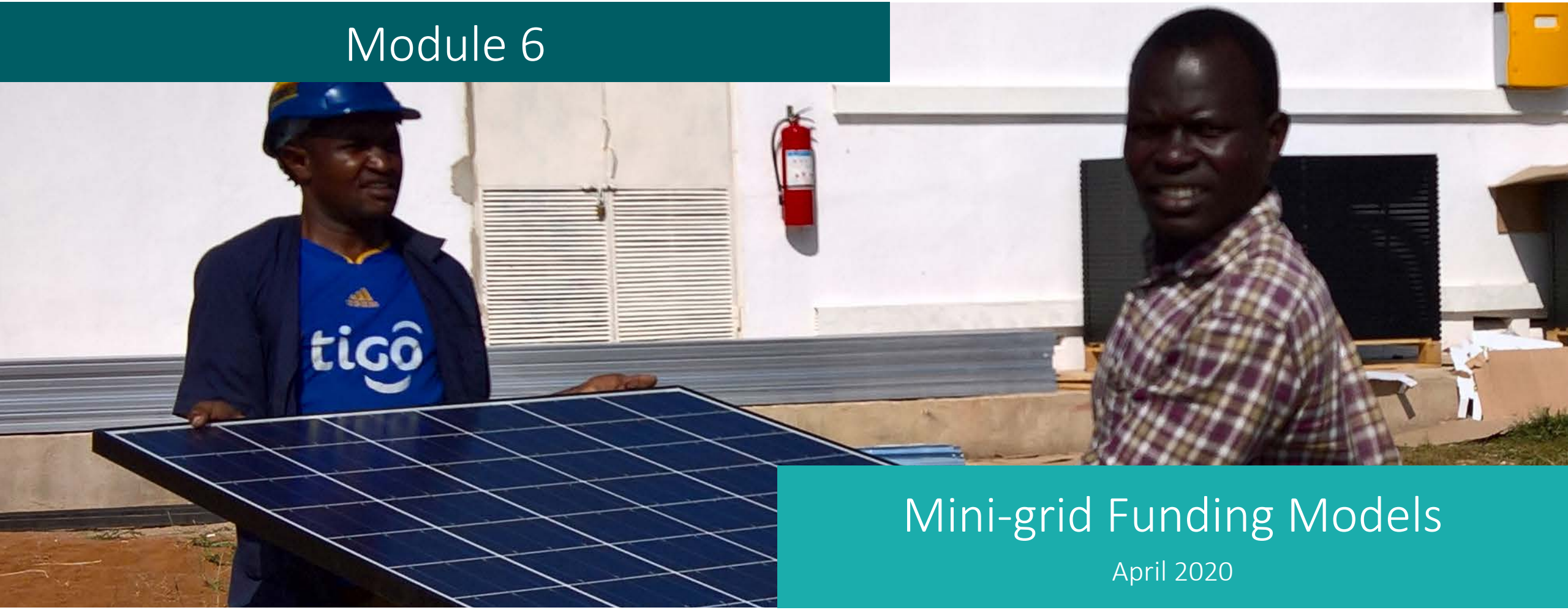
GREEN MINI-GRID HELP DESK

Module 6



Mini-grid Funding Models

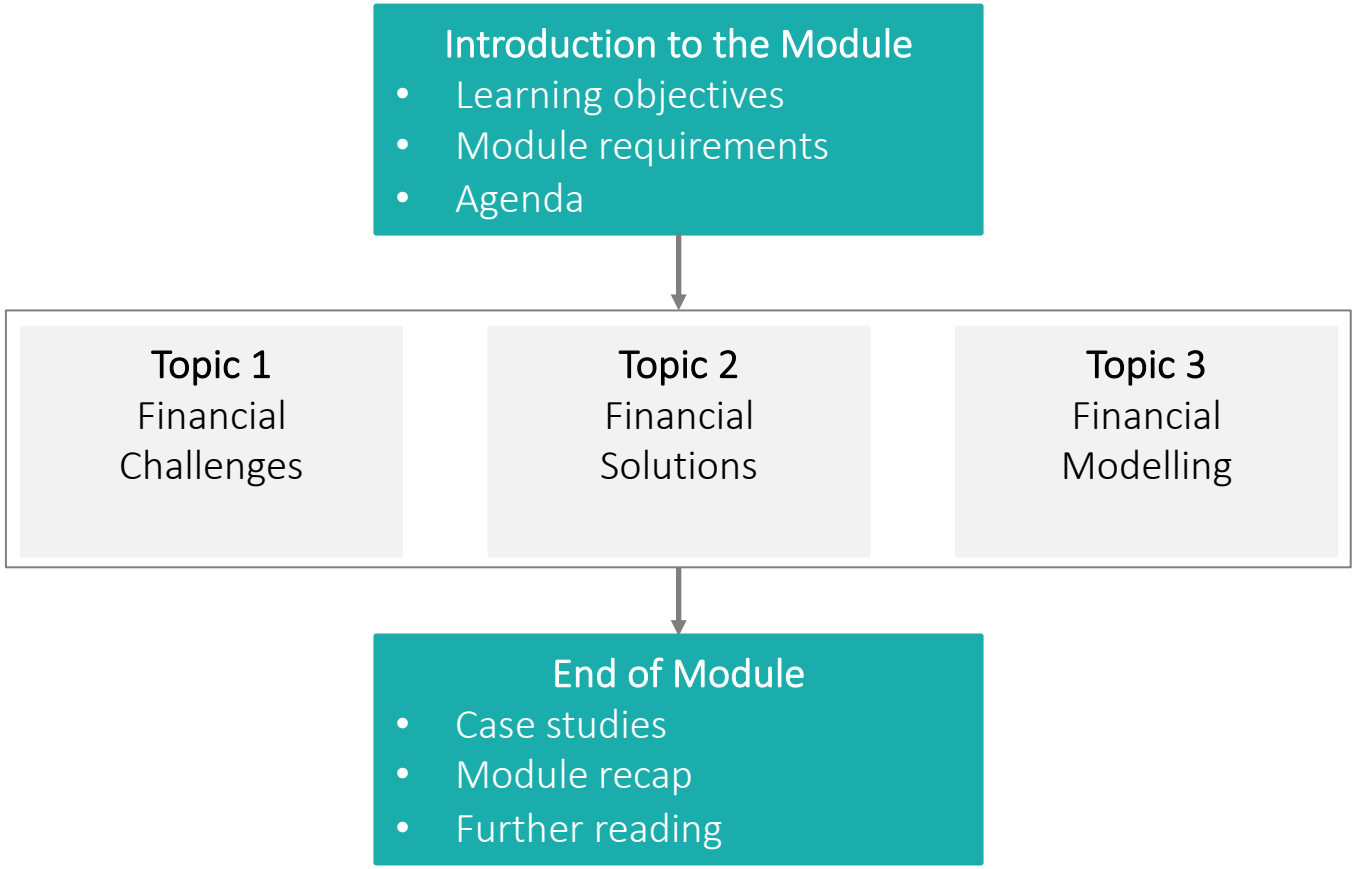
April 2020

ENERGY4IMPACT
ACCELERATING ACCESS TO ENERGY

INENSUS

SUSTAINABLE ENERGY FUND FOR AFRICA

Module overview



Objectives & Requirements

Learning Objectives

- Learn about the financial risks and challenges for mini-grid developers and their funders.
- Learn about the wide range of financial products and solutions available to developers.
- Includes an introduction to financial models for non-financing specialists and case studies of innovative funding models

Module Requirements

- This module is targeted at mini-grid developers and operators at all stages of development.
- They are expected to have a basic understanding of rural, off-grid energy markets and community dynamics in developing countries.
- No specialist financing knowledge is required.

Agenda

1. Financial challenges

- Risk for investors
- Technology challenges
- Developer challenges

2. Financial solutions

- Financial products and providers
- Financial products by project size
- Financial products by project development stage
- Corporate vs. project financing vs. end user finance
- Financial support schemes
- Results-based financing
- Strategic investors
- Crowdfunding
- Crowdfunding case study
- Export credit
- Loan guarantees
- Investor Pitches and Request for Proposals

3. Financial modelling

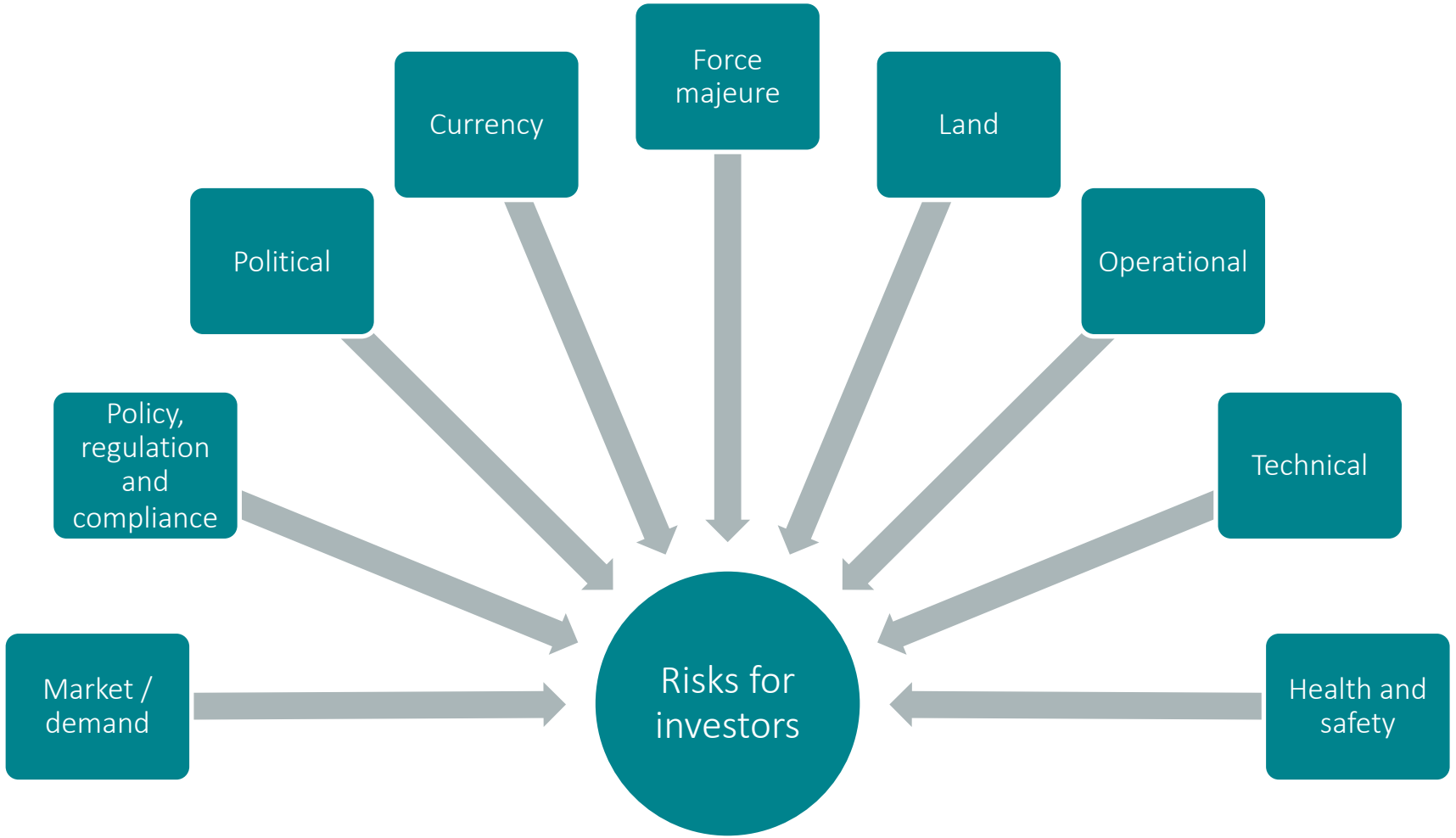
- Definition
- Why do financial modelling ?
- Structure, inputs and outputs

4. Case studies

- Developer case studies
- Fund case studies

Financial challenges

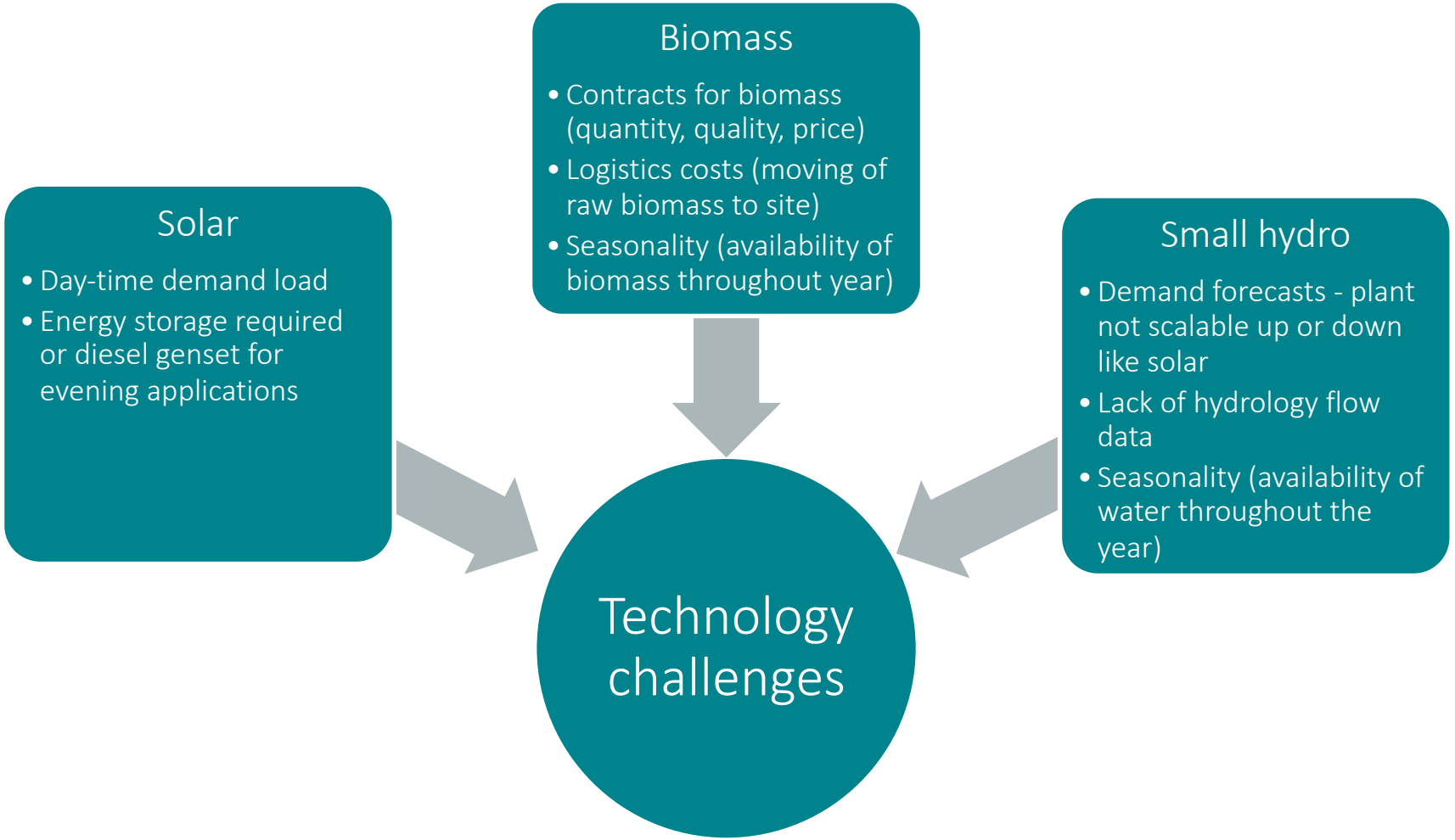
There are a lot of potential risks …



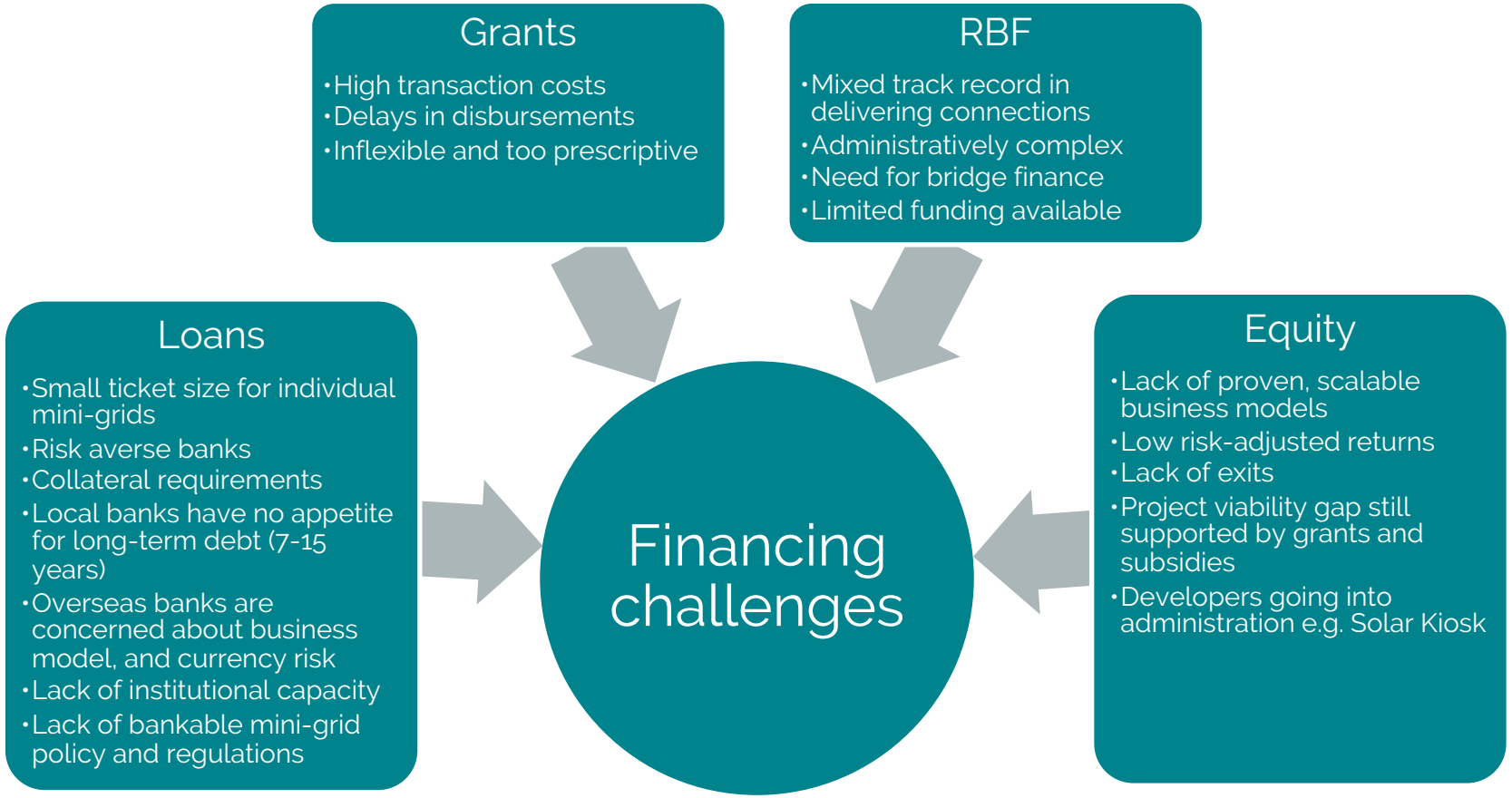
… but two key risks stand out

Risk	Description	Mitigation strategies
Policy / regulation / compliance	Lack of mini-grid regulations Licencing Cost reflective tariffs Arrival of main grid Technical regulations Fiscal policy	Lobbying Smaller projects may be unregulated / licence exempt Consider unregulated time and flat rate tariffs Sell services that make use of electricity, but not electricity itself Grid less likely to arrive at remote projects e.g. islands Develop grids that are technically compatible with main grid
Demand	Demand (revenue) does not increase as expected. Based on ability and willingness to pay Electricity generation and load profiles not aligned No long-term contracts. Monthly pre-pay is norm	Demand assessment Community engagement / trust Demand management Productive use support Tariff design Revenue collection / prepay End user finance

Technology challenges



Challenges for developers



Financial products and providers

	Grants and subsidies	Equity	Debt
Types	Most mini-grids rely on grants and subsidies for at least 30% of the investment costs. Grants and subsidies can be used for: • Grants for feasibility studies • Construction grants for capex – focus on distribution assets • Results-Based Financing e.g. for new connections • Promotion of productive users - technical assistance / purchases of electrical equipment	Most developers require capital from equity investors. Equity can be used for: • Seed capital • Expansion capital • Investments in operating assets	So far very few mini-grids have secured loans. Loans can be used for: • Concessional or commercial loans • Green credit lines to local banks • Loan refinancing facilities • Loans to governments for mini-grid equipment, perhaps backed by export credit guarantees • Loans to end users for electrical equipment, perhaps backed by loan guarantees
Providers	DFIs, host governments, trusts and foundations, philanthropists, crowd funding	Angel investors, VC, impact investors, trusts and foundations, strategic investors, private equity, family offices, crowd funding, DFIs	DFIs, banks, foundations, family offices, crowd funding
Route to market	Public tenders, reverse auctions	Direct or indirect via funds	Direct or indirect via funds

Financial products by project size

	Type 1	Type 2	Type 3
Size	1-10 MW	100 kW – 1 MW	< 100 kW
Main customers	Anchor load, e.g. semi-industrial, supplying excess to state utility	Small businesses or anchor load	Households or small businesses
PPA	Yes	Yes/No	No
Payment	Post pay	Post pay or pre-pay	Pre-pay
Financial product	Commercial equity and debt, grants for connections Corporate or asset finance or project finance	Grants and equity required. Debt starting to be used Corporate or asset finance. Project finance possible if mini-grids are clustered.	Grants and equity required. Debt starting to be used. Corporate or asset finance. Project finance possible if mini-grids are clustered.

Financial products across project life cycle

	Early Stage	Late Stage	Implementation
Project Milestones	• Pre-Feasibility / Feasibility study • Site identification / Initial community engagement • Demand assessment • Renewable resource assessed – solar, hydro, biomass, etc. • Technical design • Anchor clients or small business users identified	• Finalised business / Financial model • Land rights approved • ESIA completed • Water rights secured • Licences secured • Tariffs approved • Rules for community engagement • Tender for equipment supply	• EPC and O&M contracts in place • Procurement & logistics completed • Construction started • Financing secured • PPA secured • Arrangements with small business users in place e.g. contracts, payment systems • Mini-grids in operation and looking to expand
Financial Product	Grants or equity, corporate debt if strong balance sheet	Grants, equity, corporate debt if strong balance sheet, possibly concessional debt	Grants, equity or debt

Corporate vs. project vs. end user finance

	Corporate Finance	Project finance	End user finance
Definition	Borrower = corporate developer. Investment based on historical track record of developer and income projections of portfolio	Borrower = project company. Investment based on income projections of individual mini-grid or group of mini-grids	Borrower = rural end user. Investment based on viability of end user business and available collateral. May be funded directly by developer or through local financing institution. May be in form of grant or loan
Mini-grid type	Suitable for mini-grids of Type 1, 2 and 3	Most suitable for Type 1 mini-grids with anchor clients that offer long-term contracted revenue streams	Not dependent on type of mini-grid
Flexibility	More freedom for developer on how they use funds, e.g. between different projects	Funds only to be used for project(s) specified in financing agreement	Developer or local FI determine which end users to support
Financial risk	Balance sheet impact on developer	Project risks shared between stakeholders	Potential balance sheet impact if funded through developer's own balance sheet. Not an issue if grant-funded or financed through local FI
Time	Shorter time to execute financing	Financing takes longer to execute	Relatively quick as loan amounts much smaller
Complexity	Simpler / less due diligence	Complex / more due diligence	Collateral from end user may be important.
Cost	Lower up-front costs	Higher up-front costs	Depends whether financing from developer or local FI
Length	Shorter-tenor financing (up to 5 years)	Longer-tenor financing (7-12 years)	Short term financing (usually less than a year)

Financial support schemes

Grant and subsidies

- **Up-front payment** of grants or subsidies
- **Public investments**, usually in mini-grid **distribution assets**
- Payments based on results (**results-based finance** or RBF)
- **Competitive tenders**, which include a public investment or grant element (the Pre-Developed Mini-Grid Tender)
- **Tariff subsidies** to bridge the viability gap
- **Repayable grants** which are repaid prior to distribution of dividends or sale of assets

Other support

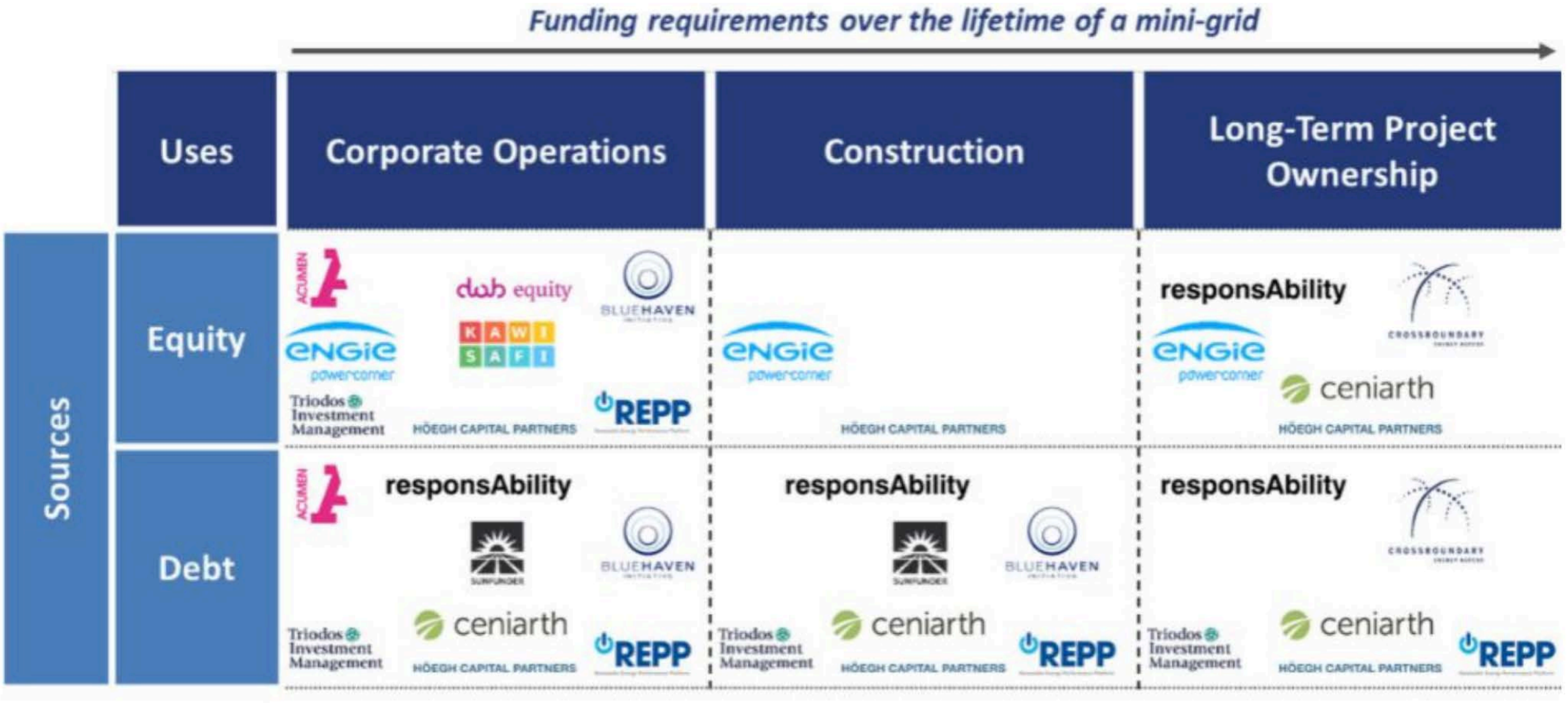
- **Concessionary loans** (single digit rates if possible)
- **Longer-tenor loans** (to allow time for demand to build up and to match the project payback period, which may be 7-15 years)
- **Local currency loans** (reflecting the fact that the revenues are in local currency)
- **Guarantees** to de-risk projects
- **Index local currency tariffs** to hard currencies

Results-based financing

- Links payment of subsidies based on results
- Fixed grant per customer connected
- No upfront payment
- RBF suitable for both government and developer-initiated projects
- Developers initially have to raise their own financing
- Should make bridge financing easier because RBF grant can be used to repay loan

Please refer to Module 8 on Policy and Regulation for more information

Funding mini-grids across project life cycle



Source: **Power4All (June 2019).**
https://www.powerforall.org/application/files/6715/6018/2055/Mini-Grid_Investor_Position_Paper_FINAL.docx.pdf

Strategic investors in mini-grids (1)

Strategic investors have 3 routes to market based on risk tolerance:

- Direct investments and M&A (Mergers and Acquisitions)
- Commercial partnerships and JVs
- Indirect investments (funds and intermediaries)

Source: WoodMac and Energy 4 Impact (2019)

Strategic investors in mini-grids (2)

Direct investments and M&A

- **Commercial return** expectations
- Interest in capitalising promising ventures for **future investment**
- Minority stake for **seat on board** to glean learnings
- Better valuing and **sizing market opportunity**
- **Synergistic** operational fit

Source: WoodMac and Energy 4 Impact (2019)

Strategic investors in mini-grids (3)

Commercial partnerships and JVs

- Allow **diverse array of technical partners**
- **Leverage internal resources** like R&D, marketing etc
- **Low-risk** avenues to exploit operational synergies, gain learning, and leverage distribution network and on-ground market expertise of credible partners
- Many motivated by strategic plans or targets to be operating in multiple markets by 2030

Source: WoodMac and Energy 4 Impact (2019)

Strategic investors in mini-grids (4)

Indirect investments (funds and intermediaries)

Most investments by volume are in **managed funds**

Benefits for strategic investors

- Vehicle for diversified **co-investment** with other limited partners
- **Decreased diligence** and direct administration needs for venture teams
- **Geographically diversified** risks and learnings

Source: WoodMac and Energy 4 Impact (2019)

Crowdfunding for mini-grids is hard …

Process of **raising funds from individuals** to fund project / business

Potential source of **debt, equity and donations**. Almost exclusively online.

Global Crowdfunding (CF) market for energy access was **$31.2m in 2018**, of which 88% peer-to-peer business loans[i].

Unlike solar home systems, CF has not been used widely for mini-grids due to perceived higher risk.

Peer-to-peer **CF loans not well suited** for mini-grids:

- Mini-grids require long-term debt (7-15 yrs.)
- CF loans are short-term (<=7 yrs.) and have regular repayments (typically every 6 months)
- CF loans are also mainly in hard currency

[i]Source: Energy 4 Impact (2019).

… but it has happened

CF platforms lending to mini-grid projects.

e.g. Bettervest (4 projects in Nigeria and 2 in Madagascar)

Experiments using crowdfunding for **financing end-users** / purchasing grid. e.g. PowerGen and Kiva

CF may be used in future for **bridge funding for RBF** where there is clear, short-term exit.

Crowd may in future also participate in **syndicated loans** arranged by others.

Crowdfunding platforms

Reward/ Donation

GlobalGiving

INDIEGOGO

CO2OL EFFECT™

KICKSTARTER

Pozible

M-Changa

1%club
Do-good engagement

UpEffect

Catapoolt
Let's start the Next

Equity

crowdcube

SYNDICATE ROOM
Intelligent Equity Crowdfunding

SEEDRS

FundedByMe™

Debt - SMEs

lendahand
mesofinance

ENERGISE AFRICA

TRINE

bettervest
nachhaltig · effizient · rentabel

Debt - micro enterprises

kiva

BABYLOAN

Crowdfunding case study – Bettervest

- Havenhill Synergy Ltd is a Nigerian EPC contractor and developer of solar-battery mini-grids. Bettervest is a German peer-to-peer business lending platform. In 2018 Havenhill commissioned its second mini-grid project in Kwaku near Abuja. The project comprised a 41.6kWp PV generator, 178 kWh of batteries and a distribution grid of 4.6km.
- Havenhill raised a EUR 114K loan through Bettervest for the project in early 2018[i]. The EUR 153K project was partly funded by a USADF grant ($50K).
- Havenhill attracted 233 investors in 65 days and exceeded its target (EUR 60K). Investors receive an 8.25% yield, while Havenhill pays a premium on this to cover the costs of Bettervest.
- Havenhill commissioned its first 21 kWp solar battery mini-grid pilot in 2017 and started operation in early 2018.
- The AfDB Green Mini-Grid Help Desk has played a key role in the development of Havenhill's mini-grid projects since 2016, including the successful crowdfunding raise.

Yield: 8.25% (for investors)

Term: 7 years

Funding Amount: EUR 113,700

[i]Source: Bettervest (2019)

Export credit (1)

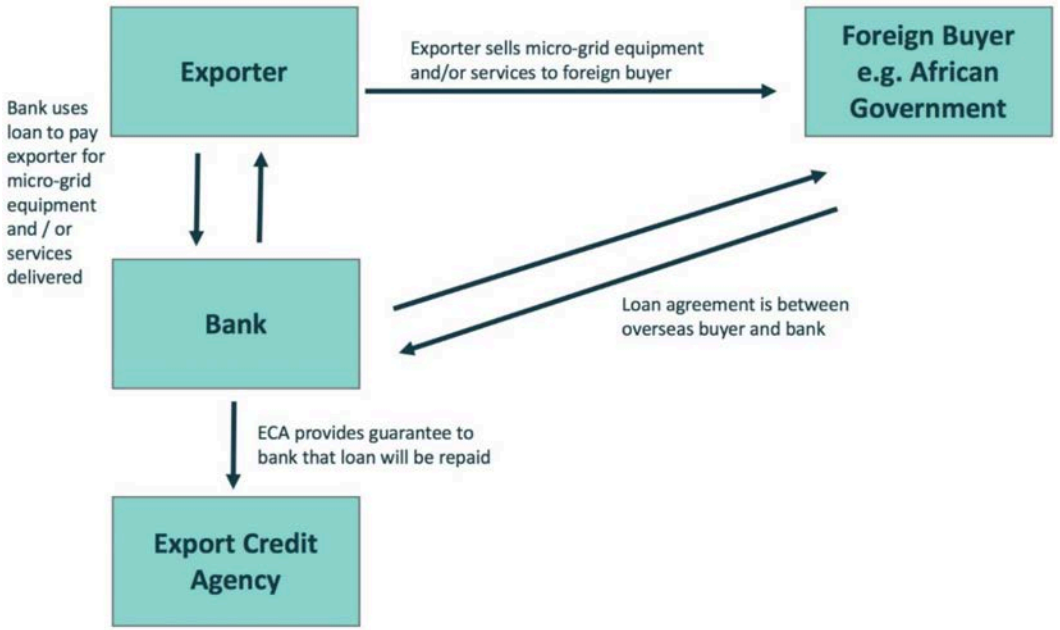
- Export credit agencies **promote exports** for national governments
- Facilitate **competitive long-term funding**
- Provide **guarantees and insurance** to exporters and their banks **against risk of non-payment by foreign buyers**
- Best suited for **larger transactions (>$20 million)**, so unlikely to work for mini-grids unless bundled
- Some mini-grid developers / equipment suppliers planning **multi-million dollar sales of equipment to African governments**

Export credit (2)

Use export credit finance to sell mini-grid technologies to African governments and manage units on their behalf

Main benefits

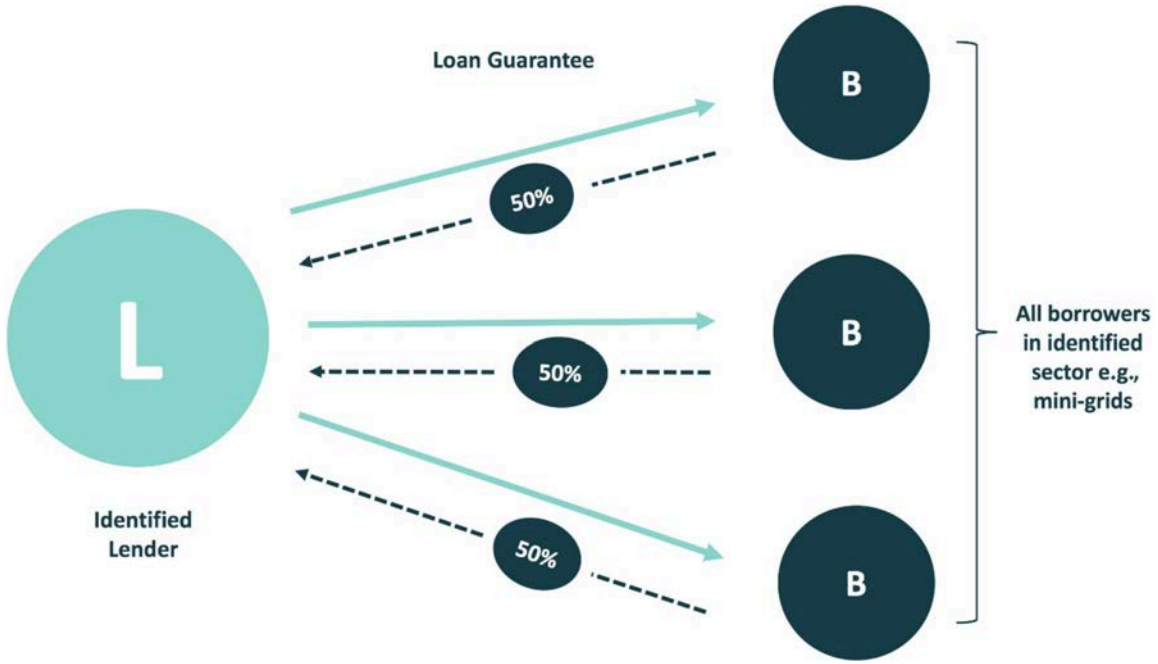
- Exporter can secure **larger orders** and is paid like a **cash contract**
- Government buyer can **borrow for many years at very competitive fixed interest rates**
- Banks are largely shielded from political and mini-grid risks
- **Risks can be allocated** to parties that are most able to handle them



Source: Energy 4 Impact, NREL (2018, November), page 25.

Loan guarantees

- A loan guarantee is a promise by a guarantor to a lender to **assume debt obligations of mini-grid borrower**
- A **loan portfolio guarantee** allows for multiple borrowers which can be smaller in size
- Guarantees a portfolio of loans made by a lender to a **target borrower segment** (e.g. mini-grid developers and projects) based on **pre-defined parameters** (e.g. geography, technology, business model)
- **Terms of guarantee**: portfolio limit, coverage rate, maximum loan tenor, currency and guarantee premium



Source: Energy 4 Impact, NREL (2018, November), page 10.

Investor pitches and request for proposals (RFP)

Investor pitch deck

- Persuade potential investors to invest in a project/business
- More info available online: Forbes (2018 & 2019), Bplan (2019)

RFP

- Project funding announcement made by organisations (e.g. government agencies)
- Source of projects & funding for mini-grid developers
- outlines the bidding process & contract terms, and guides how the bid should be formatted
- used to get the lowest bid from multiple bidders

Example pitch-deck structure:

1. The problem
2. Your solution
3. The market opportunity
4. Business model
5. Early successes
6. Customer acquisition: marketing and sales strategy
7. Team track record
8. Budget and financial projections
9. Competitor analysis
10. Funding Needs
11. Exit Strategy

Definition of financial model

The process of creating a summary of a company's expenses and earnings in the form of a spreadsheet that can be used to calculate the impact of operational decisions (e.g. tariff choice) and other factors or events on profitability & viability of the mini-grid.

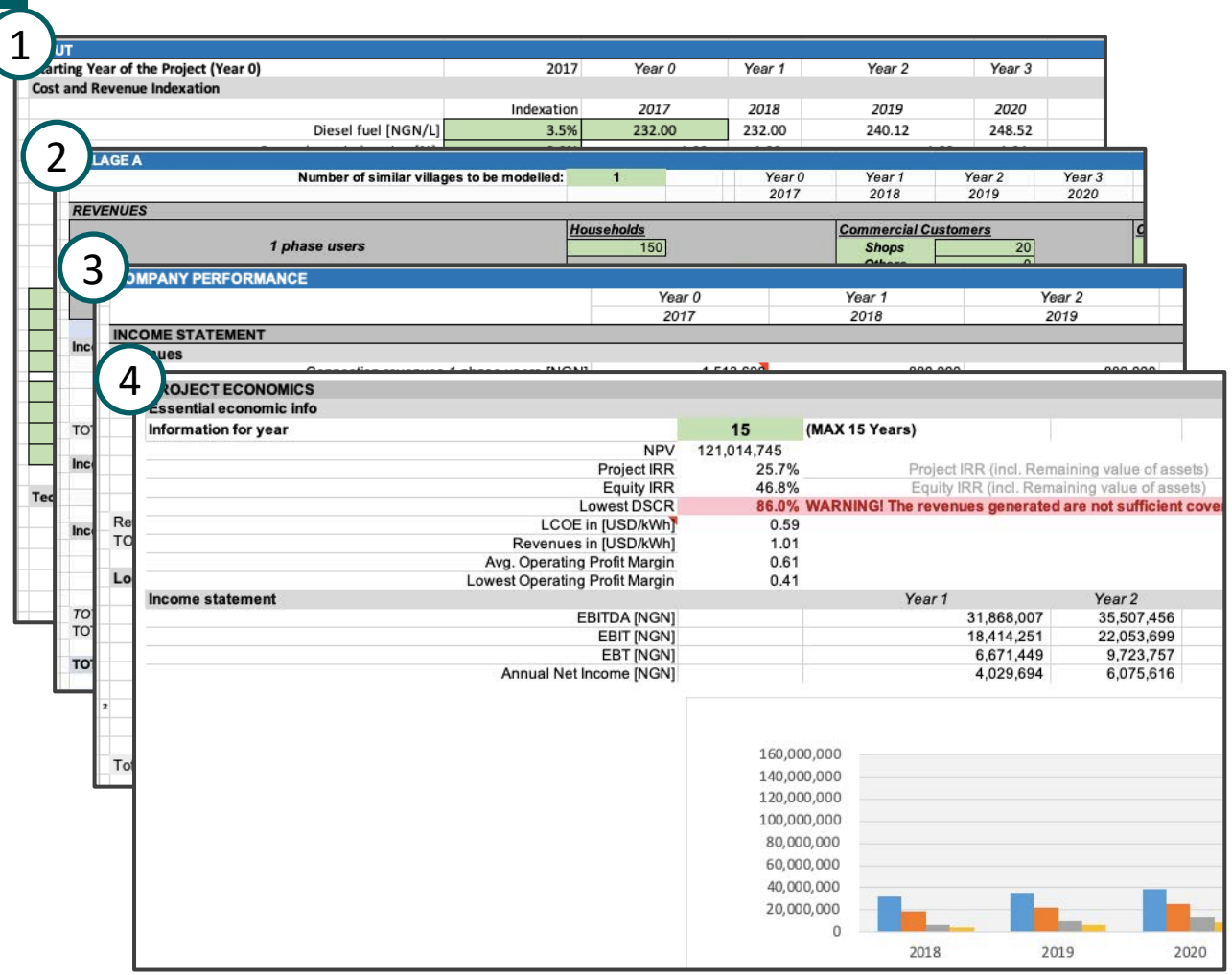
Benefits of financial model

- Forecast the financial performance of the mini-grid
- Inputs can be adjusted to test the business' sensitivity to different business decisions or external events
- Financial models should be designed with the objective in mind e.g internal finance purposes, external capital raising
- Benefits:
  - Provides quick answers
  - Risk assessment tool
  - Required by potential investors and other stakeholders
- Caution: Need to get input assumptions correct

Financial model structure

Usually built in spreadsheet software:

1. Input sheet with all assumptions
2. Calculation sheets for various components such as CAPEX, OPEX, loan, revenues
3. Financial statement sheet with income statement, cashflow statement, and balance sheet
4. Output sheet with key performance indicators and values coming from the financial statements



Financial model inputs

Revenues

- Energy consumption profile from demand assessment
- Tariff structure
- Connection fee

Costs

- CAPEX
- OPEX

Macroeconomic values

- Taxes
- Inflation
- Fees
- Interest rates

Financial information

- Total investment amount
- Percentage for grant, equity, and debt
- Loan terms

Technical values

- Uptime and energy losses

INPUT			
Starting Year of the Project (Year 0)	2017	*Year 0*	*Year 1*
Cost and Revenue Indexation			
	Indexation	*2017*	*2018*
Diesel fuel [NGN/L]	3.5%	232.00	232.00
General cost indexation [%]	2.0%	1.00	1.00
Should reinvestment costs adjusted by an Index?	Y		
Indexation for reinvestments	2.0%	1.00	1.00
Exchange rate USD - NGN	5.0%	400	420
	%	NGN/kWh	
Tariff 1 (1 phase users)	6.5%	250	266
Tariff 2 (1 phase users)	6.5%	305	325
1 phase users Fixed charge	6.5%	120	128
1 phase users Metering costs	6.5%	160	170
Tariff 3 (3 phase users)	6.5%	220	234
Tariff 4 (3 phase users)	6.5%	200	213
3 phase users Fixed charge	6.5%	100	107
3 phase users Metering costs	6.5%	150	160
Technical			
Technical uptime	99%		
Collection rate	99%		
Distribution Grid losses	8%		
Percentage of sales from production	90%		
Financing		in [USD]	
TOTAL investment [NGN]	169,791,811	424,480	
Grant for ASSETS [NGN]	8,489,591	Share	5.0%
Grant for PROJECT DEVELOPMENT COST [NGN]	8,489,591	Share	5.0%
Village contribution [NGN]	16,979,181	Share	10.0%
Private investment [NGN]	135,833,449		
Debt from investment costs (minus grant)	70%	95,083,414	
Equity from private investment costs	30%	40,750,035	

Example input sheet

Financial model outputs

Income statement

- EBITDA
- EBIT
- EBT
- Net income and cumulative net income

Cash Flow Statement

- Cash flow and cumulative cash flow
- Free Cash Flow to the Firm (FCFF) and Free Cash Flow to Equity (FCFE)

Balance Sheet

Performance indicators

- Project and equity NPV
- Project and equity IRR
- DSCR
- LCOE
- Payback period

Year Number	(7)	(6)	(5)	(4)	(3)	(2)
Year	2012	2013	2014	2015	2016	2017
PROFIT AND LOSS ACCOUNTS						
Revenues	53,601	160,993	125,507	150,721	163,592	178,130
Operating & Maintenance Costs	(163,478)	(172,415)	(194,405)	(238,126)	(182,498)	(218,232)
EBITDA	**(109,878)**	**(11,422)**	**(68,898)**	**(87,405)**	**(18,906)**	**(40,102)**
Depreciation	-	-	-	-	-	-
EBIT	**(109,878)**	**(11,422)**	**(68,898)**	**(87,405)**	**(18,906)**	**(40,102)**
Interest	-	-	-	-	-	-
EBT	**(109,878)**	**(11,422)**	**(68,898)**	**(87,405)**	**(18,906)**	**(40,102)**
Corporate tax	-	-	-	-	-	-
Total Tax	-	-	-	-	-	-
Net Income	**(109,878)**	**(11,422)**	**(68,898)**	**(87,405)**	**(18,906)**	**(40,102)**
10% to MWER	-	-	-	-	-	-
Net Income minus 10% to MWER	**(109,878)**	**(11,422)**	**(68,898)**	**(87,405)**	**(18,906)**	**(40,102)**
Cummulative Net Income						
CASH FLOW						
Revenues	53,601	160,993	125,507	150,721	163,592	178,130
Operating & Maintenance Costs	(163,478)	(172,415)	(194,405)	(238,126)	(182,498)	(218,232)
Tax	-	-	-	-	-	-
Working Capital	-	-	-	-	-	-
Operating Cashflow	**(109,878)**	**(11,422)**	**(68,898)**	**(87,405)**	**(18,906)**	**(40,102)**
CAPEX incl. extension	-	-	-	-	-	-
Investing Cashflow	-	-	-	-	-	-

Example output sheet

KIS – multi-utility case study

- Kalangala Infrastructure Services (KIS) is a **$49m mixed utility** in Uganda which includes a **ferry service, a trunk road, an energy project and a water supply system**. The company, which is located on Bugala Island on Lake Victoria in Kalangala District, has a **1.6-MW solar diesel** power system that cost about $16m.
- The multi-utility model played a key part in the successful financing of KIS. The project's backers took comfort from the **revenues generated by the long-term government contracts** for the ferries and the road and therefore were able to accommodate the revenue and demand uncertainty around the power business.
- KIS used a mixture of **equity from DFIs, and DFI and commercial debt backed by guarantees**. It also received an **output-based grant to subsidise connections**. Debt financing was provided by Emerging Africa Infrastructure Fund (a DFI) and Nedbank Capital (a commercial bank). Joint debt guarantees were provided by GuarantCo and USAID.

Ruaha – small IPP/mini-grid case study

- Ruaha Energy is a Tanzanian private developer and **operator of rural and small urban electrification projects**, including village mini-grids (solar PV with biomass gasifiers), grid-tied solar PV, and small hydro plants.
- Ruaha has installed one 50-kWp mini-grid serving the village of Zombo and two nearby villages. Ruaha is developing several grid-connected projects, including two 1-MW solar PV plants and two small hydro plants (500 kW and 200 kW).
- Ruaha has raised **corporate equity** for the village mini-grids and on-grid projects, and secured grants for individual projects. In November 2016, it raised funds from a **U.S. equity private placement** and now is planning to raise more funds through debt and equity private placements or possibly equity crowdfunding.
- Ruaha has been awarded five **project grants for technical assistance and capex** and it is hopeful that it will secure additional grants soon.

Developer case study – JUMEME

- JUMEME is a developer of mini-grids in Tanzania majority owned by RP Global. Other shareholders include INENSUS, Terra Projects and St Augustine University.
- JUMEME has **12 active solar diesel hybrid mini-grids** on islands in Lake Victoria, Tanzania, serving close to 5,000 connections total. JUMEME currently has a further **15 mini-grids under development**, which will connect an additional 6,000 customers by Q2 2020.
- JUMEME has raised around **$16.5M** to fund its mini-grid projects, of which approx. **$5M equity** (including sale of strategic stake to RP Global) and $11.5M grants (ACP-EU Grant of $8M, Tanzania REA RBF of $2.4M, EEP $500k and SEFA $400k, among others).
- JUMEME has developed **KeyMaker Model** to improve processing of local resources.

Developer case study – PowerGen

- Founded in 2011, PowerGen Renewable Energy is a leading micro-utility company in Africa with over **40 mini-grids** and hundreds of off-grid, renewable energy systems installed across 7 countries in Sub-Saharan Africa. They have made over **50,000 connections** through mini-grids. Last year they took over the mini-grid business of **Rafiki / EON Offgrid Solutions.**
- They have publicly announced **$6.7M of financing** until year-end 2018, of which **$4.5M equity and $2.2M larger grants** (two from US Aid and one RBF from the GMG Facility Kenya). They have also received smaller grants from other sources.
- The Series A equity round was led by DOB Equity (Dutch family office), with other investors including AHL Venture Partners (impact venture capital), and private investors including two high net worth individuals*.
- PowerGen recently announced an **investment by Crossboundary Energy Access** in their Tanzanian projects (see next slide).

* Marc Beuls, former President and CEO of Millicom International Cellular and Billy Harbert, CEO of BLHarbert International

Fund case study – CBEA (1)

- CrossBoundary Energy Access (CBEA) is the **first blended project finance facility** for mini-grids in Africa
- CBEA is part of the CrossBoundary Group, a set of platforms focused on bringing private capital into underserved markets
- CBEA is initially investing $16 million into mini-grids providing grid-quality power to 170,000 people
- Funding came from Rockefeller Foundation and Ceniarth, while the set up costs were funded by UK aid and Shell Foundation

CROSSBOUNDARY

Powergen Tanzania*

- CBEA's first investment is an initial $5.5 million to finance 60 new pay-as-you-go rural mini-grids of Powergen, providing grid-quality power to 34,000 people in rural Tanzania
- CBEA has signed $3 million results-based long-term senior loan with REPP (see other case study)

*See links: https://repp.energy/project/powergen-tanzania/ and https://africa-energy-portal.org/news/cbea-lets-loose-first-55-million-60-minigrids-tanzania

Fund case study – CBEA (2)

CBEA overcomes challenge of financing small individual mini-grids and makes long-term financing easier for developers

CBEA's strategy is to **align its interests** with those of the developer

- CBEA sets up SPV to **purchase projects 100%** from developers **once operational**
- Very attractive for **developers** because they **can recycle cash** from operating projects to fund future growth
- CBEA pays developers a **development premium based on share of future profits** from the portfolio
- Make **developers responsible for long-term customer and asset management** services
- CBEA pays developers **operating fee with performance bonus** when mini-grid revenues exceed projections

*See links: https://repp.energy/project/powergen-tanzania/ and https://africa-energy-portal.org/news/cbea-lets-loose-first-55-million-60-minigrids-tanzania

Fund case study – REPP

- Renewable Energy Performance Platform (REPP) is **UK government-backed funding platform** managed by Camco Clean Energy, focused on helping renewable projects attract private and institutional investment

- Products
  - **Development capital** – loans for third party development expenses
  - **Gap financing** – bring projects to financial close using different financial instruments, **including results-based loans for mini-grid rollout**. Funds disbursed based on meeting results and performance indicators
  - Access to risk mitigation instruments
  - Access to long-term lending

Mini-grid investments*

- CBEA Powergen Tanzania – $3 million results-based senior loan (2019)
- Arc Power Rwanda – initial £600K convertible loan (2019)
- Virunga Power Corporate - $2.5 million convertible loan (2018)
- Powerhive Kenya – $3 million results-based loan with convertible option (2018)
- GVE Nigeria – $288K development capital (2016)

*See REPP (2019) in biography

Module recap

- Financing is a major challenge for mini-grids due to the lack of proven business models and the high level of risks, particularly in relation to electricity demand and policy and regulation.
- Mini-grids are still heavily reliant on grant and equity funding, although corporate/project lending is increasing.
- Financial support from the public sector remains critical. Examples include government tenders and support programmes and investment funds whose anchor investors include development financing institutions.
- Strategic investors from the utility, oil & gas and other sectors have invested in mini-grids, both directly and through funds.
- Innovative funding and de-risking structures have emerged including results-based financing, crowd funding, export credit and loan guarantees.
- Developers have adopted different funding models including the multi-utility model and the small IPP / mini-grid co-financing model
- For developers seeking funding, it is important to develop robust financial models that can be tested for different business scenarios. As with any financial model, it is important to identify the right inputs in order to generate realistic results.

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