



Frankfurt School
FS-UNEP Collaborating Centre
for Climate & Sustainable Energy Finance

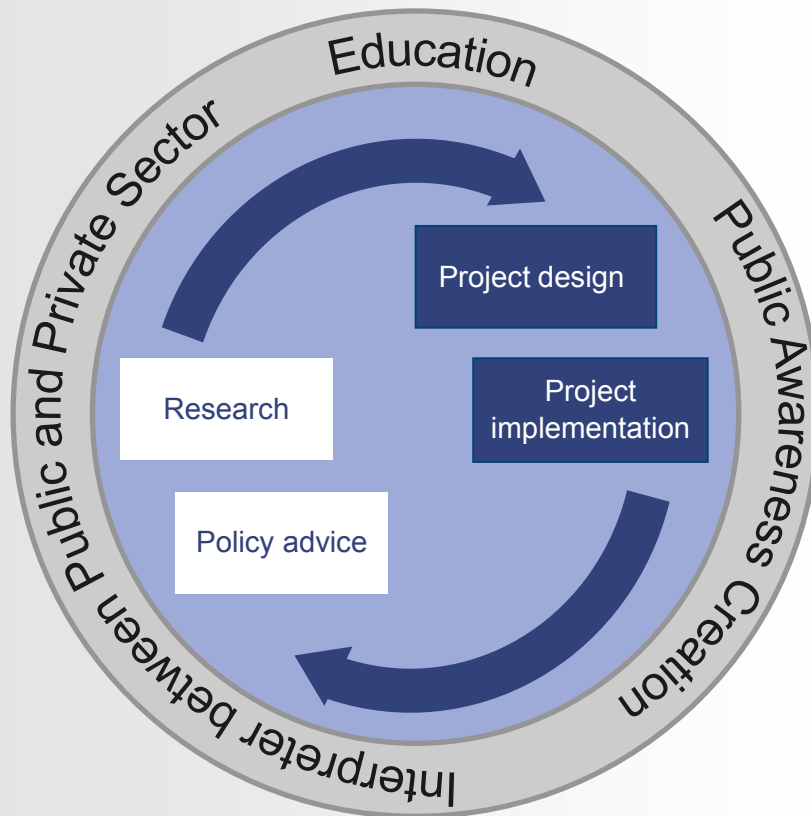
Economic and Financial Viability in RE Projects

Regional Meeting on Sustainable
Energy for African Least Developed
Countries

Dar es Salaam, 6th December 2016
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The Centre's Approach

The Centre combines research with project implementation to foster a dialogue between the private and public sector



A strategic collaboration between the United Nations Environment Programme and Frankfurt School, the Centre is supported by the German Federal Ministry for the Environment.

Acting as UNEP's main knowledge hub for sustainable energy and climate finance, the Centre carries out research with an orientation towards practical application:

- Implementing findings and instruments in the field and thereby functioning as think and do tank
- Crowding in new investors, in particular from the private sector
- Structuring and combining of innovative financing instruments

Project Preparation: Business Plan Development

The “ideal financing process”

**The
ideal
world...**

- Lenders are approached with a stable business plan
- Equity is committed
- Risks are allocated to the party best able to manage them
- PPA is signed (or at least in the final phase of negotiation) and the project has all required permits
- Other key documents available for review: Connection Agreement, Engineering, Procurement and Construction Contract, Operation and Maintenance Agreement and the Government Support and Consent Agreement
- Equity is not fully committed and the financing structure still highly indicative
- Permitting process is ongoing and the project initiator cannot provide a draft PPA
- The role of the lender is often a broader and more active one involving some „coaching“ of the initiator
- Also, commercial lenders are often involved at an earlier stage in the process

**...VS
reality in
less
mature
markets!**

- Risks are allocated in an inefficient manner

Project Preparation: Business Plan Development

Varying objectives of RE project stakeholders (non-exhaustive)

Lender

- Appropriate risk/return profile
- Balance sheet protection
- ALM guidelines
- Business creation/portfolio diversification

Equity Investor

- Equity IRR
- Appropriate risk/return profile
- Long-term involvement

Utility/Regulator:

- Decreasing average generation cost
- Diversification of technologies and energy mix
- Closing the demand-supply gap (if any)
- Macroeconomic viability of the project

Developer

Insuring a viable business case by creating a win-win situation for all stakeholders

Definition of a Viable Business Case

Financial vs economic viability of RE

Economic viability

Does the project make sense from a societal /macroeconomic perspective?

- Average generation costs over the next +/- 20yrs?
- Contribution to ,ideal' energy mix?
- Additional generation capacity required?
- Diversification of technologies
- Hidden subsidies and externalities taken into account?

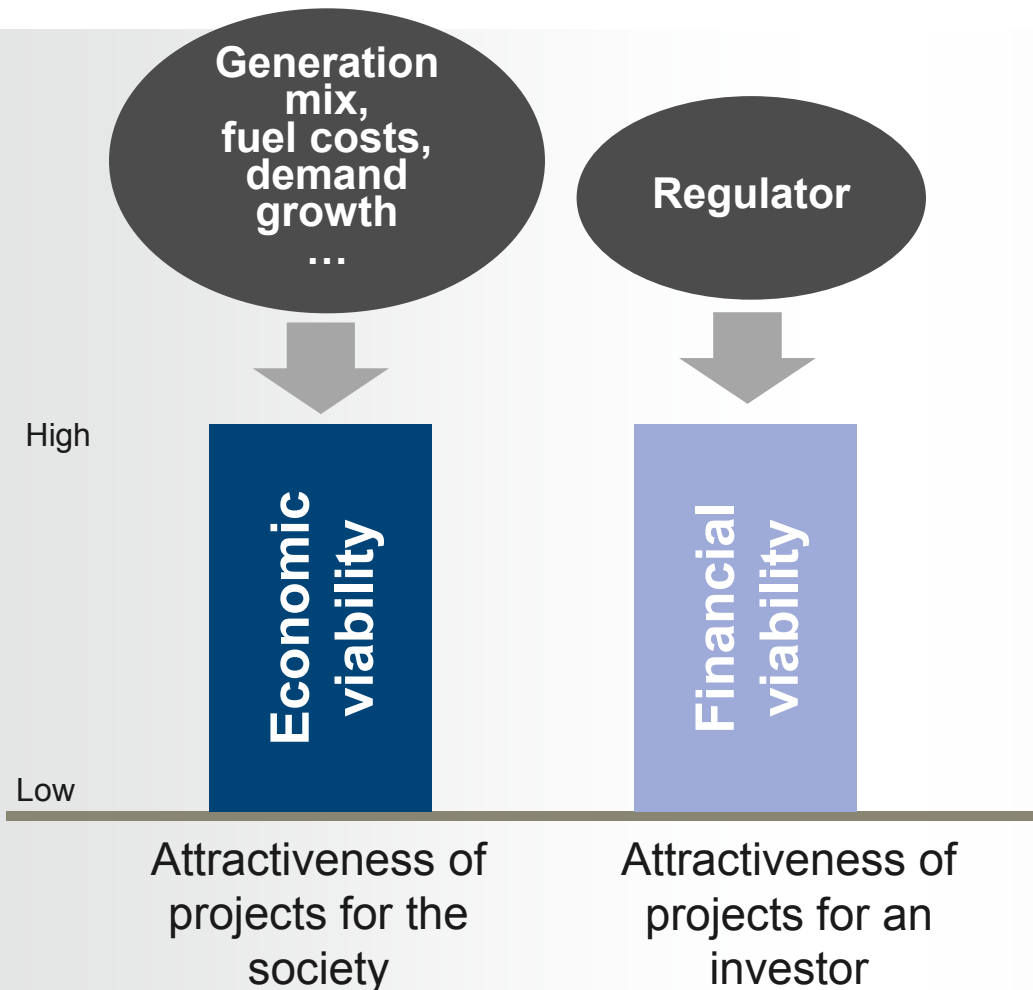
Financial viability

Does the project offer an attractive investment opportunity for a private sector investor (project perspective only)?

- Based on power purchase agreement (PPA) terms
- Ability to service debt
- Ability to pay dividends (EIRR)
- Payback periods
- Considers risk profile of investment

Financial vs Economic Viability of RE

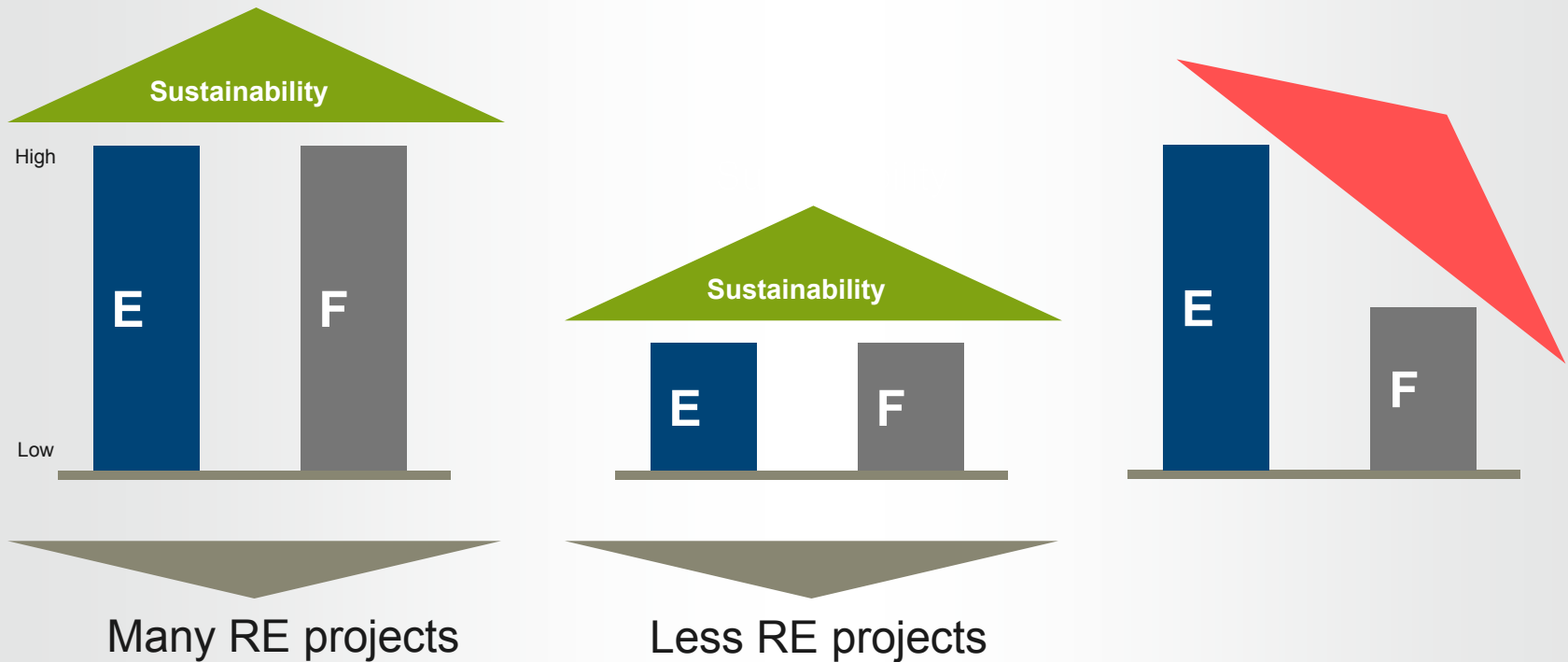
Balancing private and public sector needs



- Economic and financial viability can differ
- Economic viability driven by external factors
- Financial viability for RE should be driven by regulatory framework

Economic & Financial Viability of RE

Don't tip the scales

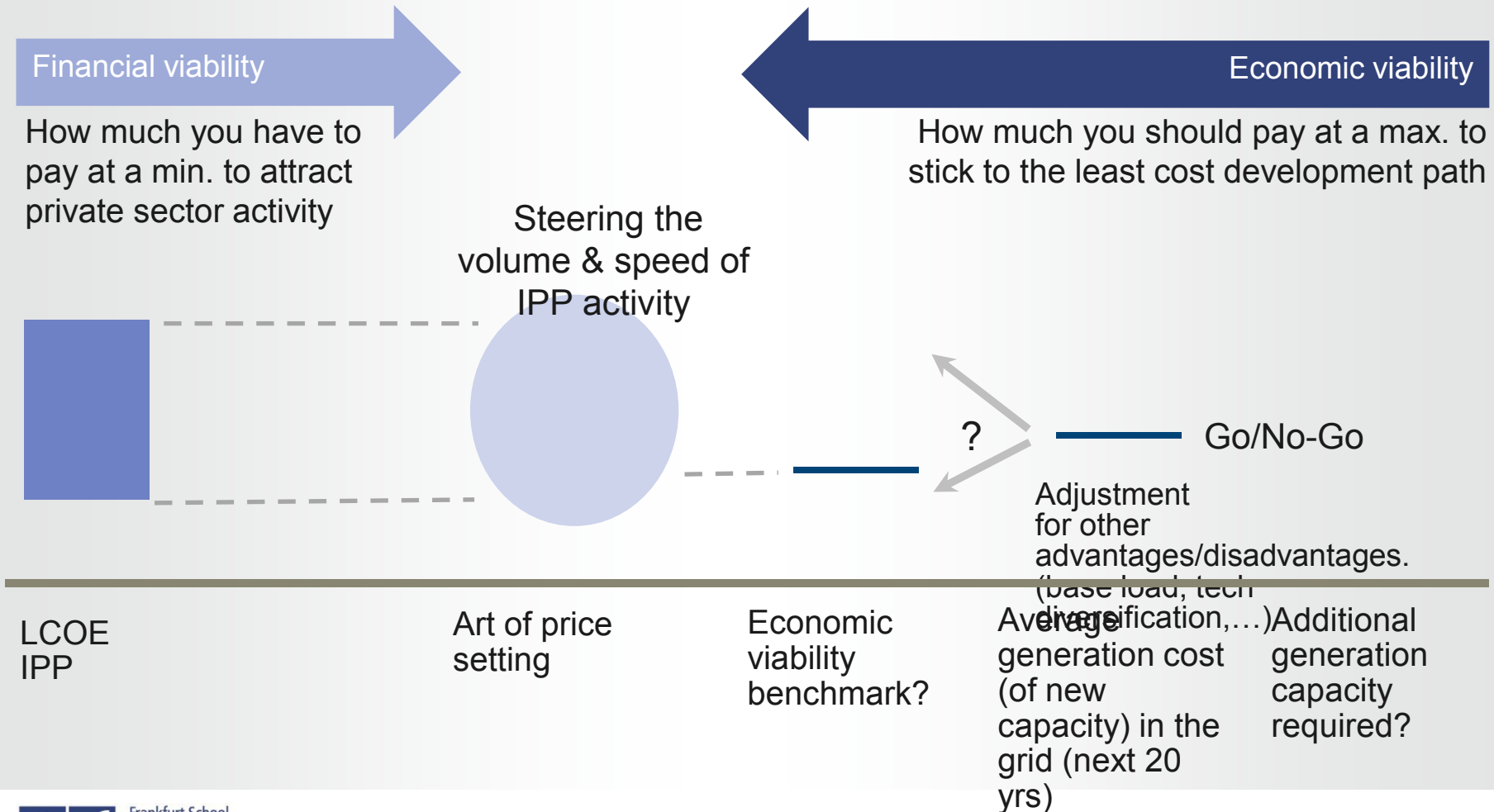


Least cost development energy sector strategy

Inefficiency

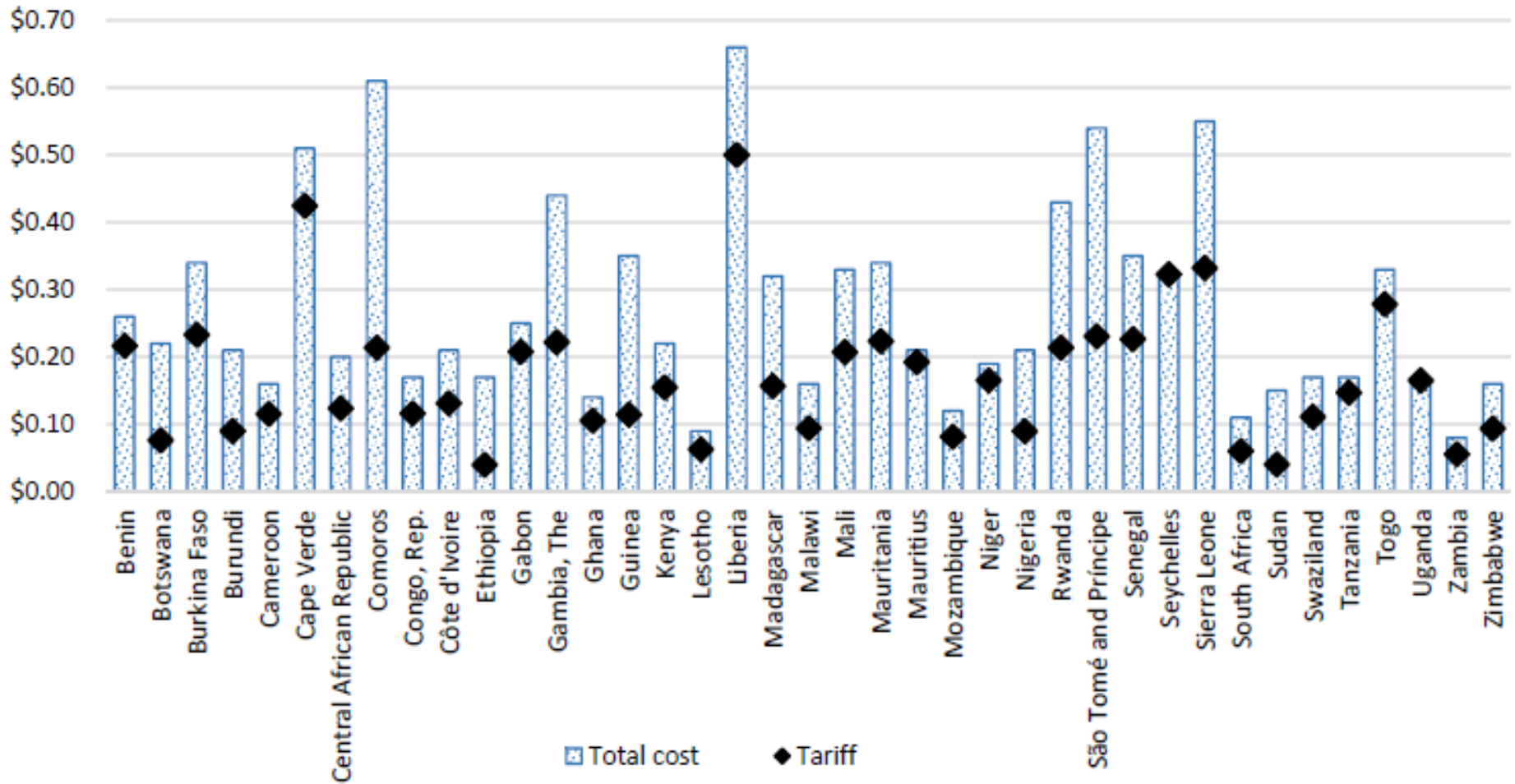
Economic & Financial Viability of RE

Finding the sweet spot for all – price setting



Utilities and their quest to remain in control

Africa's historical struggles – total cost and tariff revenues



Source: World Bank staff calculations based on utility data.



Key Takeaways

- Efficiency in the energy sector is reached if financial viability reflects economic viability
- Regulation is key to create a level playing field and align economic and financial viability
- Regulator to monitor economic viability and define financial viability
- From the start of project development, responsible developers should take the necessity of balancing both economic and financial viability into consideration

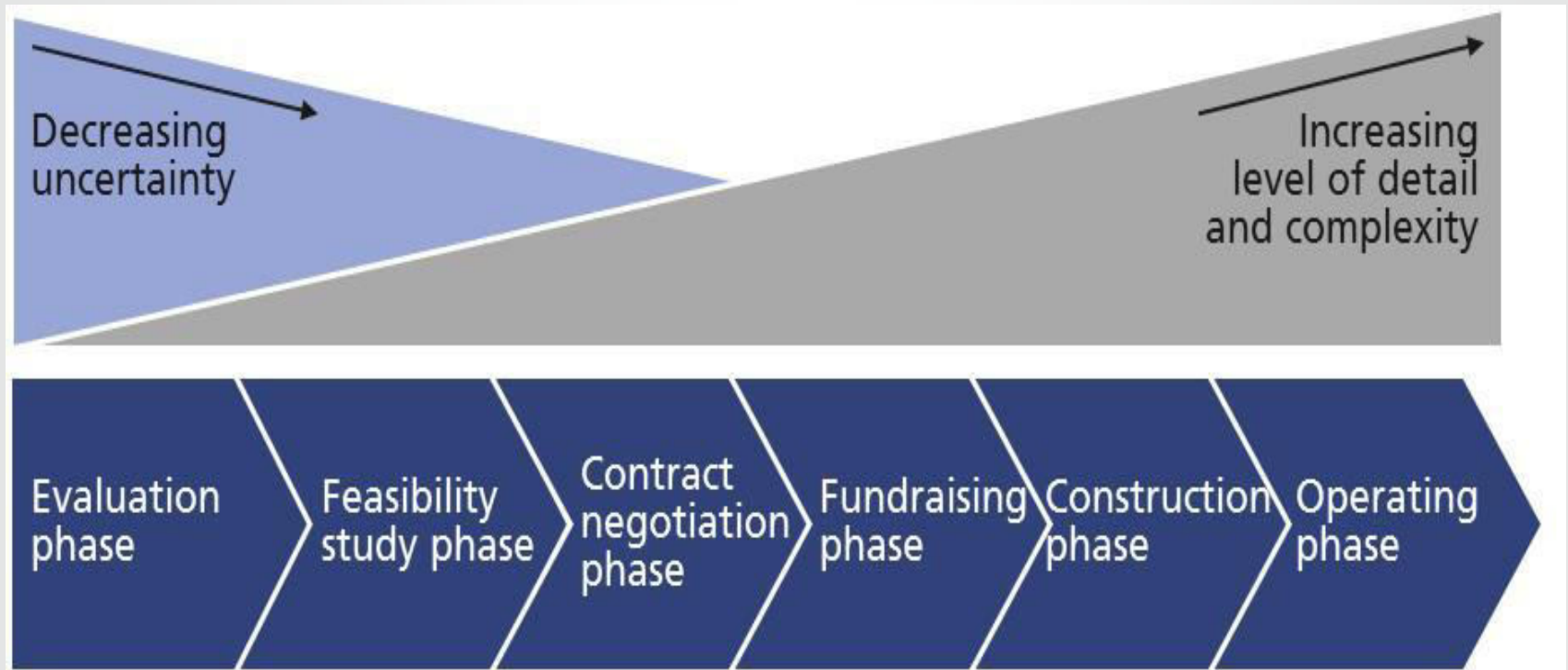


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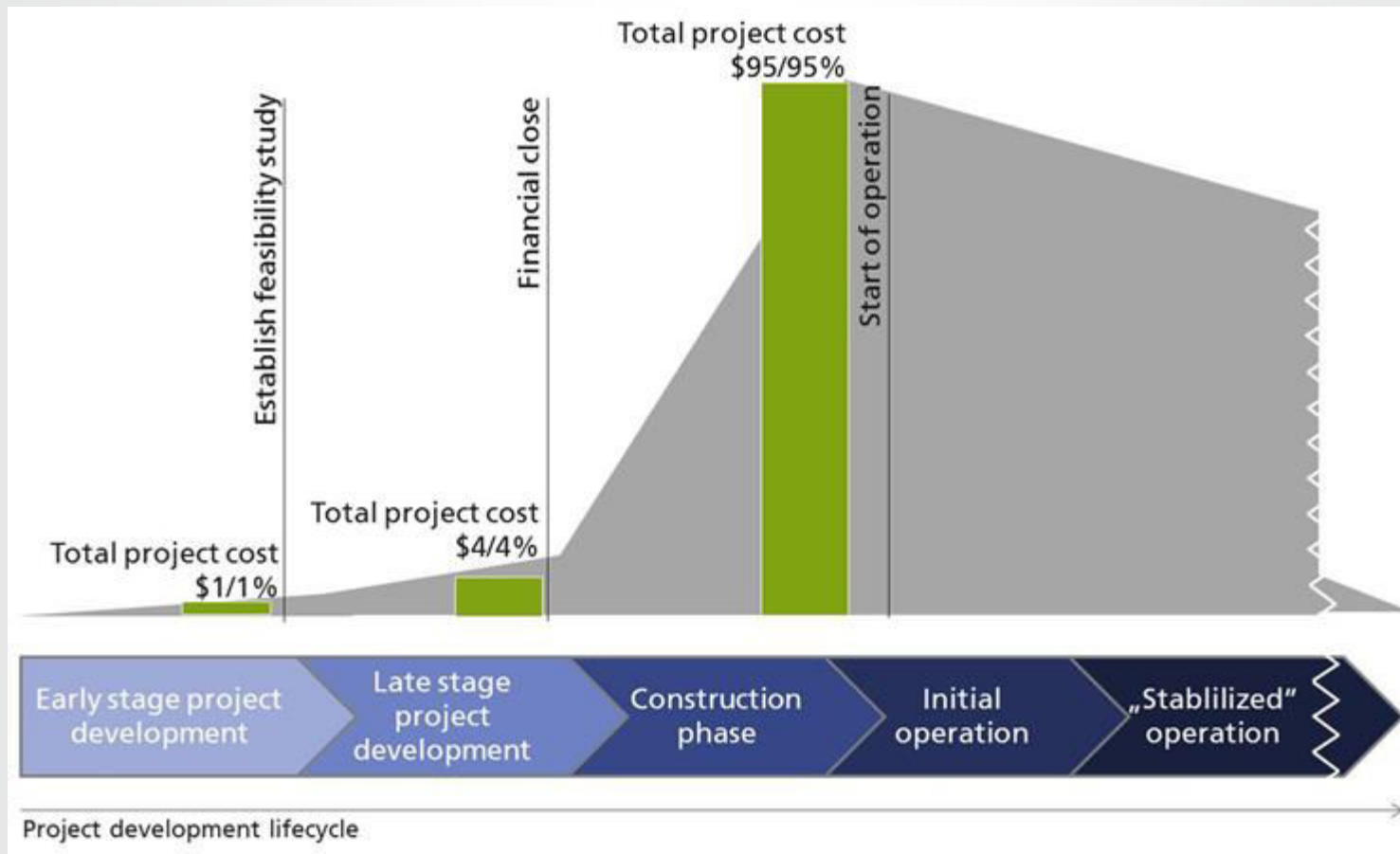
Back-up



Business Plan Preparation Stages

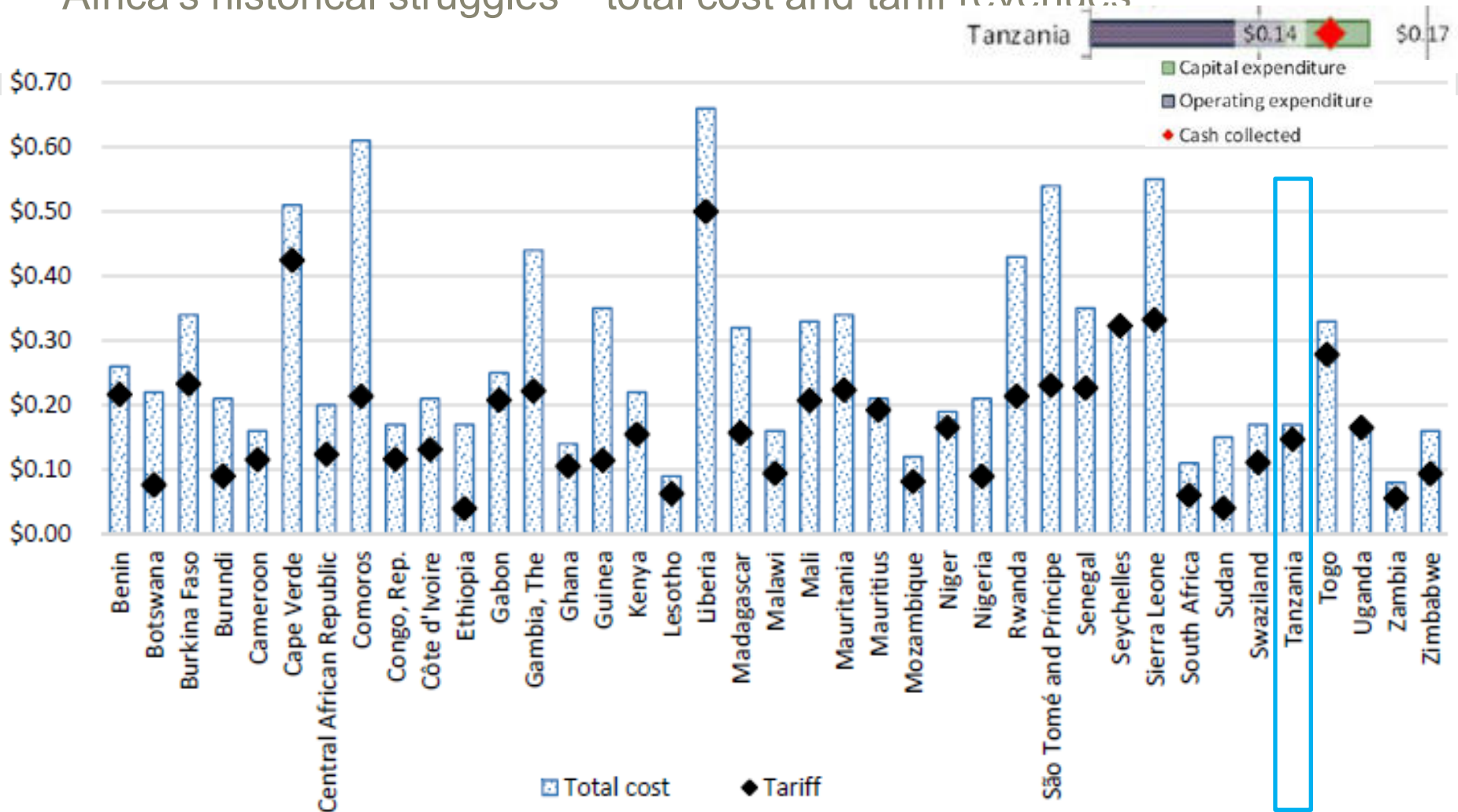


Business Plan Preparation Stages



Utilities and their quest to remain in control

Africa's historical struggles – total cost and tariff revenues

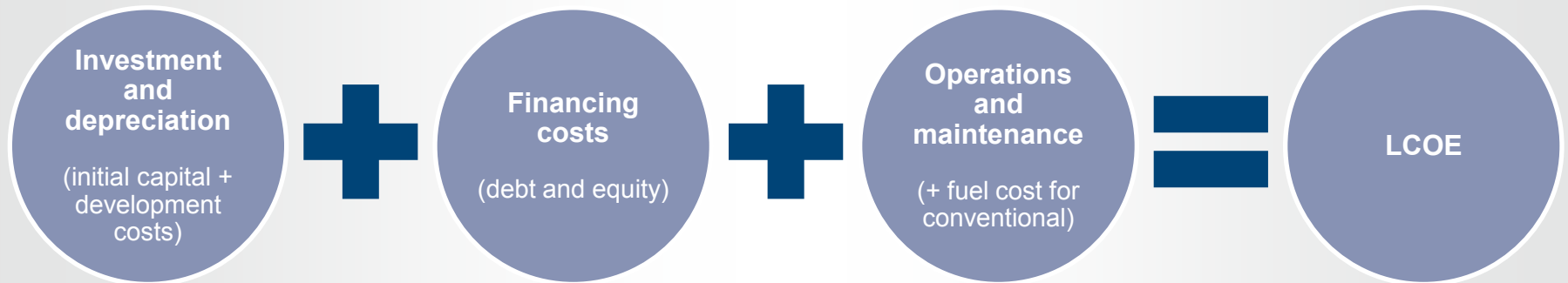


Source: World Bank staff calculations based on utility data.

Business Plan Preparation

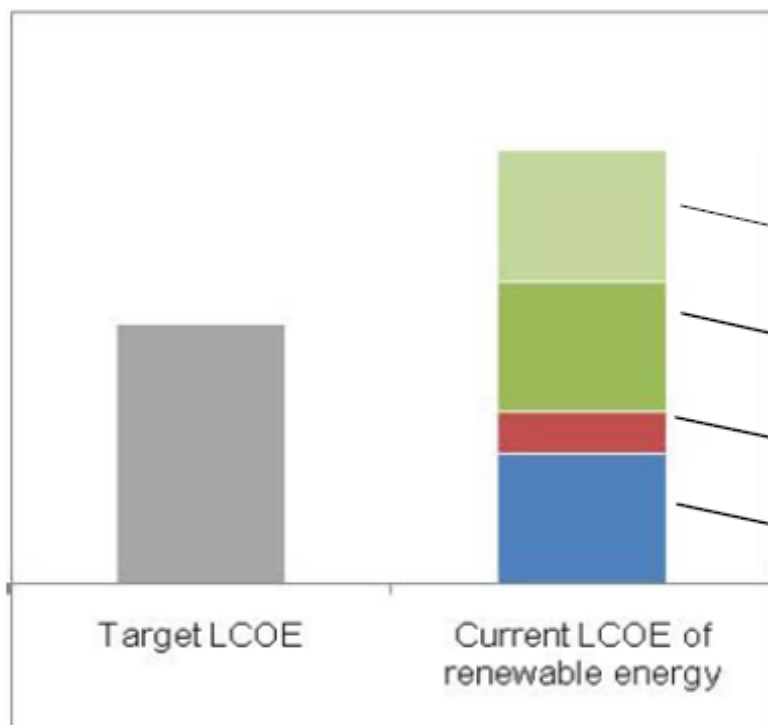
Concept

- Calculating the levelised cost of energy (LCOE) can provide a useful basis for comparing the generation costs of conventional energy sources and those of renewable energy
- Economic assessment that includes all the costs over a plant's lifetime:



- NPV calculation performed and solved in such a way that the project's NPV is zero for the value of the LCOE chosen. This means that the LCOE is the minimum price at which energy must be sold for an energy project to break even
- Downside: Calculation based on the assumption that the timing and flexibility of electricity generation is irrelevant

LEVELISED COST OF ELECTRICITY – COMPONENTS AND DRIVERS



	Drivers
Financing costs – equity	<ul style="list-style-type: none"> Equity IRR expectations (risk reward profile) Equity ratio
Financing costs – debt	<ul style="list-style-type: none"> Loan terms (risk profile) Debt ratio
Operating costs	<ul style="list-style-type: none"> Learning curve and scale effects Technology track record
Capex/ depreciation	<ul style="list-style-type: none"> Learning curve Scale effects