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PRIMER ON THE IMPACT AND TREATMENT OF GRANTS, DONOR ASSISTANCE, AND CONCESSIONAL FINANCING

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List of Abbreviations

AfDB	African Development Bank
AMI	Advanced Metering Infrastructure
ARRA	American Recovery and Reinvestment Act
CapEx	Capital Expenditure
CARCEP	Caribbean Clean Energy Program
CC	Rate of Return (revenue requirement formula)
CDC	Commonwealth Development Corporation
CIF	Climate Investment Funds
CPLTD	Current Portion of Long-Term Debt
CPUC	California Public Utilities Commission
DA	Distribution Automation
DFI	Development Finance Institution
DisCo	Distribution Company
DOE	Department of Energy
DLC	Direct Load Control
DPSP II	Dedicated Private Sector Program
EBRD	European Bank on Reconstruction and Development
EEIF	Electricity Efficiency Improvement Fund
EPRA	Electricity and Petroleum Regulatory Authority
EPSR	Electric Power Sector Reform Act
ERC	Energy Regulatory Commission
FERC	Federal Energy Regulatory Commission
FiT	Feed-in Tariff
GDC	Geothermal Development Company
GDP	Gross Domestic Product
GenCo	Generation Company
GHG	Greenhouse Gas
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IDB	Inter-American Development Bank
IHD	In-Home Displays
LCPDP	Least Cost Development Power Development Plan
LDC	Least Developed Countries
IMF	International Monetary Fund
IPP	Independent Power Producers

JPS	Jamaica Public Services Company, Limited
KPLC	Kenya Power and Lighting Company
LNG	Liquefied Natural Gas
MDB	Multilateral Development Bank
MIGA	Multilateral Investment Guarantee Agency
MoE	Ministry of Energy (Kenya)
MW	Megawatt
MYTO	Multi-year Tariff Order
NARUC	National Association of Regulatory Utility Commissioners
NCCAP	National Climate Change Action Plan
NEP	National Energy Policy (Jamaica)
NEPP	National electric Power Policy (Nigeria)
NERC	Nigeria Electricity Regulatory Commission
NGO	Non-Governmental Organization
PCT	Programmable Communicating Thermostats
ODA	Official Development Assistance
OUR	Office of Utilities Regulation
Opex	Operating Expenditure
PHCN	Power Holding Company of Nigeria
PPA	Power Purchase Agreement
PSEF	Private Sector Energy Fund
PSRO	Power Sector Recovery Operation
PSRP	Power Sector Recovery Program
PURPA	Public Utility Regulatory Policies Act
RB	Rate Base
REA	Rural Electrification Authority
RoR	Rate of Return
RR	Revenue Requirement
SBF	System Benefit Fund
SGIG	Smart Grid Investment Grant
SREP	Scaling-up Renewable Energy Program
TCN	Transmission Company of Nigeria
USAID	United States Agency for International Development
WACC	Weighted Average Cost of Capital

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This primer was developed by the National Association of Regulatory Utility Commissioners (NARUC) with the generous support of the United States Agency for International Development (USAID). This primer is one in a series focusing on specific elements of cost-based ratemaking and will be incorporated into a larger comprehensive guide on tariff settings – The Cost-Reflective Tariff Toolkit.

The Analysis Team would like to thank regulators from the Jamaica Office of Utilities Regulation (OUR), the Nigeria Electricity Regulatory Commission (NERC), and the Uganda Electricity and Petroleum Regulatory Authority (EPRA) for taking the time to discuss the treatment of concessional finance in their respective energy markets and providing invaluable insight for this primer.

About the Author

Cadmus combines over 20 years of experience developing robust and impactful energy policies, regulations, programs, and projects to support thriving energy markets in over 50 countries worldwide. Founded in 1983 and headquartered outside of Boston, Massachusetts, USA, Cadmus is an international, multi-disciplinary consultancy committed to helping its clients address complex challenges by applying innovative solutions that create social and economic value now and for future generations. Cadmus' 600 professionals serve public, private, and non-profit clients globally.

Cadmus' energy practice brings together an interdisciplinary team of experts in law, policy, engineering, economics, finance, stakeholder engagement, and communications. The Cadmus team works in synergy to support governments, utilities, and communities to design and deliver high-impact, locally tailored energy sector solutions. Cadmus is a trusted advisor to energy regulators, utilities, and policymakers in emerging markets worldwide, serving as an on-call technical assistance expert for several global and regional energy programs.

Introduction

Concessional financing is an increasingly common tool to finance energy sector development in emerging economies. These donor-based financial products typically contain terms that are more favorable than what is otherwise available on the market and can help utilities to maintain financial viability as they adapt to rising electricity demand and increased use of Independent Power Producers (IPPs). Though there are different instruments of concessional financing that each seek to address different underlying challenges related to a project, when structured properly, concessional financing can facilitate increased investment and development of the energy sector in emerging markets.

Due to the large role that concessional financing can play in supporting electricity infrastructure in emerging economies and the impact of these instruments on cost-based ratemaking, NARUC, with support from USAID, has developed a *Primer on the Impact and Treatment of Grants, Donor Assistance, and Concessional Financing*.

The Primer is designed as a resource to increase knowledge and equip decision makers with an understanding of the importance and impact of donor-financed assets on the tariff setting process in emerging economies. The Primer also provides key criteria that regulators can use to determine their best individual solution when choosing concessional finance products and offers examples of how utility regulators in countries with emerging markets have treated donor-financed assets in tariff setting.

This primer is one of several primers for policymakers, regulators, and utilities on specific elements of cost-based ratemaking and complements NARUC's other primers on cost-based rate design processes. Together, the primers will comprise a toolkit to increase knowledge and equip decision makers with an understanding of the primary drivers and economic impact of electricity tariffs to inform better policy making and support the progression towards cost-based rates and increased private sector investment.

This Primer is divided into five key sections.

- Section 1: Provides an overview of concessional financing, including definitions and key issues
- Section 2: Explores the effect of concessional financing on rate design
- Section 3: Identifies key criteria that regulators can use to determine a "best fit" solution when selecting concessional finance products
- Section 4: Provides examples from five countries with emerging economies and how they have treated donor-financed assets in tariff setting
- Section 5: Compares and analyzes the case studies to draw out key takeaways

This primer forms part of the Cost-Reflective Tariff Toolkit that NARUC has developed to support electricity regulators in emerging markets, including the following:

1. Promoting Transparency and Public Participation in Energy Regulation: A Communications Primer for Utility Regulators
2. Regulatory Accounting: A Primer for Utility Regulators
3. A Cost of Capital and Capital Markets Primer for Utility Regulators
4. Primer on Rate Design for Cost-Reflective Tariffs
5. Primer on Primary Drivers of Electricity Tariffs for Utility Regulators
6. Depreciation Expense: A Primer for Utility Regulators

1 Concessional Financing – What is it?

Concessional financing is an umbrella term referring to financial products—including loans, grants, guarantees, and equity investments—that are provided on more favorable terms than what is typically available in the market. It is typically provided by donor organizations such as USAID or by Development Finance Institutions (DFIs) such as the World Bank or the International Monetary Fund (IMF). In the context of energy utilities, concessional financing is commonly used to invest in physical projects and facilities, finance public infrastructure, provide budget support for the implementation of policies, facilitate the introduction of new technologies, or purchase new equipment.

This type of financing still plays an important role to ensure that energy providers are financially viable as non-creditworthy state-owned utilities struggle to keep pace with rising electricity demand. This is leading emerging markets to turn increasingly towards the Independent Power Producer (IPP) model. IPPs are investor-owned entities that produce electricity to sell to utilities and occasionally, to end users themselves.

However, there is an inherent tension between the goals of private investors, who seek a high return to compensate for the risks associated with investments in developing countries, and host country governments, who seek to satisfy public demands at the lowest feasible cost. When properly structured, concessional and grant financing can alleviate this tension while facilitating increased investment and development of the energy sector in emerging markets.

1.1 Concessional Finance Instruments

There are several different instruments of concessional financing, each of which seeks to address different underlying challenges related to access, cost, risk, or the cash-flow profile of a project. These instruments include the following:

- **Concessional loans**, or soft loans, are loans extended using public money on terms that are substantially more generous than those available in the market. These loans may charge no interest or have an interest rate below market rates for the given risk profile and typically offer longer repayment schedules or grace periods than market loans. In the energy context, DFIs, multilateral development banks (MDBs), and local and/or national governments offer concessional loans to utilities in emerging markets that face barriers restricting their ability to borrow at the market rate.[1] [2] [3] Because the conditions of a loan can be coupled with any politically desired requirements, concessional loans can also be used to incentivize the development of politically desired projects.[4] However, loans may also offer no systematic way to ensure public funds are allocated efficiently and can be highly time-intensive and costly to administer and monitor.[5]
- **Grants** are funds targeted towards a specific investment, provided without the expectation of repayment. Because the subsidization component of a grant is equal to the grant's face

[1] U.S. Agency for International Development. *What sources of grants or concessional financing exist to help with mini-grids in developing countries?* (2018). Accessed 21 March, 2021 from https://www.usaid.gov/energy/mini-grids/financing/grants.

[2] The European Bank for Reconstruction and Development (EBRD), *Private Sector Roundtable: DFI Guidance for Using Investment Concessional Finance in Private Sector Operations* (EBRD, 2013).

[3] Karol Kempa; Ulf Moslener, "Climate Policy with the Chequebook: An Economic Analysis of Climate Investment Support," *Economics of Energy and Environmental Policy*, 6, 1 (2017): 111-129.

[4] Ibid.

[5] Paul Bodnar, Caroline Ott, Rupert Edwards, Stephan Hoch, Emily F. McGlynn, & Gernot Wagner, "Underwriting 1.5°C: competitive approaches to financing accelerated climate change mitigation," *Climate Policy*, 18, 3 (2018).

value, grants can be considered the most transparent form of concessional financing.[6] In terms of their impact on electricity tariffs, grants can be dispersed as either capital expenditures or operational subsidies, including interest rate subsidies or periodical payments for intended results that have been achieved.[7] Similar to loans, grants also have associated operational costs and offer no guarantee that funds are allocated efficiently.

- **Risk mitigation mechanisms**, including partial credit guarantees, political risk insurance, risk-sharing facilities, structured debt funds, and securitizations, can be concessional in that they are not priced commensurate for the risk that they cover. For example, a private lender who receives a guarantee for certain risks or parts of a loan from a credible public institution confronts less risk and may consequently ask for a lower premium on the interest rate or provide a higher loan amount.[8] In practice, risk mitigation mechanisms are typically used to lower the cost of financing a specific project, and can also catalyze commercial funders to support activities deemed "risky" by commercial lenders, particularly when risk cover from commercial insurers may not be available or affordable.[9] These mechanisms can address underlying portfolio risks and are typically used when liquidity is not an issue or to indirectly address the cost of local currency funding.

- **Equity** is considered concessional when "the provider of concessional equity accepts a lower return for the risk or buys the equity at a less favorable price than commercial investors."[10] However, equity is only concessional to the extent that the investor requires a lower-risk adjusted Rate of Return (RoR), facilitating the sponsor to invest in riskier projects than commercial investors would normally consider for the same expected return. Equity may also leverage additional debt finance by improving a project's equity-to-debt ratio due to its lower rank of security for the investor.[11]

- **Capital contributions**, or the financing of a company by the business owner or shareholders from their personal assets, can be considered concessional in that equity for the company increases, but the profit of the company does not.

1.1.1 Blended Concessional Finance

Any of the above concessional finance instruments may also be "blended." **Blended concessional finance** is "the use of relatively small amounts of concessional donor funds to mitigate specific investment risks and help rebalance the risk-reward profiles of pioneering investments that are unable to proceed on strictly commercial terms."[12] Blending is an increasingly common practice among DFIs, as most of these institutions are not allowed to offer funding from their own resources below their cost of funds. When DFIs seek to leverage their funds to incentivize private investment in high-risk environments (often the areas in need of greatest assistance), they may face substantial obstacles to incentivizing private investment.

[6] EBRD, *Private Sector Roundtable* (2013).

[7] Ibid.

[8] Kempa & Moslener, "Climate Policy with the Chequebook" (2017).

[9] EBRD, *Private Sector Roundtable* (2013).

[10] Ibid.

[11] Ibid.

[12] International Finance Corporation (IFC), "Blended Concessional Finance," IFC, accessed 25 March, 2021 from https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/bf.

In these situations, blended concessional finance can support pioneering private sector projects and address market failures.[13] [14] When successfully implemented, blended concessional finance investments develop self-sustaining projects by creating conditions for other investors to invest in these areas. Additionally, blended finance is perceived as a more transparent way of providing a grant element and, because it reduces administrative costs and coordination issues, may be more efficient to implement than parallel financing—where a project is divided into different components or contracts and separately financed by the DFI and its partners.[15]

1.2 Key Issues in Concessional Finance

When carefully structured, concessional finance products can incentivize private sector investments, deliver social benefits that may not have occurred with commercial financing alone, and improve the financial discipline of emerging markets.[16] However, when poorly structured, concessional activities can distort the market and undermine its sustainability or delay the introduction of desired policy reforms.[17] It is necessary to understand these risks and assess the potential costs and benefits of a project in order to effectively apply mitigation measures to the design of concessional finance products.

1.2.1 Impacts on Private Investment

While concessional support to the private sector is intended to help close gaps in finance, knowledge, and standards, when improperly structured, it has the potential to distort the market and undermine its intended impact. Concessional investments in commercial activities could crowd out private investment. Additionally, aid increases public investment, which can signal a negative effect on private investment in developing countries.

Concessional finance may also encourage private firms to engage in rent seeking behavior—seeking to win low-productivity aid contracts at high gain to the firms rather than pursuing investments that could result in sustained private ventures.[18] These challenges have led numerous DFIs and bilateral agencies to restrict the provision of concessional finance to the private sector except in specific cases.[19] Other common challenges faced in efforts to catalyze private sector investment through donor financing include:[20]

- Donors that direct projects to countries where the risks to the private sector are overwhelming and not likely to be overcome through project finance alone.
- Private investors that interpret donor investments as a signal that a given country or sector offers few profitable opportunities.
- Recipient governments that delay policy reforms needed to attract private investment when they face lower financial pressure from donors unlikely to withdraw from profitable projects.

[13] Arthur Karlin & Kruskaia Sierra-Escalante, *Blended Concessional Finance: The Rise of Returnable Capital Contributions* (International Finance Corporation, 2019).

[14] IFC, "Blended Concessional Finance."

[15] EBRD, *Private Sector Roundtable,* (2013).

[16] Ibid.

[17] Ibid.

[18] Mark T. Buntaine & William A. Pizer, "Encouraging clean energy investment in developing countries: what role for aid?", *Climate Policy* (2014).

[19] Ibid.

[20] Buntaine & Pizer, "Encouraging clean energy investment in developing countries," (2014), pp. 546

When addressing a clear barrier, however, concessional finance can instead facilitate the growth of the private sector and commercial investment and support a sustainable solution to the targeted barrier. Concessional finance should thus be reserved for facilities and locations not being serviced by the private sector and where investors would not proceed with activities without the benefits of concessional finance.[21, 22]

For example, when introducing new energy-efficient technologies and/or business practices where these activities would not normally be undertaken due to relative novelty, high perceived risk, high initial cost of an undemonstrated market behavior, a currently adverse or untested regulatory framework, or untested technology, concessional finance can remove or lessen the associated risk, thus altering market incentives and increasing the likelihood of future entrants reaching commercial sustainability.[23]

Additionally, aid that supports infrastructure can increase the productivity of private capital and increase private investment (from both foreign and domestic funders). Finally, beyond addressing market or institutional failures, concessional finance can bridge the gap between the private and social returns of a project by addressing "public good" externalities—reducing emissions, conserving and enhancing biological diversity, deploying innovative technology, and affordable provision of infrastructure services. As benefits such as these cannot be immediately monetized by investors, the private financial rate of return for these investments is lower than the true economic rate of return for society.[24]

For the outcome of concessionality to be sustainable, these funds should be time-bound and attempt to address that problem rather than create a lasting dependence on concessional funds.[25] This implies an expectation that concessional finance will wane as commercial investment increases or that similar private sector projects in the future will be viable without concessionality. In many cases, this will require parallel interventions targeting underlying structural change in markets, regulatory or institutional challenges, policy dialogue or advisory services, or other activities designed to increase the likelihood of permanent market transformation.[26] When donor financing catalyzes private investment, a faster accumulation of private investment in countries where donors are early investors should be observed relative to countries where donors are not early investors.[27]

1.2.2 Impacts on Financial Management

Concessional financing can either improve or disincentivize financial management within a targeted utility depending on the instrument used and how it is applied. Loans, for example, are generally considered to increase financial discipline, fiscal revenues, and investment rates as well as promote economic efficiency due to their clear repayment horizons. However, particularly in the context of the world's economically poorest countries, loans may gradually accumulate to create an unsustainable debt burden that countries are unable to repay. Similarly, grants are often perceived to disincentivize budgetary discipline, leading to lower tax receipts and domestic revenues.[28] Nonetheless, performance

[21] EBRD, *Private Sector Roundtable,* (2013).

[22] Buntaine & Pizer, "Encouraging clean energy investment in developing countries," (2014).

[23] EBRD, *Private Sector Roundtable,* (2013).

[24] Ibid.

[25] Ibid.

[26] Ibid.

[27] Buntaine & Pizer, "Encouraging clean energy investment in developing countries," (2014).

[28] Tim Cholibois, "Electrifying the 'eighth continent: exploring the role of climate finance and its impact on energy justice and equality in Madagascar's planned energy transition," *Climatic Change,* 161 (2020), 345-364.

grants can also be leveraged to incentivize reforms in a host country and incentivize project sponsors to meet development goals or improve financial management by tying the provision and volume of grants to politically justified parameters.[29, 30] To improve financial discipline, disbursements under grant-based payments should be linked to significant achieved and verified results or milestones.

1.2.3 Poor Regulatory Environment

Concessional finance interventions, particularly for private-sector energy projects, should be accompanied by clear and contextually appropriate policies regarding foreign investment, energy tariffs, power grid regulations, permitting, and subsidies.[31] Policy reforms—including changes in tax policy, permitting, and legal protections for investment and intellectual property; establishing national incentive schemes for clean energy or energy efficiency; or modernizing rules on foreign investment and contractor participation—can reduce risks and increase the profitability of private investment tied to concessional finance. [32]

In order to bridge the gap between private and social returns and achieve commercial sustainability, parallel interventions such as policy dialogue and technical assistance designed to address the root causes of market failure(s) may be required. If addressing these failures is not feasible in the short term or if these interventions are insufficient, concessional finance may be required to continue bridging this gap.[33] As a result, concessional financing would not achieve commercial sustainability.

1.2.4 Impacts on Vulnerable Populations

Because of the desire inherent in any concessional project to be profitable, private sector projects are under pressure to ensure a high rate of return on their investments. This may cause donors to prioritize investments in countries where the policy environment is already favorable and where there are limited operational constraints, signaling an existing active private sector.[34] Market-based mechanisms can yield challenges to the least developed countries (LDCs) attempting to create projects that are attractive to finance providers, as new funding mechanisms (particularly in the area of climate finance) are generally designed for large, emerging economies where scale can swiftly be achieved.[35]

For similar reasons, projects in LDCs can exclude the poorest parts of the population, as only the richest and most populous areas are likely to be electrified in the short-term. This may discourage in-country actors with a clear social vision from applying for funding.[36] Nonetheless, concessional finance may also address concerns over energy distribution by improving economic opportunities and their equality for specific vulnerable groups,[37] as well as reducing the electricity rates paid by households and freeing up capital for other purposes.

[29] Kempa & Moslener, "Climate Policy with the Chequebook," (2017).

[30] Karlin & Sierra-Escalante, *Blended Concessional Finance,* (2019).

[31] Buntaine & Pizer, "Encouraging clean energy investment in developing countries" (2014).

[32] Ibid.

[33] EBRD, *Private Sector Roundtable*, (2013).

[34] Ibid.

[35] Tim Cholibois, "Electrifying the 'eighth continent: exploring the role of climate finance and its impact on energy justice and equality in Madagascar's planned energy transition," *Climatic Change,* 161 (2020), 349.

[36] Ibid.

[37] Ibid.

2 Effect on Concessional Finance on Rate Base and Tariff

When calculating the rate base, capital assets financed through concessional loans or grants can be considered "free" (e.g., gifts, capital contributions), no-cost capital, or low-cost (below market-rate capital).

2.1 Concessional Finance in the Revenue Requirement Formula

The standard revenue requirement formula is:

RR = Opex + (RB x CC) + D + T, where:

- RR = Revenue Requirement
- Opex = Operating Expenditure
- RB = Rate Base
- CC = Rate of Return
- D = Depreciation
- T = Taxes

The **Rate Base** represents the capital that utilities have invested to provide services to customers, or the value of assets on which investors are entitled to earn a return. Generally speaking, concessional finance is accounted for under the Rate Base. Typically, grants or donor-funded assets would be deducted from the rate base, which can be beneficial to customers by lowering the cost of electricity and improving utility access to capital. However, if utilities cannot earn a return on these assets, they will not be incentivized to take advantage of these sources of capital.

Regulators in emerging markets are frequently faced with the challenge of accounting for concessional finance, and there is a significant amount of debate with no widely accepted practice for this at present. This primer explores several possible approaches:

- **A Partial Capital Expenditure (CapEx) recovery** for concessionally financed assets enables shareholders to earn a return on a portion of an asset funded with concessional finance. This incentivizes utilities to take advantage of concessional finance to improve or expand generation, transmission, and distribution infrastructure. This would benefit consumers with improved service at lower electricity rates than if the projects were financed entirely through capital markets. It may also allow a portion of the CapEx funded through concessional finance to be included in the rate base.
- **Adjusting costs of capital calculation:** Instead of removing the cost of the asset from the rate base, the return that is allowed on that asset could instead be lowered to account for the impacts of concessional finance. For example, in some cases, concessional finance could include concessional loans with lower interest rates, which should be reflected in the cost of capital calculation
- **Opex recovery of costs associated with obtaining concessional finance:** Obtaining certain forms of finance is an expense on the utility, including costs associated with identifying concessional funding, applying for this funding, etc. Rather than including a grant-funded asset in the rate base, for example, a regulator could allow the utility to recover the costs associated with obtaining that grant in the Opex.

2.2 Examples

2.2.1 Reference – Rate Base without Concessional Finance

In the below example, a distribution company (DisCo) in Nigeria wishes to invest ₦ 500,000 to expand the distribution network to a rural community and does not use concessional finance. This example

assumes a rate of return of 10 percent, an asset life of five years (no salvage value), and 1,000 customers.

	Y1	Y2	Y3	Y4	Y5	
Asset Value (₦'000)	500	400	300	200	100	**Totals**
Annual Depreciation (₦'000)	100	100	100	100	100	500
Return on Investment (₦'000)	50	40	30	20	10	150
Tariff Cost /customer (₦)	150	140	130	120	110	650

2.2.2 Reference - Rate Base with Concessional Finance

In another example, instead of being financed by the DisCo, a local government authority offers to finance 95 percent of the capital needed to expand the distribution network. This would make the upfront CapEx just ₦ 25,000. In this case, the cost of the concessionally financed asset is excluded from the rate base.

	Y1	Y2	Y3	Y4	Y5	
Asset Value (₦'000)	25	20	15	10	5	**Totals**
Annual Depreciation (₦'000)	5	5	5	5	5	25
Return on Investment (₦'000)	2.5	2	1.5	1	0.5	7.5
Tariff Cost /customer (₦)	7.5	7	6.5	6	5.5	32.5

Taken from the above tables, the effect of concessional finance, when excluded from the rate base, has the following impacts on the rate base and tariff as summarized in the table below:

Totals	Without Grant Finance	With Grant Finance
Initial Outlay	₦ 500,000	₦ 25,000
Net Depreciation	₦ 500,000	₦ 25,000
Gross Return on Investment	₦ 150,000	₦ 7,500
Tariff Cost /customer	₦ 650.00 / customer	₦ 32.5 / customer

2.2.3 Partial CapEx Recovery

These results change when Partial CapEx Recovery is introduced. In this example, a local government authority offers to finance 95 percent of the capital needed by the DisCo, leaving the up-front CapEx by the DisCo at just ₦ 25,000. However, the regulator allows an additional 30 percent of the costs of the asset to be included in the Rate Base (partial cost recovery); in this case, an additional ₦150,000. In other words, the regulator allows 35 percent of the cost of the asset in Rate Base (30 percent of the total asset in addition to the five percent already covered by the utility).

	Y1	Y2	Y3	Y4	Y5	
Asset Value (₦'000)	175	140	105	70	35	**Totals**
Annual Depreciation (₦'000)	5	5	5	5	5	25
Return on Investment (₦'000)	17.5	14	10.5	7	3.5	52.5
Tariff Cost /customer (₦)	22.5	19	15.5	12	8.5	77.5

2.2.4 Adjusting Costs of Capital Calculation

In another example, the local government authority again offers to finance 95 percent of the capital needed to expand the distribution network. But instead of removing the concessionally financed portion from the CapEx, the regulator permits the utility to recover the full value of the asset but reduces the rate of return by 30 percent (to seven percent) to account for the impacts of concessional finance.

	Y1	Y2	Y3	Y4	Y5	
Asset Value (₦'000)	500	400	300	200	100	**Totals**
Annual Depreciation (₦'000)	100	100	100	100	100	500
Return on Investment (₦'000)	35	28	21	14	7	105
Tariff Cost /customer (₦)	135	128	121	114	107	605

2.2.5 Opex Recovery of Costs Associated with Obtaining Concessional Finance

In this example, the local government authority again offers to finance 95 percent of the capital needed to expand the distribution network. Here, the cost of the concessionally financed asset is excluded from the rate base, but the utility is permitted to recover the cost of obtaining the concessional financing in the Opex. This example assumes that the cost of obtaining the concessional financing is 10% of the original asset value.

	Y1	Y2	Y3	Y4	Y5	
Asset Value (₦'000)	25	20	15	10	5	**Totals**
Opex (₦'000)	50	50	50	50	50	**250**
Annual Depreciation (₦'000)	5	5	5	5	5	25
Return on Investment (₦'000)	2.5	2	1.5	1	0.5	7.5
Tariff Cost /customer (₦)	57.5	57	56.5	56	55.5	282.5

2.2.6 Comparison of Examples

The table below summarizes the findings from these examples, demonstrating the impacts of concessional finance on return on investment and tariff costs in various situations. The examples provided include cases without concessional or grant finance, cases with concessional or grant finance that is excluded from the rate base, cases with concessional finance and a regulatory allowance that can be included in the rate base, cases with concessional finance excluded from the rate base and a

reduced rate of return, and cases with concessional finance included in the rate base and a regulatory allowance for Opex recovery.

	Without Grant Finance	With Grant Finance	With Grant Finance + Regulatory Allowance	With Grant Finance + Adjusted CC	With Grant Finance + Opex Recovery
Initial Outlay	₦ 500,000	₦ 25,000	₦ 175,000	₦ 500,000	₦ 25,000
Net Depreciation	₦ 500,000	₦ 25,000	₦ 25,000	₦ 500,000	₦ 25,000
Gross Return on Investment	₦ 150,000	₦ 7,500	₦ 52,500	₦ 105,000	₦ 7,500
Tariff Cost /customer	₦ 650	₦ 32.5	₦ 77.5	₦ 605	₦ 282.5

3 Criteria Regulators Can Use to Determine "Best Fit" Solution

The sections below describe key options and considerations that regulators should consider when planning or implementing a concessional finance intervention in the electricity sector.

3.1 Key Principles to Consider in the Design of Concessional Finance Products

This section considers key principles in the design of concessional finance products that should be considered and, as appropriate, met to ensure the sustainability and success of a given intervention. These principles are largely adapted from the European Bank on Reconstruction and Development's (EBRD) 2013 "Private Sector Roundtable: DFI Guidance for Using Investment Concessional Finance in Private Sector Operations."[38]

3.1.1 Additionality

Simply put, additionality is a determination of the net positive difference that results from an intervention, when compared to the baseline. To achieve additionality, concessional financing should make contributions beyond what is available in the market. However, concessional finance can undermine additionality if it crowds out the private sector. For example, if a DFI offers equivalent financial services on concessional terms as commercial financial institutions, it would undermine the additionality of that intervention. To achieve additionality, DFIs should determine whether a reasonable investor would decide to proceed with a given project *absent* the presence of concessional finance.[39] Therefore, concessional finance should be employed only in areas where the private sector is unable to provide adequate support to make a project viable.

3.1.2 Crowding-in

As discussed above, concessional finance should not crowd-out private investment. To the extent possible, it should instead "crowd-in" private investment or incentivize private sector investment to catalyze market development. When the economy is in recession or operating below full capacity, concessional spending can increase the economic growth rate and "create a positive multiplier effect," which leads to greater private sector investment.[40]

To achieve this outcome, concessional finance interventions should be structured to provide the missing financial element preventing private sector projects from being commercially financeable. They should also create a "demonstration effect" of commercial responsibility. To maximize the leverage of private funding, a concessional finance intervention should follow the "minimum concessionality" principle—they should not be greater in value than what is necessary to induce the intended investment.[41]

3.1.3 Commercial Sustainability

Commercial sustainability means balancing an intervention's economic, environmental, and social impacts through effective management while maximizing organizational profitability. DFIs should ensure that any operations supported with concessional funds are designed to contribute to the commercial sustainability of the intervention and its associated impact, both during and after their involvement. Concessional finance interventions should therefore avoid creating permanent dependency on long-term subsidies and seek to discourage private beneficiaries from rent-seeking

[38] EBRD, *Private Sector Roundtable,* (2013).

[39] Ibid.

[40] Tejvan Pettinger, "Crowding in effect," Economics Help, 15 August 2013, https://www.economicshelp.org/blog/glossary/crowding-in-effect/.

[41] EBRD, *Private Sector Roundtable,* (2013).

behavior. When concessional finance is time-bound or comes with credible expectations that it will be phased out over time, it can achieve sustainability, encourage commercial replication of supported operations, and manage subsidy expectations among the private sector. When possible, programs should include sunset clauses that set a reasonable expectation for the end of concessional support prior to its lapsing. Additionally, concessional support should come with the expectation that future investments in similar projects will gradually phase out subsidies until they are no longer required.[42]

3.1.4 Reinforcing Markets

Concessional support should be structured in such a manner that it addresses market failures, minimizes the risk of market disruption or undue distortion, and avoids crowding out private finance. This support should never substitute for or delay more sustainable commercial or policy interventions. It should instead supplement and be consistent with measures seeking to address the root causes of market failures and barriers, as well as help to develop a market responsive to structures that incentivize the provision of desired goods or services.

To do this, concessional finance should align the incentives of a project's participants with market-compatible behavior, including encouraging the maximum delivery of social and economic outcomes (e.g., emission reduction, energy saved) and compensating for the incremental cost of going above and beyond standard practice in the sector.

3.1.5 Promoting High Standards

A failed or unnecessary project that benefited from concessional support is likely to raise questions about whether this support was appropriate, to the reputational risk of the donor. Thus, whenever possible, DFI support to private sector operations should encourage adherence to high standards of conduct in their clients, particularly in the areas of corporate governance, the environment, social inclusion, transparency, and integrity.[43]

An unnecessary or poorly designed project that receives concessional funds will likely undermine the development of functioning markets or the private sector. Additionally, concessional finance products to support private sector operations should be tied to targeted technical assistance or policy dialogue with the host country government to address policy and institutional barriers that could prevent the commercial viability of projects.[44]

3.2 Blended Concessional Finance Models

There are two primary models by which DFIs provide blended concessional finance: the grant/long-term contribution model and the returnable-capital model. Depending on the conditions of their agreements and the regulations in the country providing concessional finance, these models can differ substantially in terms of impacts on government budgets. From a donor perspective, these models differ with regard to cash flows, budgets, credits for official development assistance (ODA), and the instruments available to the ultimate public sector clients. Additionally, the model employed can affect which concessional finance instruments are used, the level of concessionality, and the risk appetite available for use in private sector projects. [45]

[42] EBRD, *Private Sector Roundtable,* (2013).

[43] Ibid.

[44] Ibid.

[45] EBRD, *Private Sector Roundtable,* (2013).

3.2.1 Grant/long-term contribution model

Until recent years, the majority of concessional funds provided by DFIs in blended concessional finance projects resulted in grants or long-term contributions to facilities that invested these funds in private sector projects on concessional terms alongside DFI or commercial finance.[46] Under this model, reflows (e.g., principal, interest, fees, and dividends) from clients would flow into the facility rather than back to the donor (as in the returnable-capital model). Depending on the facility's agreement with its financiers, it may use these reflows for advisory services or additional private investment, though there may be provisions in place requiring the eventual return of remaining capital to the original donor.[47]

Grants and funding advisory services tend to fit better under this model and should be considered depending on the long-term development challenges being confronted. Grants or long-term contributions can be viewed as on-budget expenses, and thus can be accounted for as part of ODA.[48] Advisory services provide important support to creating markets in high-risk countries, whereas performance grants play an important role in aligning incentives among various stakeholders and in achieving the development outcome that would not otherwise be obtained.[49]

The grant/long-term contribution model is the more flexible of the two primary blended concessional finance models. Depending on the terms of the agreement with donors, funds provided to a facility can be used for various types of debt, equity, guarantees, and grants, in addition to technical assistance and/or capacity building.[50]

3.2.2 Returnable-capital model

Under the returnable-capital model, there is an explicitly stated agreement that reflows—such as interest, fees, dividends, and repayment of principal—are regularly returned to the entity that provides concessional funds. This allows the donor to reinvest reflows towards other programs or priorities.[51] Contributions for the returnable-capital model can be viewed as investments and are thus generally treated as off-budget expenses. This can provide a strong incentive to offer funds to facilities as returnable capital rather than as grants or long-term contributions.

Because the returnable-capital model requires a regular reflow of funds, the provision of grants and performance-based incentives to clients and the funding of advisory services is generally not possible under this model, as these expenses would diminish the potential for reflows. In many cases, establishing returnable capital models requires new collaborations between providers of concessional finance and the institutions with the capacity and experience to effectively deploy non-grant instruments to the private sector.[52] In these cases, concessional finance providers should determine the extent to which management can be undertaken in-house versus delegating investment decisions to a partner.

For private sector clients, the returnable-capital model can lead to changes in private sector clients' allowable risk profile, pricing flexibility, and corresponding levels of concessionality. Under the returnable capital model, providers of finance are directly affected by the performance of their private

[46] Karlin & Sierra-Escalante, *Blended Concessional Finance,* (2019).

[47] Ibid.

[48] Ibid.

[49] Ibid.

[50] Ibid.

[51] Ibid.

[52] Karlin & Sierra-Escalante, *Blended Concessional Finance,* (2019).

sector investments and the price charged for taking those risks. This could lead certain donors (i.e., those looking for a basic level of return) to put greater restrictions on the degree of concessionality or the risk levels of the projects being undertaken.[53] It can also leverage private capital to offer new opportunities to increase development outcomes through the private sector. [54]

The overall result for government budgets can be that substantially more resources are available to the private sector through the returnable capital model. Additionally, shifting private sector programs from grants to returnable capital takes the private finance off budget, opening up the availability of grant resources for purposes that are not suitable for the returnable-capital model, such as investments in human capital.[55]

3.2.3 When to use each model?

Given the differential uses of these two models, they should be aligned to the development outcome that one attempts to solve through a given intervention. In some cases, both models can be employed: returnable capital can be used to make needed investments, whereas facility grant agreements can be made for investment grants, performance incentives, or advisory services.

Alternatively, a facility could be structured as partially returnable capital, allowing for a percentage to be allocated through some of the grant-based instruments. Because grants (both investment- and performance-based) and advisory services are generally unavailable under the returnable capital model, providers of concessional finance should consider what impact these instruments could have on their development goals.

[53] Ibid.

[54] Ibid.

[55] Ibid.

4 Case Studies

To provide real-world examples of how concessional and grant finance impacts electricity markets throughout the developing world, the Cadmus team analyzed the impact of these instruments in five countries, considering the differing contexts and manners in which these instruments are employed. A comparative analysis of these case studies is provided in Section 5.

4.1 Jamaica

4.1.1 Electricity Sector Context

Jamaica Public Services Company, Limited (JPS) is a vertically integrated power company with exclusive rights to transmit, distribute, and supply electricity in Jamaica. For the most part, generation is provided by plants owned by JPS itself, but the rest is provided by IPPs through power purchase agreements (PPAs) for capacity or energy. The public supply of electricity is governed by the Office of Utilities Regulation (OUR).

- **National Energy Policy (NEP) (2009-2030)** is the first comprehensive long-term plan to govern the energy sector, the goal of the NEP is to develop a modern, efficient, diverse, and environmentally sustainable energy sector. Additionally, the NEP seeks to provide affordable and accessible energy supplies with long-term energy security and supported by informed public behavior on energy issues and an appropriate policy, regulatory, and institutional framework.[56]
- **The 2015 Electricity Act** updated the regulatory environment to create market conditions and facilitate the growth of private sector involvement in the sector, promote transparency in the identification and allocation of costs and revenues within and between participants in the electricity sector; clarify the perspective roles and responsibilities of the stakeholders in the electricity sector; achieve efficient, effective, sustainable, and orderly development and operation of electricity supply infrastructure (supported by investment), and promote green measure such as energy efficiency and renewable energy.[57]
- **The 2016 Electricity License** led to numerous changes in the framework governing the electricity sector, most notably: 1) the introduction of a revenue cap approach to replace the price cap mechanism, and 2) the substitution of a forward-looking approach[58] to the calculation of the tariff for the historic test-year approach.[59]

While electrification has reached 98% in Jamaica, the sector continues to suffer from various challenges, including high energy costs and electricity tariffs due in large part to a high dependence on

[56] The Ministry of Science, Technology, Energy, and Mining. "Jamaica's National Energy Policy 2009-2030," (Government of Jamaica, 2009).

[57] The Ministry of Science, Technology, Energy and Mining, "An Act to Repeal the Electricity Lighting Act, Electricity (Frequency Conversion) Act and Electricity Development Act; to consolidate and modernize the laws relating to the generation, transmission, distribution, dispatch and supply of electricity; and for connected matters", (Government of Jamaica, 2015), https://www.mset.gov.jm/wp-content/uploads/2019/07/Electricity-Bill-2015.pdf.

[58] A forward-looking approach requires that JPS' rates be based on forecasted expenditure, revenue, and demand (among other things). This allows for a better matching of JPS' activities with its revenues but may lead to challenges if there are wide variances in the projections.

[59] Office of Utilities Regulation (OUR), "Final Criteria: Jamaica Public Service Company Limited 2019-2024 Rate Review Process," (Office of Utilities Regulation, 2019).

imported fossil fuels and high system losses in transmission and distribution. [60, 61] The country has taken steps to advance energy efficiency on the island through tax exemptions for energy efficiency equipment, required energy efficiency labeling to influence purchase decisions for household appliances (e.g., refrigerators and freezers), and utility-led energy audit programs.[62]

It has also promoted several policies to benefit renewable energy generation, such as a tax exemption for imports of renewable generating equipment.[63] Future and planned efforts to improve the electricity sector include reducing electricity costs and lowering prices, lowering the sector's vulnerability to oil price fluctuations by reducing reliance on imported petroleum products, strengthening the regulatory framework governing the sector through the provision of clear policy directions, regulations, and incentives; reducing greenhouse gas emissions; and mobilizing private sector financing for energy infrastructure.[64]

4.1.2 Concessional Finance and Its Treatment in Jamaica's Energy Sector

Jamaica has very limited experience with concessional finance in the development of energy infrastructure, and most finance is lent on commercial terms in order to avoid market distortion. Instead, IFI support is generally used to support improvements to the policy, legislative, and regulatory environment and to provide incentives for energy efficiency and low-emission growth in the sector. Additionally, concessional support is leveraged to commercial investment from the private sector. Therefore, concessional finance in Jamaica's energy rate most closely aligns with Example 2.2.1 "Reference – Rate Base without Concessional Finance," as concessional finance has historically not been applied to electricity utilities.

Therefore, concessional finance would be treated equivalently to other loans in the design of Jamaica's electricity rates. In Jamaica, a revenue requirement is developed for the utility using a historical "test year." The test year is used to create the rates going forward that last until the next rate review in five years.

Any financing received between reviews will not be incorporated into the rates until the next review cycle. In the case of grant-financed assets, the grant would be treated differently depending on the nature of the asset. In the case of a cash grant, the utility would take on the amount of the grant as a transfer of funds and would not need to report it to OUR. In the case of a grant-financed tangible asset, the amount of the grant would be spread over the useful life of the asset.

While concessional financing does not receive special consideration in Jamaica's electricity tariff, it nonetheless plays a pivotal role in Jamaica's energy transition, supporting opening of the regulatory framework to create space for diversified products, energy types, and services; increasing public sector use of energy efficiency and distributed electricity generation; and unlocking private finance. For example:

- The Rockport Independent Power Project is one of the first cases of financing from MDBs successfully mobilizing private sector financing for a limited resource project. The World Bank and Inter-American Development Bank (IDB) together provided a $40.5 million, 17-year loan to the Jamaican government's Private Sector Energy Fund (PSEF) to finance a 60-

[60] Christiaan Gischler and Nils Janson, "Perspectives for Distributed Generation with Renewable Energy in Latin America and the Caribbean," (Americas Competitiveness Forum V, Santo Domingo, 2011).

[61] Energy Transition Initiative, "Energy Snapshot: Jamaica," (National Renewable Energy Laboratory, 2016).

[62] Ibid.

[63] Ibid.

[64] World Bank, "Improving Energy Efficiency and Security in Jamaica," World Bank Group, 26 April 2019, https://www.worldbank.org/en/results/2019/04/26/improving-energy-efficiency-and-security-in-jamaica.

megawatt low-speed diesel power station. The Rockport project sought private investment to develop the project through an international competitive bidding process. Investors were required to finance at least 30 percent of project costs in the form of an equity investment, and the remaining 70 percent could be funded through the PSEF. The government of Jamaica agreed to accept a lower percentage of project equity in cases where the prospective developer offered an incentive to mobilize non-Fund debt (thus requiring no direct government guarantees).[65]

The project's first five years saw debt financing from private commercial sources, mainly consisting of interim debt guaranteed by letters of credit from established banks. [66] Financing from IFIs was thus used to support start-up costs from the early years of implementation, but the concessionality of this finance abated after the project reached viability through commercial sources. A principal feature of the financing for the Rockport project was the use of low-cost Caribbean Basin Projects Financing Authority 946 bond financing from profits of U.S. subsidiaries operating in Puerto Rico. This bond financing provided the equivalent of 84.7 percent of the total funding for the Rockport project and was used to cover base capital costs. The other principal source of funding, the Commonwealth Development Corporation (CDC) provided flexibility to the package through another $19.8 million in base and standby credits. [67]

- In 2017, the USAID Caribbean Clean Energy Program (CARCEP) began implementing a grants program (the Clean Energy Innovation Fund) in the region worth a total of $1.5 million with grants ranging from $25,000 to $150,000. The Fund did not work directly with utilities, and instead encouraged local communities, non-governmental organizations (NGOs), and stakeholders to participate in and contribute towards CARCEP's goals through grants and technical assistance that enabled these entities to overcome certain barriers to project development, accelerate project financing for clean energy, and bolster energy efficiency initiatives. It was structured in such a way as to require individual recipients to acquire and leverage outside funding, allowing them to unlock a far larger resource pool.[68]

- Under a $15 million loan for the Jamaica Energy Security and Efficiency Enhancement Project, the World Bank aided the government of Jamaica in the implementation of the National Energy Policy. While this project did not provide funds directly to the utility, it provided technical advisory services to OUR to accelerate the development of privately financed generation by preparing electricity investments that the project would not finance and facilitating interaction with private developers. In this way, 623 MW of new capacity was added by 2019. Additionally, the components of the project strengthened the regulatory framework by providing clear policy directions, regulations, and incentives to mobilize private investment, promote renewable energies, and increase energy efficiency; building institutional capacity to formulate, plan, and implement energy policies and monitor and evaluate the outcomes; and mobilizing private sector financing for energy infrastructure where public finance is insufficient to directly provide substantial financial resources.[69]

[65] Basil Sutherland, "Financing Jamaica's Rockport Independent Power Project: A Review of Experience for Future Projects," (The World Bank, RMC Discussion Paper Series (121), 1998).

[66] Ibid.

[67] Ibid.

[68] Caribbean Clean Energy Program (CARCEP), "Caribbean Clean Energy Program: Final Performance Report", (United States Agency for International Development, 2018).

[69] Energy and Extractives Global Practice, "Loan 8007" (2018).

4.2 Nigeria

4.2.1 Electricity Sector Context

Nigeria's electricity sector is governed by the Nigeria Electricity Regulatory Commission (NERC) and faces numerous challenges, including low electrification rates, frequent power interruptions, and a high dependence on personal generators (which are far more expensive and less reliable than grid-based power).[70] To combat these challenges, the government of Nigeria underwent one of the world's most ambitious privatization initiatives beginning in 1999 through which the sector was unbundled into separate models for transmission, generation, and distribution.

The federal government retains ownership of transmission assets under the Transmission Company of Nigeria (TCN), managed by a Canadian company. The generation and distribution sectors are fully privatized. There is a total of six successor generation companies (GenCos) managing 23 grid-connecting generating plants with a combined installed capacity of 11,165.4 MW. The 11 distribution companies (discos) in Nigeria serve 5 customer groups: residential, commercial, industrial, special, and street lighting. By 2013, the reform process was complete, but many criticized the inability of GenCos and discos to deliver sufficient electricity for all and the difficulty that IPPs face in becoming commercially viable. [71]

The key acts governing the Nigerian electricity sector and the reform process include:

- **The National Electric Power Policy (NEPP)**, passed in 2001, began the liberalization of Nigeria's vertically integrated, state-owned monopoly, the National Electric Power Authority (NEPA). NEPP was an initial step towards transferring ownership and management of electricity sector infrastructure to the private sector in hopes of creating a competitive electricity market.
- **The Electric Power Sector Reform (EPSR) Act** established the Nigerian Electricity Regulatory Commission (NERC) and transformed NEPA into the Power Holding Company of Nigeria (PHCN), a transitional corporation that housed the six generation companies, 11 distribution companies, and one transmission company that were to become fully privatized. Privatization of PHCN occurred between 2010 and 2014.
- **The Multi-Year Tariff Order (MYTO)**, first introduced in 2008, is a tariff vehicle that seeks to transition the market towards a more cost-reflective tariff structure that sets wholesale and retail prices in the Nigerian electricity market. The retail tariff accounts for all the costs in the value chain. It is based on principles and assumptions such as cost recovery (financial viability), signals for investment, certainty and stability, efficiency of the network, allocation of risk, simplicity and cost effectiveness, incentives for improving performance, transparency, flexibility, and social and political objectives.[72] The methodology behind the MYTO combines positive attributes of regulating the rate of return and price cap and is different by region and by type of electricity customer. Three main modules are factored into the calculation of the MYTO: allowed return on investment, allowed return on capital, and

[70] Nigerian Finder, "Nigerian Power Sector: A General Overview," accessed 26 April 2021 from https://nigerianfinder.com/nigerian-power-sector-a-general-overview/.

[71] The Nigerian Energy Support Programme (NESP), "The Nigerian Energy Sector -an Overview with a Special Emphasis on Renewable Energy, Energy Efficiency, and Rural Electrification," (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Abuja, 2014).

[72] KPMG, "A Guide to the Nigerian Power Sector," (KPMG Nigeria, 2016).

efficient operating costs and overheads. Each disco has tariffs reflecting its unique position in terms of cost, location, and customer profile.[73]

At the onset of privatization, numerous challenges (e.g., power theft, inadequate supply, collection losses, inadequate revenue, limited capacity) led to significant losses and poor returns on investment, requiring a strategic approach to combat them and stimulate growth in the sector. Immediate investments focused mostly on improving the sector's infrastructure: reducing power theft and collection losses, increasing distribution capacity, rehabilitating stranded units to increase generation capacity, investing in gas meters, and improving transmission capacity.[74] Over the long-term, NERC focused on attracting more private sector investments and establishing institutions with the capacity to help realize the gains of privatization.

4.2.2 Concessional Finance and its Treatment in the Nigerian Energy Sector

Since the full implementation of the privatization process, NERC has centrally set electricity prices in line with the MYTO. Prices to be paid to the DisCos differ by region, whereas prices paid to GenCos depend on the feedstock used (e.g., gas, hydropower, wind, solar, biomass). There are two approaches to treating concessional financing in Nigeria depending upon the circumstances. The first is a hybrid of a rate of return and an incentive-based approach wherein the utility's mutual capital expenditure is provided in a tariff for five years ahead of time. Nigerian DisCos are expected to raise appropriate financing to meet this tariff.

In this situation, the weighted average cost of capital (WACC) is considered a reasonable return, so utilities could pass on savings from any additional capital raised to rate payers. In the Nigerian context, the WACC is the return on rate base that the regulator allows the utility to earn. The WACC is determined by calculating the average cost of each source of capital and then weighing each source by the percentage of the total capital from that source.[75] Thus, concessionally financed assets acquired by the DisCo are included in the rate and the utility may earn a return on these assets.[76]

The rates that would result from this example most closely reflect those in Section 2.2.1 "Rate Base without Concessional Finance," because the utility recovers the full revenue requirement regardless of whether they were able to secure cost savings. Because the WACC would be lower in the case of concessional financed assets, this would lead to a lower revenue requirement and, consequently, lower rates for customers.

However, when the regulator (NERC) is involved in securing concessional finance, such as in generating markets or in PPAs not procured through a competitive bidding process (e.g., utility provides project finance details to the regulator to approve), a regulatory approved rate of return is tied to the financed asset. This figure reflects the actual rate of return, so the utility does not keep the benefit. In other words, when the regulator or government is involved in securing financing, utilities do not receive a return on these assets.

Similarly, for donor agency-provided loans, a return will not be provided because the sovereign country is the responsible entity, except in circumstances where a subsidiary loan agreement exists

[73] Ibid.

[74] KPMG, "A Guide to the Nigerian Power Sector" (2016).

[75] NERC, "Consultation Paper for the 2011 Major Review of the Multi Year Tariff Order (MYTO), (Government of Nigeria, 2011).

[76] Representative from Nigeria Electricity Regulatory Commission (NERC), Interview by Cadmus Team, 2 June 2021.

between the sovereign and the utility wherein the utility is required to make the payment.[77] This reflects Section 2.2.2 "Rate Base with Concessional Finance" in Section 2.

Throughout the privatization process, public sector players have continued to be active in the market, particularly in those states that acquired or are interested in acquiring shares in distribution companies or independent power plants. NGOs and international donor organizations generally provide support to policymaking, environmental energy efficiency, and renewable energy projects. DFIs, however, are involved in various cases in debt financing for larger generating company projects and in upgrades and expansion of the transmission sector.[78]

These public sector institutions tend to be the primary driver of rural electrification, energy efficiency, and renewable energy initiatives, initiatives based on development needs and that are strictly non-commercial.[79] Despite these efforts, the private sector still fails to invest sufficiently in the sector and generation lags far behind demand. Examples of concessional finance to the electricity sector in Nigeria include:

- The initial acquisition of the generation and distribution assets was largely aided by support from local and international financial institutions. However, repeated revisions to the bid timetable for the takeover of successor companies evidently extended the takeover date, an outcome that investors likely did not foresee when establishing revenue projections and negotiating terms of the loans.[80]

- DFIs such as the World Bank and the African Development Bank (AfDB) assist electricity investors through partial risk guarantees totaling US$670 million in total project volume and offered through the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), and the Multilateral Investment Guarantee Agency (MIGA). Partial risk guarantees from the IDA and IBRD are used to protect private lenders and/or investors against the risk of a government entity not fulfilling its end of a contract. Guarantees from MIGA protect investors and lenders from risks associated with changes in government policies. These instruments are appropriate for the privatization of assets.

- In August 2016, the federal government and the World Bank signed a $237 million guarantee to bring an additional 450 MW to the national grid by 2018 through the Azura-Edo IPP. This project was key for setting the contractual framework for the development of other large-scale IPPs and is expected to drive other projects with the World Bank Guarantee Scheme.[81]

- Beginning in 2020, the World Bank-funded Power Sector Recovery Operation (PSRO) for Nigeria is a $750 million loan that provides results-based financing in support of the implementation of Nigeria's Power Sector Recovery Program (PSRP). The program seeks to improve the reliability of electricity supply, achieve financial and fiscal sustainability, and enhance accountability. The PSRO is expected to increase annual electricity supplied to the distribution grid, enhance power sector financial viability, reduce annual tariff shortfalls, and protect economically vulnerable populations from the impact of tariff adjustments. The World Bank hopes this will enable the government of Nigeria to turn around the power sector,

[77] Representative from Nigeria Electricity Regulatory Commission (NERC), Interview by Cadmus Team, 2 June 2021.

[78] NESP, "The Nigerian Energy Sector" (GIZ, 2014).

[79] Ibid.

[80] Ibid.

[81] Ibid.

redirect large fiscal resources from highly regressive tariff shortfall financing towards critical crisis-responsive and pro-poor expenditures.[82]

4.3 Kenya

4.3.1 Kenya Electricity Sector Context

Kenya's power sector is highly developed relative to other countries in sub-Saharan Africa, with a total installed capacity of 2,819 MW and 75 percent electrification rate (urban access is 100 percent; rural access is 65.7 percent). This high level of development can be attributed to several main factors: Kenya has an active private sector; its utility, Kenya Power and Lighting Company (KPLC), has a long record as a credit-worthy off-taker; and the country is home to many renewable energy sources including geothermal, wind and solar.[83]

In addition, Kenya uses cost reflective tariffs, has been open to IPPs since the 1990s, and has a supportive regulatory and institutional framework.[84] This regulatory environment is a strong driver for the deployment of renewable energy, and is the result of targeted reforms over the past several decades. Key policies and legislation governing the energy sector in Kenya include:

- **The Kenya Vision 2030**, which aims to "transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all of its citizens by 2030 in a clean and secure environment."[85] In addition to growing gross domestic product (GDP), a key component of the 2030 strategy includes equitably expanding access to electricity and safe water, upgrading public transportation, and investing in geothermal, wind and solar energy generation to help stabilize the energy supply from the climate impacts on Kenya's hydro power, which has previously been curtailed due to severe drought.[86]
- **The Least Cost Development Power Development Plan (LCPDP)**, a sub-plan under the Vision 2030, identifies geothermal energy as the least cost generation source, and aims to develop more than 5000 MW of geothermal, 2000 MW wind, and investments of $23 billion in renewable energy generation and $4.5 billion in transmission.[87]
- **National Climate Change Response Strategy (NCCRS)** is a 2010 strategy that recognizes that climate change is a threat to national socio-economic development and integrates considerations and recommended actions for climate mitigation and adaptation into national policies and programs. The **Green Energy Development Programme**, developed in the NCCRS, highlights renewable resources available in Kenya to help reduce greenhouse gas (GHG) emissions and reliance on imported fossil fuels.[88]
- **National Climate Change Action Plan (NCCAP)** was launched in 2013 and addresses options for a "low-carbon climate resilient development pathway as Kenya adapts to climate

[82] Chike Olisah, "World Bank approves $750 million loan to Nigeria for power sector," Nairametrics, 24 June 2020, retrieved from https://nairametrics.com/2020/06/24/world-bank-approves-750-million-loan-to-nigeria-for-power-sector/.

[83] USAID, "Power Africa Fact Sheet: Kenya," 1 Feb. 2021, retrieved from https://www.usaid.gov/powerafrica/kenya.

[84] Climate Investment Funds, "International Meeting of the SREP Sub-Committee: Investment Plan for Kenya," (Washington, D.C., 8 Sept 2011)

[85] Government of Kenya, "Kenya Vision 2030," retrieved from https://vision2030.go.ke/.

[86] Ibid.

[87] World Economic Forum, "Unlocking Financing for Clean Energy in Kenya – Workshop Summary," (World Economic Forum, 15 May 2012).

[88] Government of Kenya, "National Climate Change Response Strategy Executive Brief," (April 2010).

impacts and mitigates growing emissions." Finance, policy, legislation, knowledge management, capacity development, technological requirements, monitoring, and reporting are also addressed in the plan as they pertain to enabling the NCCAP.[89]

- **Sessional Paper No. 4 of 2004 and the Energy Act of 2006.** Through these policies, the Kenyan government demonstrates its commitment to generating electricity from renewable energy sources like geothermal, wind, and solar and aligning with Vision 2030. The broad objective of the Energy Policy is to "ensure adequate, quality, cost effective and affordable supply of energy through use of indigenous energy sources in order to meet development needs, while protecting and conserving the environment."[90] The policy recognizes the role of the energy sector in the success of the socio-economic and environmental strategies that are being pursued by the government, and promotes the use of low-carbon emission energy for electrification when possible, recognizing the role of fossil fuels in climate change and the negative impacts of climate change on Kenya's socio-economic development.[91]

  The Energy Policy also established key elements of the regulatory and institutional framework for regulating electricity. It authorized the single independent Energy Regulatory Commission (ERC) with the authority to regulate all sector players, established the State-owned Geothermal Development company to lead geothermal resource assessments and sale of steam to IPPs and KenGen for electricity generation, privatized KenGen, created a rural electrification authority (REA) to take over rural electrification efforts that were previously performed by the Ministry of Energy (MoE, responsible for overall sector coordination and formulation of policy), and unbundled KPLC into two separate entities – a state owned transmission entity, and a privately owned distribution entity. The policy also promotes privately- or community-owned vertically integrated entities to operate renewable energy facilities or coexist with licensed electricity distributors, and privatized or concessioning isolated power stations to reduce operating costs (and free resources for rural electrification).[92]

- **The Feed-in-Tariff** allows power producers to sell electricity generated from renewable sources (wind, biomass, small hydros, geothermal, biogas and solar) at a pre-determined tariff rate and term period. The FiT was developed in 2008 and later updated. By offering certainty with the rate and term, the FiT improves the business environment and attracts private investment to the renewable energy sector, which ultimately promotes the generation of electricity from renewable sources. The FiT is a key contributor to private development of energy infrastructure in Kenya.

The ERC has since transitioned into the Energy and Petroleum Regulatory Authority (EPRA). The EPRA does not assist electricity utilities with project costs, rather, it impartially approves or disapproves of tariff applications. The EPRA assures the proposed tariff will provide a reasonable return on investment and risk, as well as enable cost recovery for transmission and distribution. At the same time, PPAs are signed that feed into generation tariffs. Generation tariffs look at the return on investment that is expected for different power generators, as well as the associated risk profile. A cost of service study is completed before a tariff application is complete, and the tariff itself is reviewed every three years, as required by local regulations.

[89] Kenya Climate Change Action Plan, "Kenya Launches a Climate Change Action Plan," retrieved from https://www.kccap.info/.

[90] Kenya Ministry of Energy, *Sessional Paper No. 4 on Energy,* (May 2004).

[91] Ibid.

[92] Ibid.

The major reforms in Kenya's electricity sector have resulted in unbundling of a vertically integrated monopoly, establishment of an independent regulator, creation of an efficient and transparent institutional framework, and improvement in the ability and interest of private power producers and other parties to participate in the sector. These changes combined with Kenya's desire to become a middle-income country with a clean and secure environment and equitable, democratic system by 2030 have and will continue to result in significant infrastructure development. Because of its focus on climate change mitigation and adaptation, Kenya is pursuing an energy mix that puts emphasis on renewable energy sources (geothermal, wind, solar, renewable biomass). Building codes are being reviewed to improve climate adaptation and improve energy efficiency.[93]

4.3.2 Concessional Finance in Kenya's Energy Sector

Kenya has previously leveraged both private finance and concessional finance in expanding its electricity sector and undertaking various studies and policy-making activities. Kenya will also require significant financing to achieve its ambitious clean energy development plan. Existing donor financing in the energy sector covers 36 programs, with 20 donors invested in the sector from 2005-2010. Donors are deploying a range of financing tools (grants, mixed grants, and loans) with concessional lending representing 98 percent of current donor financing.[94]

The treatment of concessional finance in Kenya's energy tariff differs depending on the source, type, and purpose of funds deployed, but the impact is always a lower tariff than what would have resulted if the project were financed through commercial sources. The different kinds of concessional finance used in the Kenyan energy sector include:

- **Concessional loans**. Utilities that are backed by the government of Kenya receive public financing that can consist of government-procured concessional loans and equity (financed by shareholders, of which the government is one). Concessional loans to the government that go on to the utility generally support grid-connected projects and have a lower interest rate than commercial loans. The government passes its cost savings to the utility, which ultimately passes on those savings to rate payers: in the calculation of the electricity tariff, the overall cost of capital for the project is reduced by the return of the loan-financed asset.[95]

  This most closely aligns with Example 2.2.4 "Adjusting Costs of Capital Calculation" above, as the utility is able to recover costs on the concessionally financed asset, but the specific amount they recover on the concessionally financed asset is reduced due to the lower interest rate. When an IPP is responsible for project development, they may also finance the project with debt and equity, and sometimes will borrow from DFIs. IPPs are allowed a sufficient rate of return in the tariff and in PPAs to cover the risk.

- **Grants**. In the case of grants, which are often used to finance mini-grid projects,[96] there is no return provided on the grant-financed asset; thus, the asset base is reduced by the amount of the grant. For mini-grids specifically, each development is treated as a separate entity—some financed by grants, others with concessional support from the government or DFIs, and some with neither. Nonetheless, a standard mini-grid model is applied when determining their tariffs

[93] Climate Investment Funds, "International Meeting of the SREP Sub-Committee: Investment Plan for Kenya," (Washington, D.C., 2011)

[94] World Economic Forum, "Unlocking Financing for Clean Energy in Kenya – Workshop Summary," (World Economic Forum, 15 May 2012).

[95] Representatives from Kenya Energy and Petroleum Regulatory Commission (EPRA), interview by Cadmus Team, 16 June, 2021.

[96] Tariffs tend to be higher in the mini-grid space than with the national utility because of the off-grid and smaller-scale nature of these developments, though tariffs are not identical amongst mini-grids themselves. Concessional finance leads to a lower rate than commercial finance here as well.

to ensure uniformity. Grant-financed assets in mini-grid projects are factored into either the CapEx or the Opex. If it is covered under CapEx, the value of the grant-financed asset is reduced from the asset base. If Opex, the value of the grant is reduced from revenue requirements for operations and maintenance.

- **Partial Risk Guarantees**. International financial institutions such as the World Bank sometimes provide concessional finance in the form of partial risk guarantees to cover political risk. These are issued with a government letter of support by the National Treasury, which looks at the feasibility and viability of the project.

Examples of concessional finance in Kenya's energy sector include:

- **Restructuring of KPLC debt**. In 2016, KPLC was the first electric power transmission and distribution utility in sub-Saharan Africa to successfully undergo financial restructuring when it restructured $500 million of existing commercial debt into new longer-term commercial loans. Originally, KPLC had taken on the cost of rural electrification on its own, and was unable to secure long-term concessional loans within the short time frame that it needed, which led KPLC to finance the rural electrification through a combination of commercial debt, overdraft facilities, and internally generated cash.

  In the restructuring, KPLC received concessional financing from the World Bank in the form of $250 million of IDA credit and $200 million of IDA guarantee.[97] The IDA credit was intended to help increase rural electricity access using concessional funds, while the IDA guarantee was designed to restructure the existing commercial debt. Ultimately, using the guarantee KPLC was able to raise $500 million in new commercial debt with a longer tenor, lower interest rate, and two-year grace period. Under the IDA guarantee, lenders would also have direct recourse to IDA for servicing the debt if KPLC were to fail to make timely payments under the loan.[98]

  The concessional financing improved KPLC's liquidity and allowed it to pay its bills, service ongoing debt obligations, and tend to loss reduction efforts and system obligations. This collaboration with the World Bank also helps to lower costs to consumers and expand rural electrification, and indicates market confidence in KPLC's operations.[99]

- **Kenya Geothermal Power Development in Menengai**. Kenya has prioritized developing geothermal energy production as part of its efforts to develop reliable, sustainable, and affordable power (and move away from using hydropower and fossil fuels). The Menengai project was developed by the Kenyan government through the Geothermal Development Company (GDC), to conduct exploration and then sell steam to IPPs.[100] The Kenyan government needed external support in developing a reward-risk ratio and return on investment that would attract IPPs. The reward risk ratio was addressed through development of a partial risk guarantee between the government of Kenya and private developers with support from AfDB. The ROI was addressed through concessional lending by the Climate Investment Funds (CIF) Dedicated Private Sector Program (DPSP II).[101]

[97] Kacaniku et al. "Financial Solutions Brief: Kenya - KPLC Refinancing." (World Bank Group, 2018).

[98] Ibid.

[99] Ibid.

[100] Climate Investment Funds, "Facilitating Geothermal Field Development Through Public-Private Partnerships in Menengai, Kenya," (Global Delivery Initiative, June 2018).

[101] Ibid.

In 2016, CIFs Trust Fund Committee approved $29.65 million in senior loans, out of which $14.65 million would be for long-term concessional debt. $350,000 was also granted for costs related to project implementation and supervision services. AfDB is the implementing MDB for this project, and Kenya is a pilot country under the scaling up Renewable Energy Program (SREP). AfDB anticipated co-financing from the private sector and other lenders in the amount of $82 million.

In reviewing the application for financing, AfDB determined that concessional financing was necessary to enhance commercial bankability, and that KPLC was relatively low risk given the fact that it has never defaulted on any payment to electricity suppliers.[102] CIF and AfDB's support of this project attracted private investors to partake in this public-private partnership with the Government of Kenya. By 2017, due to the reduced risks enabled by the concessional financing and involvement of AfDB and CFI, two IPPs had entered into agreements with GDC to develop steam power plants in Menengai.[103]

4.4 United States

4.4.1 United States Electricity Sector Context

The United States (U.S.) has a developed economy and energy sector, with 1,117,475 MW of total utility-scale electricity generating capacity, roughly 27,724 MW of small-scale solar electricity generating capacity, and a100 percent electrification rate.[104] Electricity is produced using a variety of energy sources, including natural gas (40 percent), coal (19 percent), nuclear (20 percent), petroleum (one percent), and renewables (20 percent).[105] State-level electricity mixes vary significantly based on considerations like local resources, political climate, and whether a state has renewable energy targets.

Like many other sectors in the United States, energy is regulated at the federal, state, and sometimes local level. At the federal level, Congress has the power to set national policies, and the Federal Energy Regulatory Commission (FERC) has the authority to regulate interstate transmission of electricity, natural gas, and oil, and also reviews proposals to build liquefied natural gas (LNG) terminals, interstate natural gas pipelines, and licenses hydropower projects.[106]

FERC derives its authority from several key policies and legislation including the Federal Water Power Act of 1920, the Federal Power Act of 1935, the Public Utility Regulatory Policies Act of 1978 (PURPA), the Energy Policy Act of 1992, and the Energy Policy Act of 2005. State legislatures can also set state-level climate and energy policy, and state public utility regulatory agencies/commissions set cost-reflective tariffs. Tariffs and incentives vary by state.

[102] World Bank, "Cover Page for CTF Project/Program Approval Request – DPSP II – Kenya Geothermal Program," (10 Mar 2016), retrieved from https://pubdocs.worldbank.org/en/632971531831450219/1864-PCTFKE604B-Kenya-Project-Document.pdf.

[103] Climate Investment Funds, "Facilitating Geothermal Field Development Through Public-Private Partnerships in Menengai, Kenya," (Global Delivery Initiative, June 2018).

[104] US Energy Information Administration, "Electricity Explained: Electricity generation, capacity and sales in the United States," (EIA, 18 Mar 2021), retrieved from https://www.eia.gov/energyexplained/electricity/electricity-in-the-us-generation-capacity-and-sales.php#:~:text=At%20the%20end%20of%202020,solar%20photovoltaic%20electricity%20generating%20capacity.

[105] US Energy Information Administration, "Electricity Explained: Electricity in the United States), (EIA, 18 Mar 2021), retrieved from https://www.eia.gov/energyexplained/electricity/electricity-in-the-us.php.

[106] Federal Energy Regulatory Commission, "What FERC Does," (FERC, 19 Nov 2020), retrieved from https://www.ferc.gov/about/what-ferc/what-ferc-does.

4.4.2 Concessional Finance in the United States Energy Sector

While not an emerging economy, the US offers a good example of deploying concessional finance to pilot developments of smart meters and other improvements onto distribution grids through the American Recover and Reinvestment Act of 2009 (ARRA). ARRA was a fiscal stimulus bill comprised of $787 billion in spending to help lift the US economy out of recession. The bill included financial support for American families (tax cuts, tax credits, and unemployment benefits) and funded expenditures related to infrastructure, education, and healthcare.[107]

Notably, the ARRA provided the Department of Energy (DOE) with $4.5 billion to modernize the electric power grid,[108] $3.4 billion of which was used to fund the Smart Grid Investment Grant (SGIG) program. Projects developed using SGIGs began in 2010 and the program ended in 2015.[109] Under the SGIG program, electric utilities could apply for financial assistance in an amount up to 50 percent of the cost of a qualifying advanced grid technology investment.

Qualifying technology included synchrophasor technologies on electric transmission systems, distribution automation (DA) technologies and systems, including advanced sensors and self-healing controls, advanced metering infrastructure (AMI) including smart meters and two-way communication networks, and customer systems, including in-home displays (IHD), programmable communicating thermostats (PCT), and direct load control devices (DLC) that enable utilities to offer time-based rates, direct load control and incentives.[110]

A condition of receiving an SGIG for a utility or other participant was providing specific information, with which the program would create a "smart grid information clearinghouse" that would be publicly available (except for sensitive or proprietary information).[111] The SGIG projects were competitively selected and received federal funding in an amount up to 50 percent of the total cost of the qualifying grid technology investment.[112]

The SGIG program provided funding to 99 competitively selected projects from 228 participating utilities and organizations. It was successful in stimulating economic growth, creating jobs, and improving the nation's electric grid to be more reliable and resilient through use of smart technologies and practices. The program helped the US to reach key grid modernization targets ahead of schedule, helped to grow the smart grid vendor marketplace by creating 12,000 direct jobs by 2012 and 35,000 additional positions throughout the supply chain.

The data collecting component has enabled the program to analyze and share the costs, benefits, and impacts of smart grid technologies, which help to reduce risk and cost for other utilities and participants to engage in smart grid efforts. Finally, because the program issued grants for 50 percent of a project's cost, the program attracted an additional $4.5 billion in private investment, for a total SGIG investment of $7.9 billion. This increased investment helped utilities accelerate their grid modernization plans considerably and broaden the scope of projects to reach more customers.[113]

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[107] *American Recovery and Reinvestment Act,* Public Law 111-5, (111th Congress, 17 Feb 2009).

[108] U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability, "Smart Grid Investment Grant Program Final Report," (DOE, December 2016).

[109] Ibid.

[110] Ibid.

[111] Ibid.

[112] *Smart grid technology research, development, and demonstration, U.S. Code 42 (*2009) § 17384.

[113] U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability, "Smart Grid Investment Grant Program Final Report," (DOE, December 2016).

Although rate setting procedures can vary between states, the general treatment of SGIG grants in rates in the United States is aligned most closely with Example 2.2.5, "Opex Recovery of Costs Associated with Obtaining Concessional Finance." In a California Public Utilities Commission (CPUC) Decision, utility costs associated with the grant were determined as reasonable to be included in the rate base. Those costs include the utility-funded portion of the investment, plus the Opex associated with applying for and receiving the grant.[114] Therefore, ratepayers experience some savings as a result of the grant, but the utility is also compensated for the costs it expends on the Opex to acquire the grant plus matched portion of those projects.

[114] Public Utilities Commission of the State of California, Decision 09-09-029, "Decision Establishing Commission Processes for Review of Projects and Investments by Investor-Owned Utilities Seeking Recovery Act Funding," (CPUC, September 2009).

5 Comparison / Analysis of Case Studies

The sections below detail the successes and failures of the various uses of concessional finance in each country. This will consider the impacts that each case had on private investment, the legal/regulatory environment, financial management, and energy access in each country, as well as how these factors influenced the success or failure of a given instrument, if at all.

5.1 Private Investment

As discussed in Section 1.2.1, concessional and grant financing can either incentivize or disincentivize private investment depending on how the instrument is employed in a given context. To facilitate the growth of the private sector and commercial investment, concessional finance should address a clear barrier and be reserved for facilities and locations where the private sector footprint is minimal, and investors would not proceed without concessional finance.

For most cases discussed in this primer, concessional finance successfully unlocked private sector finance for energy projects:

- In Jamaica, Rockport IPP marks an early example of using MDB financing to successfully unlock private sector financing for a limited resource project, circumventing perceived country risk and a poor regulatory environment.
- In Nigeria, a high-risk investment environment, DFIs provide partial risk guarantees that protect private investors from changes in government policy or the possibility that a government entity will fail to fulfill its end of a contract.
- In Kenya, assistance from the AfDB and the CIF reduced risks in the investment environment and attracted two IPPs to partake in public-private partnerships with the Government of Kenya to develop steam power plants in Menengai.
- While not a high-risk investment environment, the SGIG program in the United States nonetheless stimulated $4.5 billion in private investment by issuing grants for only 50 percent of a project's cost, helping utilities to accelerate grid modernization plans and reach more customers.

In these cases, concessional finance was able to stimulate private sector investment by adhering to the principles outlined in Section 3.1, namely additionality, crowding-in, and reinforcing markets. In cases where the private sector alone cannot provide adequate support, concessional financing was used to provide a level of security not otherwise available on the market.

Additionally, these projects were designed in such a way that incentivized rather than "crowded out" private investment (e.g., by providing grants covering half of project cost). Finally, these examples address market failures present in each country, helping to develop markets responsive to efforts to incentivize the provision of desired goods and services.

5.2 Legal / Regulatory Environment

A sound legal and regulatory environment helps to reduce the risks and increase profitability of private investment tied to concessional finance and allows these investments to achieve commercial sustainability. In some cases, the design of concessional finance instruments facilitated the adoption of policies and reforms that strengthen this environment. In others, the existing legal and regulatory framework allowed for the success of concessional finance interventions.

- Components of CARCEP and the Jamaica Energy Security and Efficiency Enhancement Project strengthened the regulatory framework by providing clear policy directions, regulations, and incentives to mobilize private investment, promote renewable energy policies, and increase

energy efficiency. The program also built institutional capacity to develop and implement energy policies and monitor and evaluate the outcomes.

- Kenya has a strong enabling legal and regulatory environment that includes a plan to expand electrification and the use of renewable sources, an energy policy that reflects the same, an independent regulatory agency, unbundled market inclusion of IPPs, cost-reflective tariffs, and the use of a feed-in tariff. Partially due to this environment, concessional lending represents 98 percent of current donor financing in Kenya.[115]

In other cases, shortcomings in the regulatory environment continue to inhibit certain types of interventions. For example, despite significant efforts to restructure and privatize the electricity sector, Nigeria continues to suffer from limited private investment, and generation fails to keep pace with demand. Additionally, the delays in the bid process resulted in unexpected costs for investors an inhibited the initial privatization of the sector.[116]

5.3 Financial Management

As discussed in Section 1.2.2, the use of concessional finance can have differing impacts on financial management within a country. DFI support should aim to encourage adherence to high standards of conduct, particularly as it pertains to corporate governance, environmental impact, social inclusion, transparency, and integrity. The examples below emphasize cases of concessional financing that improved financial discipline and economic efficiency of the impacted utility.

- In 2016, the restructuring of KPLC's debt allowed the utility to pay its bills, service ongoing debt obligations, improve its liquidity, tend to loss reductions and system obligations, expand rural electrification, lower costs to consumers, and increased market confidence in KPLC operations. KPLC has never missed a payment or defaulted and has a long history of being a credit-worthy off-taker.

- Despite beginning in 2020 and thus being too early to assess the results, the PSRO in Nigeria is providing results-based financing to improve the reliability of electricity supply, achieve financial and fiscal sustainability, and enhance accountability of actors in the energy sector. The World Bank expects the PSRO to improve the financial management in the energy sector through enhanced financial viability and reduced tariff shortfalls.

Similarly, poor financial management within a utility can inhibit the success of a concessional intervention. For example, in Nigeria, poor management within the energy sector during privatization efforts led to unforeseen challenges in the initial acquisition of generation and distribution assets and severe liquidity challenges plagued the sector.

As discussed in Section 4.2.2, repeated revisions to the bid timetable for the takeover of successor companies extended the takeover date and led to distortions in revenue projections. Similarly, these delays were not anticipated when negotiating the terms of the loans, and thus led to huge interest accumulations, requiring investors to renegotiate financing arrangements to align with current realities.[117]

5.4 Social Returns

As mentioned, one of the goals behind concessional financing is to balance the private and social returns of an energy project. This can be achieved through increased energy access, incentives for

[115] World Economic Forum, "Unlocking Financing for Clean Energy in Kenya – Workshop Summary," (World Economic Forum, 15 May 2012).

[116] KPMG, "A Guide to the Nigerian Power Sector," (KPMG Nigeria, 2016).

[117] KPMG, "A Guide to the Nigerian Power Sector" (2016).

clean energy development, modernization of the electric grid, and other outcomes. Several of the concessional finance instruments discussed in Section 4 led to noteworthy social returns, including:

- In Jamaica, CARCEP's Clean Energy Innovation Fund accelerated financing for clean energy and bolstered energy efficiency initiatives in the country. By requiring recipients to acquire and leverage outside funding, the program also developed incentives to unlock private sector financing for clean energy.
- The SGIG program in the United States allowed the country to reach grid modernization targets ahead of schedule, create thousands of jobs and a data-sharing program, and reach customers that would have otherwise been inaccessible.

These projects are significant in that they yield a clear social return, whether by incentivizing investments in clean energy or expanding energy access to poor and vulnerable populations. In doing so, these projects adhered to the principles of reinforcing markets and additionality. Markets are reinforced through efforts to encourage the maximum delivery of social and economic outcomes and compensating going beyond standard practice in the sector, as in the case of clean energy investments in Jamaica. These projects also demonstrate additionality by targeting areas where the social return would not be viable with private finance alone.

6 Conclusion / Recommendations / Instructions for Decision Making

6.1 Summary of Treatment of Concessional Finance in Electricity Rates in Case Study Countries

As can be gathered from the case studies above, concessional finance is treated differently depending on the context in which it is implemented. Depending on its treatment, concessional finance products can lead to changes in electricity prices, utility access to capital, and a utility's return on investment. Regulators should carefully consider how to account for concessional finance when setting electricity rates. Additionally, regulators and financiers should adhere to the principles outlined in Section 3.1, including additionality, crowding-in, commercial sustainability, reinforcing markets, and promoting high standards.

These principles ensure that a concessional finance intervention encourages private sector investment; leads to a net positive difference; balances economic, environmental, and social impacts; addresses market failures and minimizes the risk of market disruption; and upholds high standards in the areas of corporate governance, the environment, social inclusion, transparency, and integrity. The case studies identified in this primer treated concessional financing as follows:

- In Jamaica, the energy sector has reached a degree of maturity wherein concessional finance is not utilized out of concern that it will distort the commercial finance market. As a result, concessional finance is not considered in their rate design. Nonetheless, concessional finance, if used to finance Jamaican energy utilities, would theoretically lead to decreased electricity rates because the lower cost of capital would reduce the revenue requirement. Despite the limited experience of electricity utilities in using concessional finance, this does not mean that the sector does not benefit from support from IFIs. Institutions such as the World Bank and the IDB instead direct their efforts to improve the policy, legislative, and regulatory environment; incentivize energy efficiency and the development of renewable energy sources; and as support to commercial investment in the sector.
- In Nigeria, concessional finance is treated differently depending on whether the regulator, NERC, was involved in securing the finance. If NERC is not involved, concessional finance is built into the five-year tariff, wherein Nigerian DisCos are expected to raise appropriate finance to meet the tariff. Here, the WACC is considered a reasonable return, thus utilities do not need to pay a difference if they earn more or less finance than required and may earn a return on concessionally-funded assets, passing savings to customers. If NERC is involved in securing concessional finance, an approved rate of return is tied to the financed asset, reflecting the actual rate of return. Thus, the utility does not receive a return on these assets.
- In Kenya, concessional lending represents around 98 percent of donor financing as of 2012. [118] In Kenya, treatment of concessional finance in the energy tariff depends on the source, type, and purpose of the funds deployed, though all cases result in a lower tariff than would be achieved through commercial financing. These different treatments include:
    - In the electricity tariff, the overall cost of capital for the project is reduced by the return of a loan-financed assets, meaning cost savings from concessional loans (as compared to commercial loans) are passed from the government to the utility and ultimately onto ratepayers.

[118] World Economic Forum, "Unlocking Financing for Clean Energy in Kenya – Workshop Summary," (World Economic Forum, 15 May 2012).

  - No return is provided on **grant-financed assets**, which are applied to either the CapEx or the Opex. If the asset is applied to CapEx
  - x, the value of the grant-financed asset is reduced from the asset base. If the asset is applied to Opex, the value of the grant is reduced from revenue requirements for operation and maintenance. In either case, in the result is cost savings for rate payers.
  - **Partial risk guarantees** are also provided by IFIs such as the World Bank and are used to cover externalities such as political risk. These do not receive special treatment in the electricity tariff, instead providing coverage to funders in the case of default by a power utility.

- The electricity sector of the United States is too decentralized and varied by state/municipality to draw concrete conclusions on the treatment of concessional finance. However, the SGIG program under the ARRA provides an example of how concessional funds (in this case, grants) can be leveraged to update electricity infrastructure. This program issued grants for 50 percent of costs for new technology investments for 228 participating utilities, stimulating an additional $4.5 billion in private investment. In California, the CPUC permits utilities to include the utility-funded portion of the smart-grid investment plus the Opex associated with applying for and receiving the grant in the rate base.

There is no single correct method to account for concessional finance, and the best fit solution is highly dependent on the local context facing a given utility, including economic conditions, social development, and political considerations. Regulators and policymakers coordinate to craft the best treatment of concessional finance for their utilities given this context. While it can be difficult to determine the correct treatment of concessional finance for their country, there are several key factors that should be considered to address concessional finance in the design of electricity rates.

6.2 Key Considerations for Addressing Concessional Finance in Rate Design

When implementing concessional finance interventions, DFIs and regulators should carefully consider how a given intervention can impact or be impacted by **private investment** in the power sector, **financial management**, the **regulatory environment**, and the **desired social outcomes**. When properly structured, concessional finance interventions can lead to significant improvements in these areas. However, poorly designed interventions can undermine their intended impact. Regulators should understand and assess potential risks, costs, and benefits of a project in order to ensure that a concessional finance product has its intended effect.

- **Private Investment**. In order to facilitate the growth of the private sector and the role of commercial investment in the energy sector, concessional finance should address a clear barrier and be reserved for cases where private sector involvement is limited and/or where a reasonable investor would not proceed without the benefit of concessional finance. To stimulate private investment, concessional finance interventions should consider the concepts of **additionality, crowding-in,** and **reinforcing markets.**

- **Financial Management**. In the design of concessional finance packages, regulators and donors should consider how this finance could improve or disincentivize financial management. For example, the clear repayment terms of loans have the potential to promote economic efficiency and improve financial discipline, fiscal revenues, and investment rates and promote economic efficiency, yet loans may also accumulate into an unsustainable debt burden that countries (particularly LDCs) are unable to repay. Similarly, a poorly designed grant can disincentivize budgetary discipline, but performance grants can be leveraged to incentivize host country reforms to improve financial management. Concessional finance should encourage adherence to high standards of conduct as it pertains to corporate governance, environmental impact, social inclusion, transparency, and integrity.

- **Regulatory Environment.** The effectiveness of concessional finance interventions can be highly dependent on the regulatory environment within a host country. A strong legal and regulatory environment (with clear and contextually appropriate policies regarding foreign investment, energy tariffs, grid regulations, permitting, and subsidies) can decrease risks and increase the profitability of private investment tied to concessional finance, enabling such investments to achieve commercial sustainability. The design of concessional finance interventions can also facilitate the adoption of policies and reforms that strengthen this environment and build institutional capacity, such as changes in policy or rules on foreign investment and contractor participation.

- **Social Outcomes.** In the design of electricity rates, grants and concessional finance may require special consideration to ensure the maximum benefit of an intervention is achieved. Generally, this can be reflected in the extent to which customers shoulder the burden of capital not financed by utilities. The way in which concessional funding is treated in electricity rate design can reduce customers' electricity bills, freeing additional income to be used on other household expenditures such as food or educational costs. Outside of rate design, concessional financing can lead to other positive social outcomes by enabling the development of additional energy infrastructure (thereby increasing energy access) or incentivizing the development and wider-scale adoption of energy efficient or renewable energy technologies.

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