Market rules for efficient operation. Dealing with security of supply concerns

TBI Office locations

- ● Gobal Headquarters
- ○ Regional Policy Hubs
- ■ Select Satellite Offices

AGENDA

01 Benefits of regional trade: the case of West Africa

02 How to achieve them

03 What are the main barriers

04 Topics for discussion

Benefits of regional integration: West Africa

An optimistic but achievable level of market integration where countries trade bilaterally until 2025 and a liquid market exists afterwards could collectively provide around $32 Billion of benefit to the region throughout the next decade

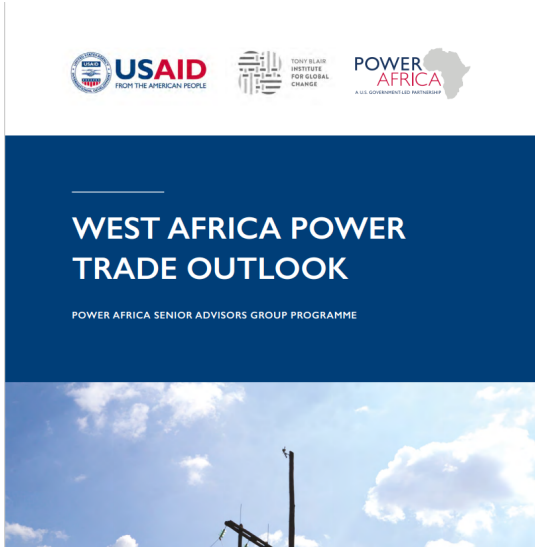
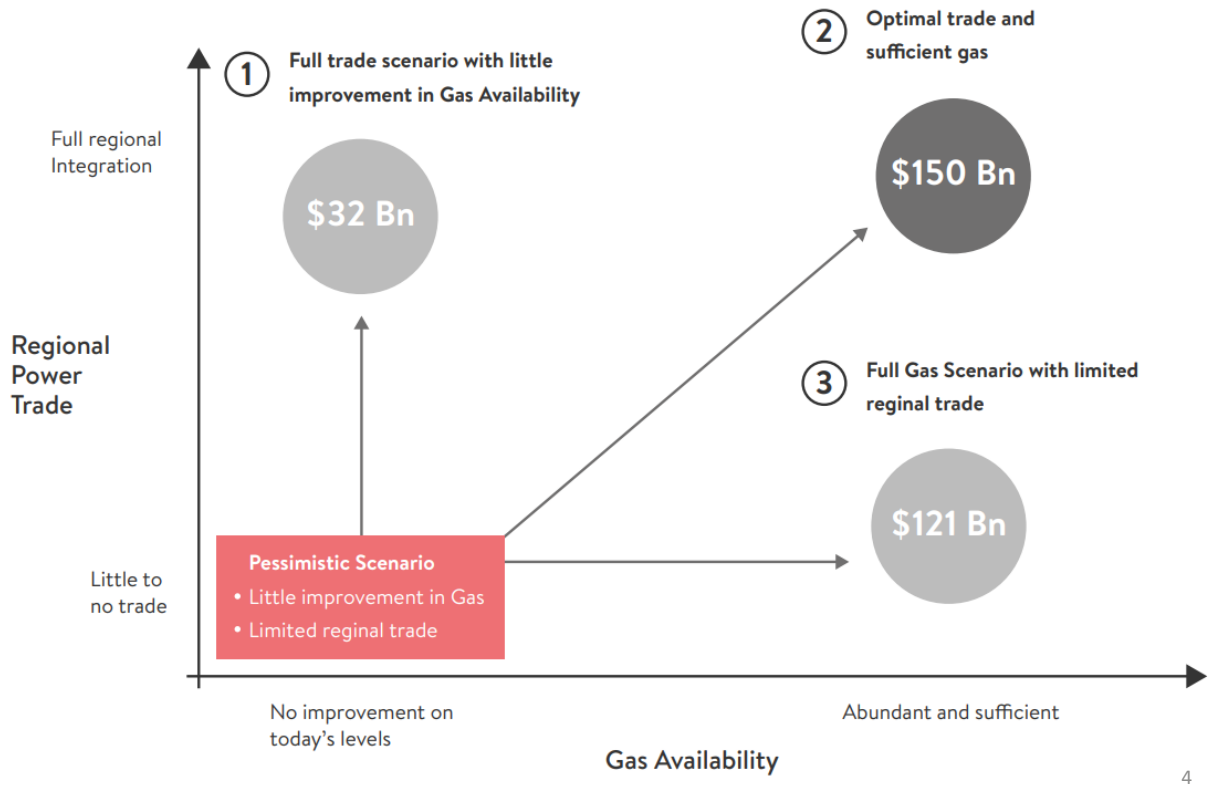


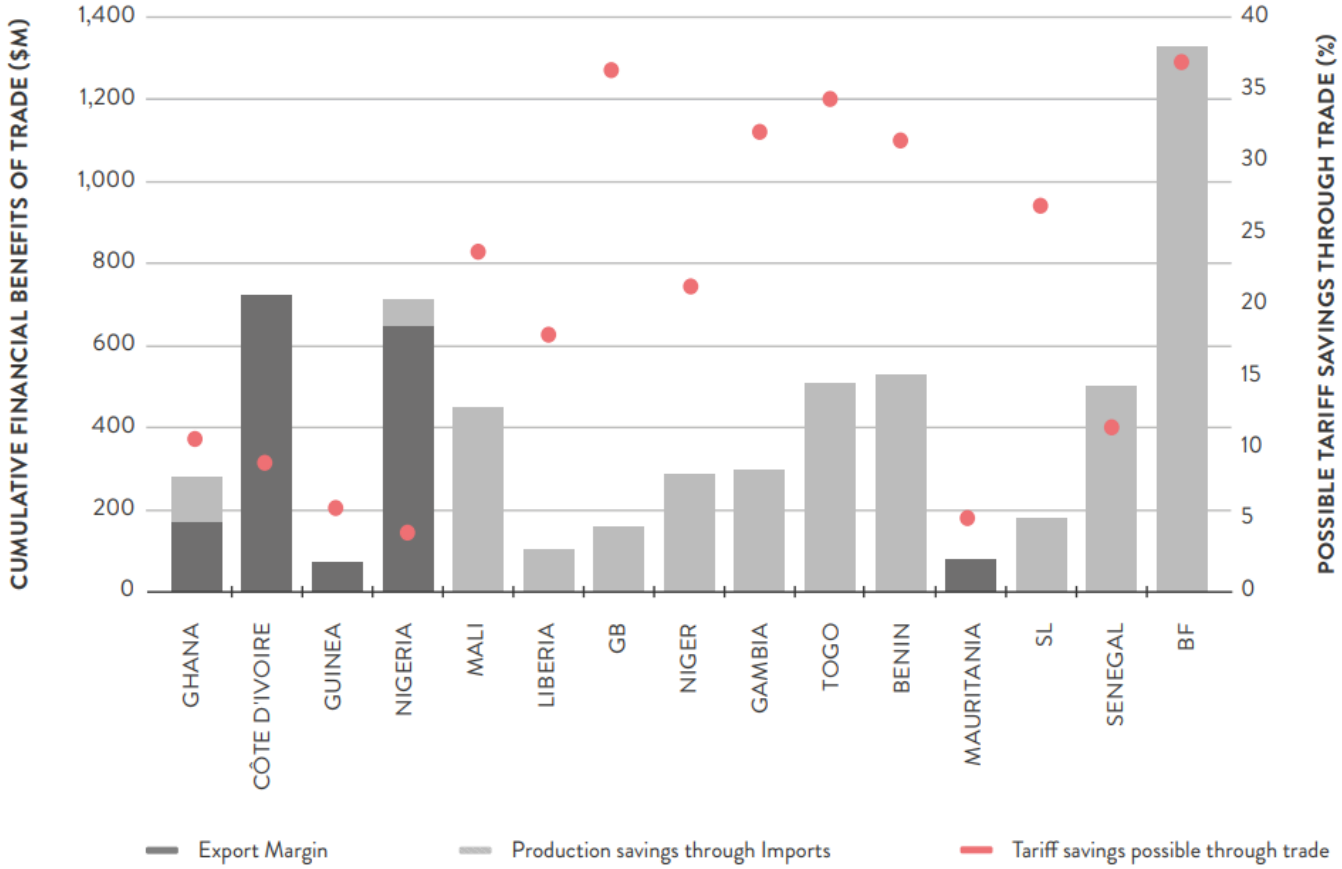
FIGURE 4: FOUR SCENARIOS FOR REGIONAL POWER TRADE AND GAS AVAILABILITY



ENGLISH West Africa Power Trade UK WHOLE LOW_1.pdf (institute.global)

Benefits of regional integration: West Africa

- Every country in the region will benefit from trade.
- Exporters such as Ghana, Côte d'Ivoire, Guinea and Nigeria will collect revenue from otherwise idle generation plants, whilst importer countries will replace costly liquid fuels with imports



Regional markets: what they should aim at

Single market paradigm: the outcome of the regional regulation should be as close as possible to a sound regulation for a single system of regional dimension

From granting visa to electrons

To a common space with no borders

How to achieve regional integration Harmonization of laws and regulations

- In practice, there is the need to strike a balance between the single system paradigm and national sovereignty
- national rules must be harmonized and aligned so that there is a common regulatory framework in the regional market
- Irrespective of the level of integration, the minimum set of harmonization process has to deal with

Technical rules

Capacity allocation

Regional transmission tariff

Compensation of losses

Normal development of regional Markets

Crawl

- Market Design
- Market Rules Development
- Basic Procedures development

Raise

- Several Procedures development
- Initial Functioning of the Market

Walk

- Market Fine-tune
- Design another markets of features

Run

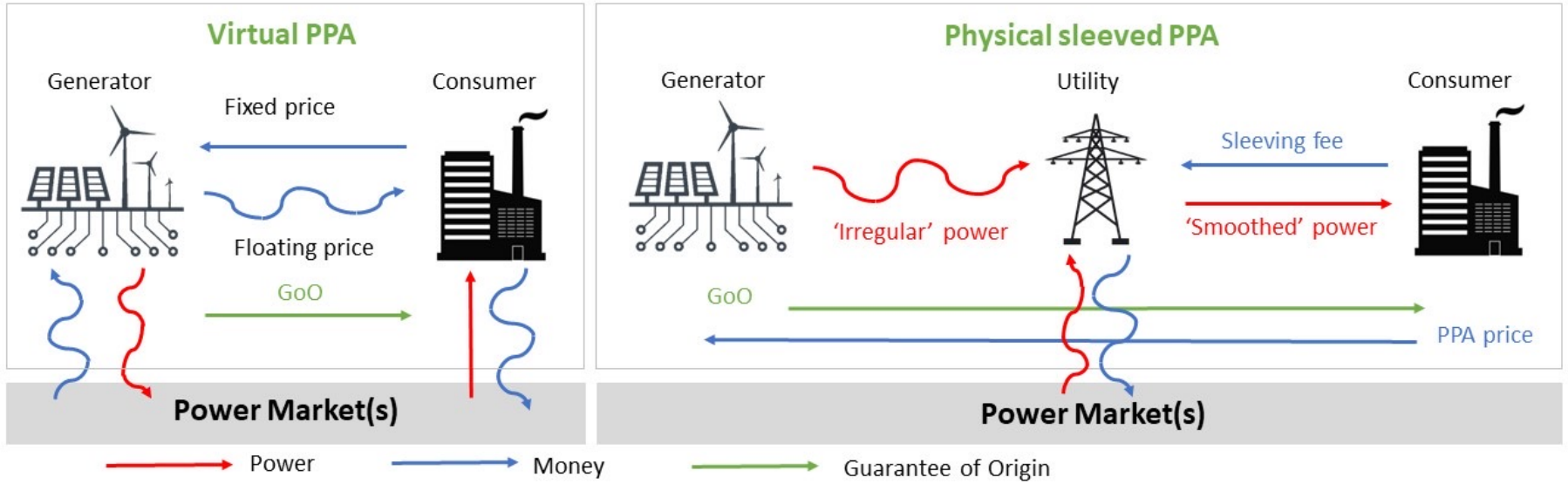
- Implementation of new markets of features.
- Financial Markets
- Ancillary Service Markets

The issue with bilateral contracts

- In all kinds of power system organisational structures, concerns about security of supply have led governments and market participants to engage in firm long-term physical bilateral contracts in the initial stages of international power trade. These contracts seem particularly attractive when there are frequent supply shortages due to insufficient investment in new generation and transmission.
- Both consumers and producers engage in firm long-term bilateral contracts as a means of reducing supply and demand risk for themselves. In addition, these contracts have long been viewed as necessary in order to obtain financing for investments in new power plants or energy-intensive industries, and to hedge against price volatility. In advanced regional power markets, these physical bilateral contracts have been replaced for the most part by financial contracts with multiple formats.
- In contrast, firm long-term physical bilateral contracts are prevalent today in cross-border power transactions in all African regional power pools despite the fact that, although these contracts can provide a high level of certainty regarding security of supply, they often result in losses of economic efficiency that could be avoided in most cases

Types of bilateral contracts

- Physical obligations require the physical use of designated infrastructure to fulfil the contract. This format puts the greatest constraint on the operation of the system but also guarantees that power will be delivered as promised if the contracted physical facilities are available
- Financial contracts, by contrast, only require exchanges of money and do not influence the physical operation of the system



Integrating financial contracts in bilateral trade (credits to prof. Arriaga)

- Two parties can sign a long-term contract (let's call it a "**priority financial bilateral contract**") for any desired energy pattern at a privately negotiated contract price, under specific conditions that provide financial hedging to both parties for the contracted energy pattern, as well as security of supply for the buyer and security of production for the seller if – and only if – the generator is available, the demand is able to consume and there is enough transmission capacity to hold the transaction that is either free to use or has been previously committed to the considered transaction.
- This can be achieved by combining the best features of the two basic types of contracts. The financial component consists of CfD. A standard CfD if the generator and the load are located in places where they are subject to the same price, which must be supplemented by another CfD to hedge the difference between the prices in the two locations in the more general case
- If the generator and the load are not subject to any obligation to sell or to purchase at any externally given price a CfD is not needed, and they just have to agree on the energy price. The priority financial bilateral contract will be ignored by the regional system operator except when the least cost regional dispatch of generation fails to meet all the demand in the country where the demand (i.e., the buyer in the contract) is located and therefore all the negative aspects of bilateral contracts will be avoided
- When the regional dispatch cannot guarantee that the supply in the country where the buyer is located is enough to meet all demand, the "priority feature" of the contract will be activated and – if the generator and the committed transfer transmission capacity are available – the supply of electricity to the buyer for the contracted demand pattern will be guaranteed

Points for debate

Preliminary suggestions

- How challenging will it be to move away from the existing physical bilateral contracts and towards a liquid spot market?
- Would significant resistance be expected to a least-cost dispatch solution?
- Typically, a contentious issue in power pools involving several countries has been trusting that firm power contracted with a generator located in another country will be supplied at times of deficit of supply in the region. Have you encountered this issue in your power pool? Do you have a suggestion on how this issue could be addressed?
- Harmonization of market rules across many different countries is challenging: different maturity of the markets, different size, different legal frameworks and norms. Can you share any lessons from your power pool / region?
- How is transmission capacity allocated in your region / power pool? What are the pros and cons? And how is this related to placing bids in the market (injection points, trading licenses, etc.)?
- Do you have an established mechanism to allocate the losses in transmission?

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