The Gas-to-Power Value Chain for Africa: making the ends meet

Presented by: Alain Rosier – Project Manager
USAID Africa Infrastructure Program

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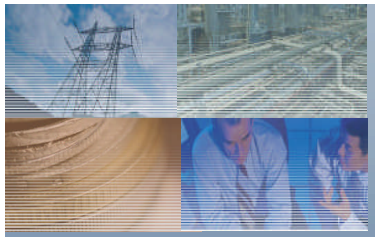
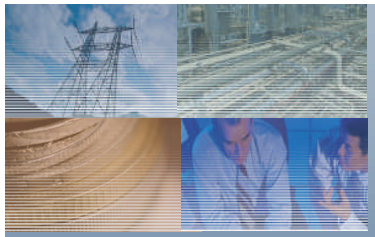


The Gas-to-Power Chain for Africa: making the ends meet

Presentation Outline

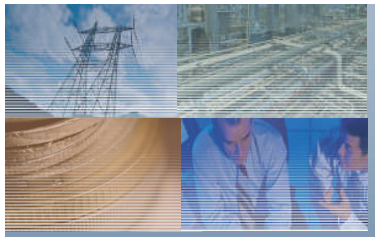
- Nexant in Africa: a brief reminder
- Gas to Power Chain: Players & Rules of the Game
- Identified Risks & Hurdles Encountered
- Addressing IPP Risks in Gas Supply, Gas Transport & Power Generation through Anticipation, Planning & Regulation



Nexant in Africa - Main Interventions

- ***West African Gas Pipeline***
- USAID-funded Technical Assistance to ECOWAS & Sponsor States (WAGP Authority) - Since 2000
- ***West African Power Pool***
- USAID-funded Technical Assistance to Power Pool Secretariat - Since 2005
- ***Southern Africa Power Pool***
- USAID-funded Technical Assistance to Power Pool Secretariat – 1999-2003 – Then WB & SAPP 2006-2008
- ***Kenya-Uganda Oil Product Pipeline***
- Transaction Advisor (2005-2007)

Nexant



Gas-to-Power Chain
The Players

CNL
SPDC
NNPC

N-Gas

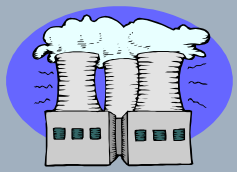
NGC

WAPCo

VRA
CEB
IPP's
LDC's

ELPS

WAGP



GAS PRODUCERS

GAS MARKETERS

GAS TRANSPORTERS

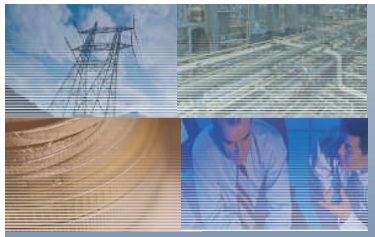
POWER PRODUCERS

NIGERIA

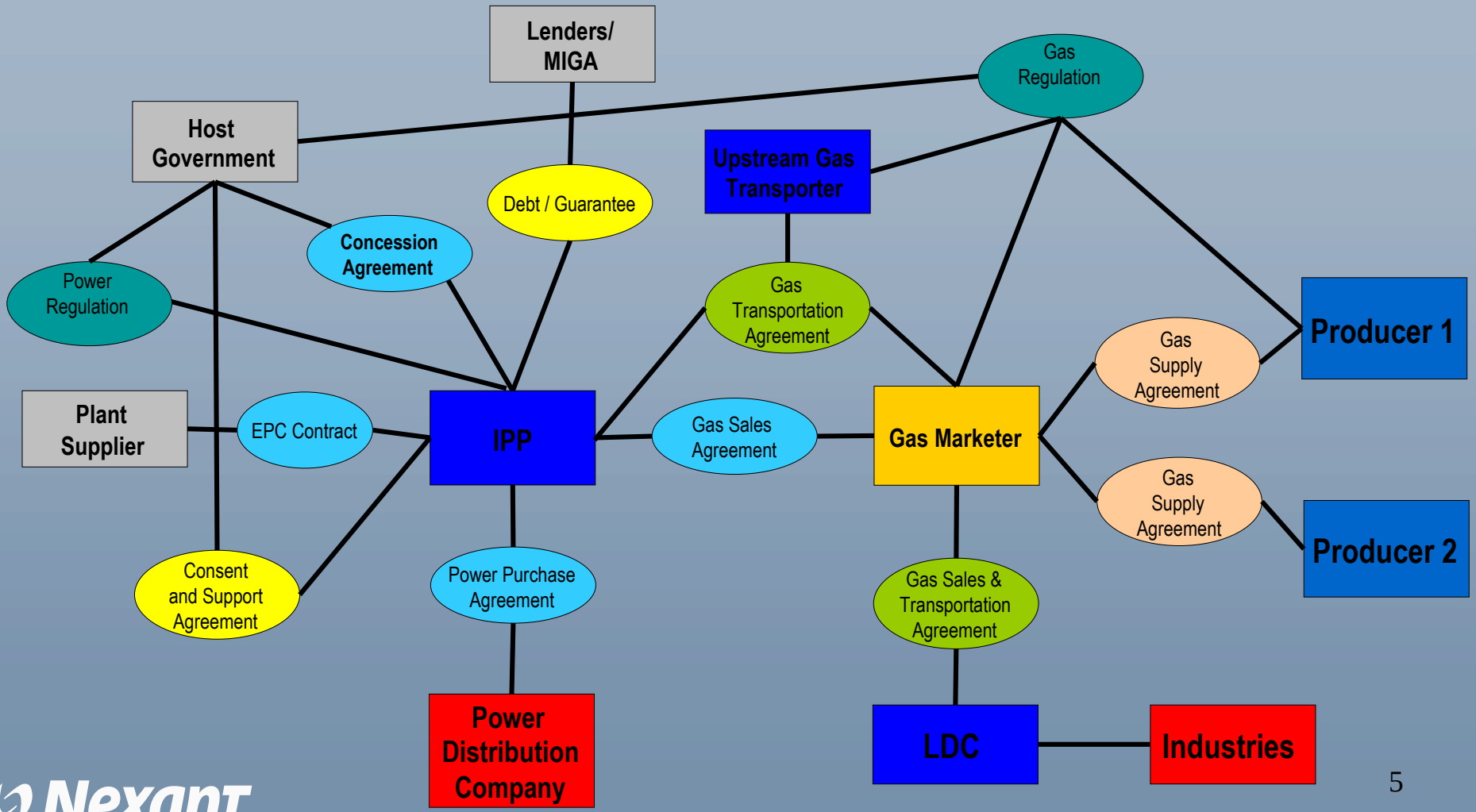
BENIN-GHANA
NIGERIA-TOGO

GHANA
TOGO
BENIN

Nexant



Gas-to-Power Chain
Rules of the Game: Contracts & Regulation



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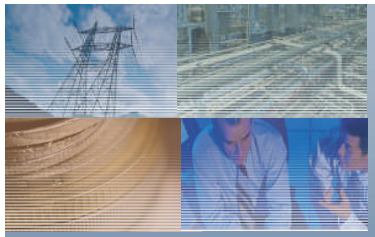
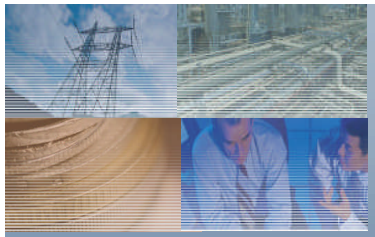


Gas-to-Power Chain

Usually Identified Risks

- Market: will demand be there: Consumers? IPP's?
- Construction: will cost & time be properly estimated?
- Enabling Environment: will it be robust, fair & timely?
- Commercial: will Contracts cover all issues? Will Risk Sharing be fair?
- Financial / Political: will Guarantees be enough?



Gas-to-Power Chain
Case of West African Gas Pipeline

Encountered Hurdles

RISKS IDENTIFIED AT DEVELOPMENT STAGE : Mixed Results

- Power / Gas Demand: much higher than expectations : between +100% and +200%
- Pipeline Construction: Delay in Completion Date & Cost Increase leading to ROR substantial deterioration
- Power Plants EPC: early initiation leading to stalled projects except few benefitting from independent supply.
- Enabling Environment: has not delayed financial closure (WAGP);
- Commercial Contracts: late signing; Liquidated Damages far from covering extent of actual damage;
- Partial Risk Guarantee: not called so far (WAGP)

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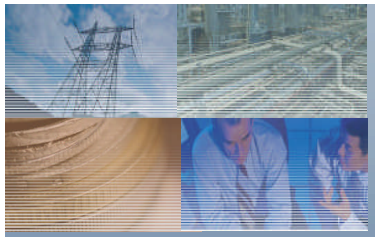

The Gas-to-Power Chain Case of West African Gas Pipeline

Encountered Hurdles

RISKS NOT IDENTIFIED AT DEVELOPMENT STAGE

- Gas Supply: combined adverse effects of Higher Domestic Demand and Lower Gas Availability
- Gas Quality: issue of water content & gas drying
- Transportation Bottlenecks
  - WAGP Capacity: increase by stages requires signing GSA
  - ELPS Capacity: market growth faster than time for expansion
  - Gas National Grid yet to be integrated: gas supply by Third Parties to WAGP at stake
- Niger Delta Issues

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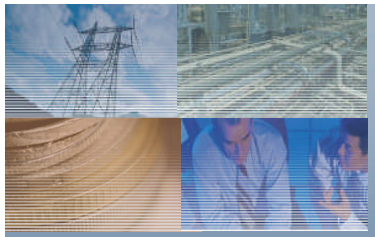

Gas-to-Power Chain
Case of West African Gas Pipeline

Challenge # 1 : Gas Supply vs. Demand

- Overall Demand exceeds Supply Capacity (Nigerian Gas Master Plan – domestic, year 2011)
  - Domestic Power Demand : 4,5 Bscfd for 11,000MW
  - Domestic Industrial Demand: up to 5,5 Bscfd
  - Supply Capacity: 4,5 Bscfd
- Benin, Togo & Ghana Demand: 0.7 Bscfd
- AG: new treatment plants should be built – 1.2 Bscfd opportunity – 2 to 3 years cycle
- NAG: new gas fields should be developed - Exploration/Production 3 to 5 years cycle

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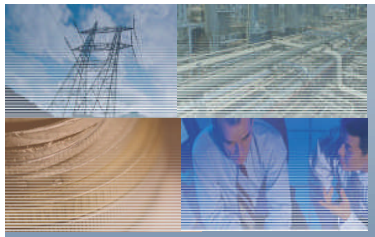

Gas-to-Power Chain
Case of West African Gas Pipeline

Challenge # 2: Gas Transportation

- WAGP Capacity already too small for Demand
- Nigerian Western Gas Network (ELPS) needs Expansion
- Nigerian National Network needs Integration
- Theoretically, Investments should come naturally from market pressure, assuming gas is there
- Practically, uncertainties along gas chain add up and are concerns to investors in Gas Transportation

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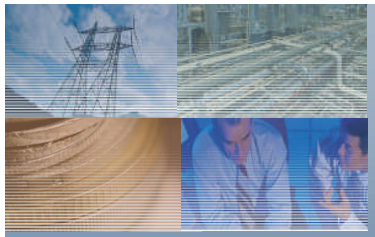

Gas-to-Power Chain
Case of West Africa

Challenge # 3: Generation Plants

- There was a Plant Shortfall: barely any new Power Plants built in Benin, Togo and Ghana over 10 years
- 8 to 10 projects – for a total of 3000 MW – initiated or contemplated in the last 2 years in Benin, Ghana & Togo
- Similar situation in Nigeria: 20 new projects for 12,000MW
- Lack of Generation Plant no more main challenge but most projects stalled due to lack of available gas

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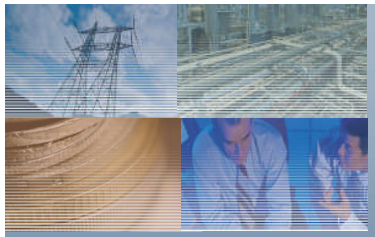

Gas-to-Power Chain Lessons Learnt

Addressing Challenges: Anticipation

- Players must anticipate weak links in Gas-to-Power Chain
- Investors should not expose early capital expenditure to risk: instead, extensive use of conditions precedent is recommended to save time and money
- Regulators must anticipate market reactions; potential conflicts should be carefully addressed ahead of time
- National Planners must consider acting in Anticipation of the Market development: address weak links or the whole chain will suffer

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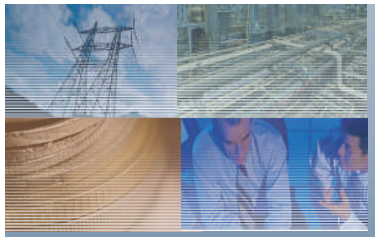
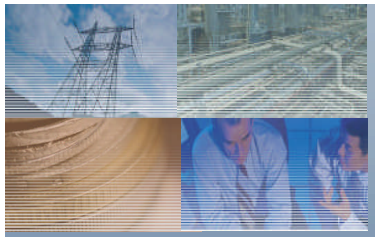


Gas-to-Power Chain
West Africa, Lessons Learnt

Addressing Challenges: Planning & Regulation

- Major Issue today: Lack of Available Gas
- Major Remedy: Appropriate Regulation to attract investments in Flared Gas Treatment, Gas Exploration/Production & Gas Transportation – Nigerian Gas Master Plan; Ghana Gas Utilization Plan
- Consolidation of Gas-to-Power Chain: a few remedies
  - Use of IPP Licensing and PPA for Quantitative Regulation
  - Clarify Gas Curtailment Rules
  - Dual Fuel: addressing financial shock in Tariff setting
  - Build Missing Transportation Links
  - Create transparent Transportation Tariff on National Gas Grid
  - Warning: unbundling creates more links



Gas-to-Power Chain

CONCLUSION

- A Chain is always weaker than its weakest link
- Each link adds its own Risk to the Chain
- ALL links must be considered from Gas Supply to Power Demand
- Overall Risk is reflected in the ROR, hence in the Tariffs. Stakeholders, incl. Governments can contribute to mitigating Overall Risk through Anticipation, early Planning and appropriate Regulation

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