competition

- Supported Business models
  - Integrated CNG business (Compressor station + BRVs)
  - BRV providers (transportation only) + Compressor Station operator/CNG Supplier

Export Operations

- Regulatory Issues
  - Tax/Customs issues related to transit of gas in Ghana
  - Licensing/permitting requirements (if no sales in Ghana)
  - Right to source own gas (whilst excess gas available in Ghana)?

Conclusions

- Clarity of Information is Key
  - Government Policy and Agenda
  - Opportunity provided for private sector
  - Regulatory constraints to be imposed
  - Incentives to be provided (if any)

- Greatest value for money achieved with
  - Transparency
  - Level playing field for all
  - Optimal harnessing of market dynamics

Thank You