

PAYGOing the last mile?

ESEF 2019
Accra, Ghana



DIFFER

Tom Erichsen

Differ develops and invests in technologies/companies that offer solutions addressing the energy needs of energy poor communities

- > Distributed/decentralized PV solar solutions
- > Innovative battery/storage solutions
- > Energy efficient appliances
- > Clean cooking solutions
- > DESCOS
- > PAYGO-solutions
- > (Turnkey) Projects

Bringing modern energy services to energy poor communities

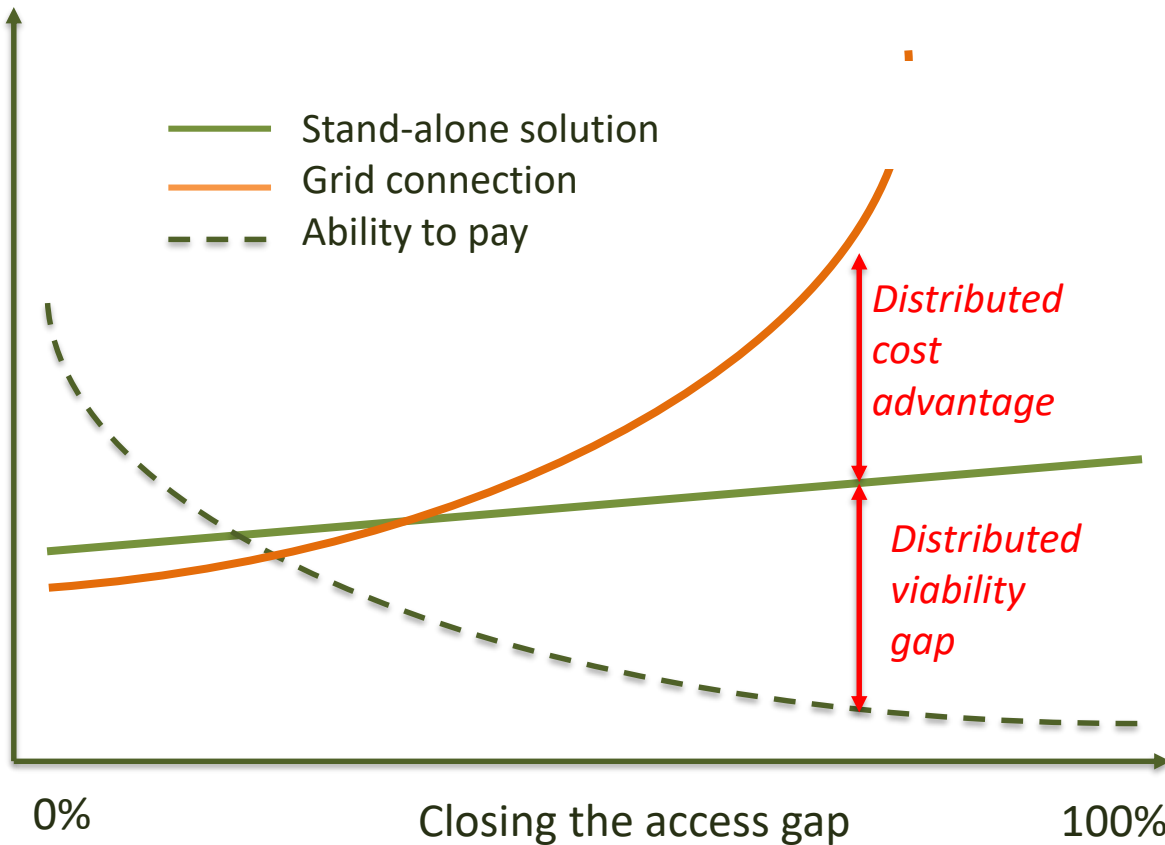
A green arrow pointing to the right.

Electrifying the last mile (SDG 7)

- > Differ Community Power
 - PAYGO solar for health

Most un-electrified villages should/will get access through distributed solutions

Tier 2 Cost; ATP



How large share of the gap is it commercially viable to serve?

With Tier 2+?

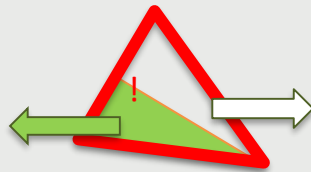
Will subsidized grid energy continue to take the most viable customers?

Barriers

Increased cost due to longer distances and lower density



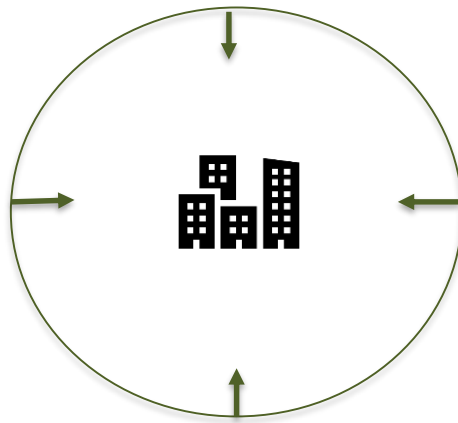
Risk and cost associated with customer quality



Limited access to working capital at attractive terms

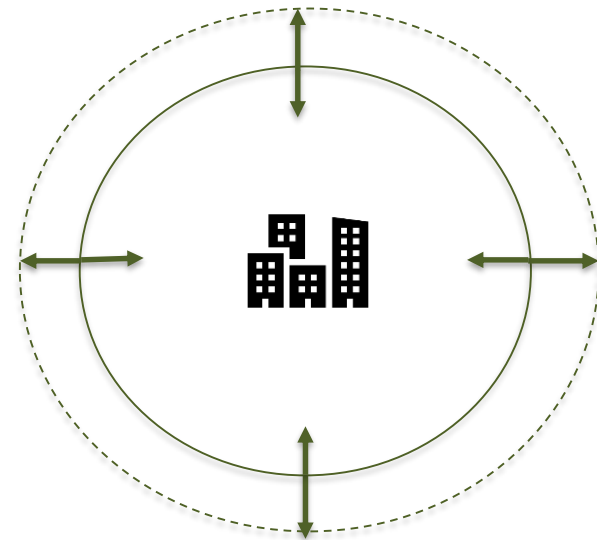


Consequence: Increasing introversion of growing PAYGO businesses



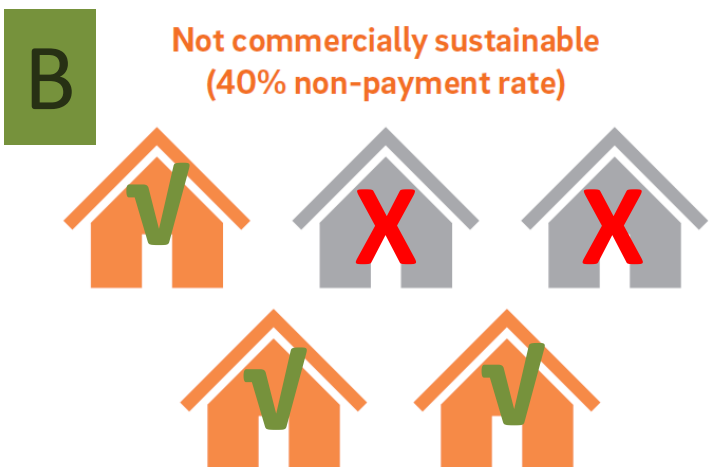
Introvert sales activities:

- > Smaller/larger systems in same area
- > New assets to existing customers
- > Moving existing customers up the ladder



- > How to enable SHS companies to also reach further from each of their current sales hubs, or to establish more hubs?
- > BUT without running companies into debt repayment issues

How to ensure that all viable customers get access?



- > **Uncertainty when targeting new under-served segments:**

Will the non-payment rate be 10% or 40%?

< 20% means success

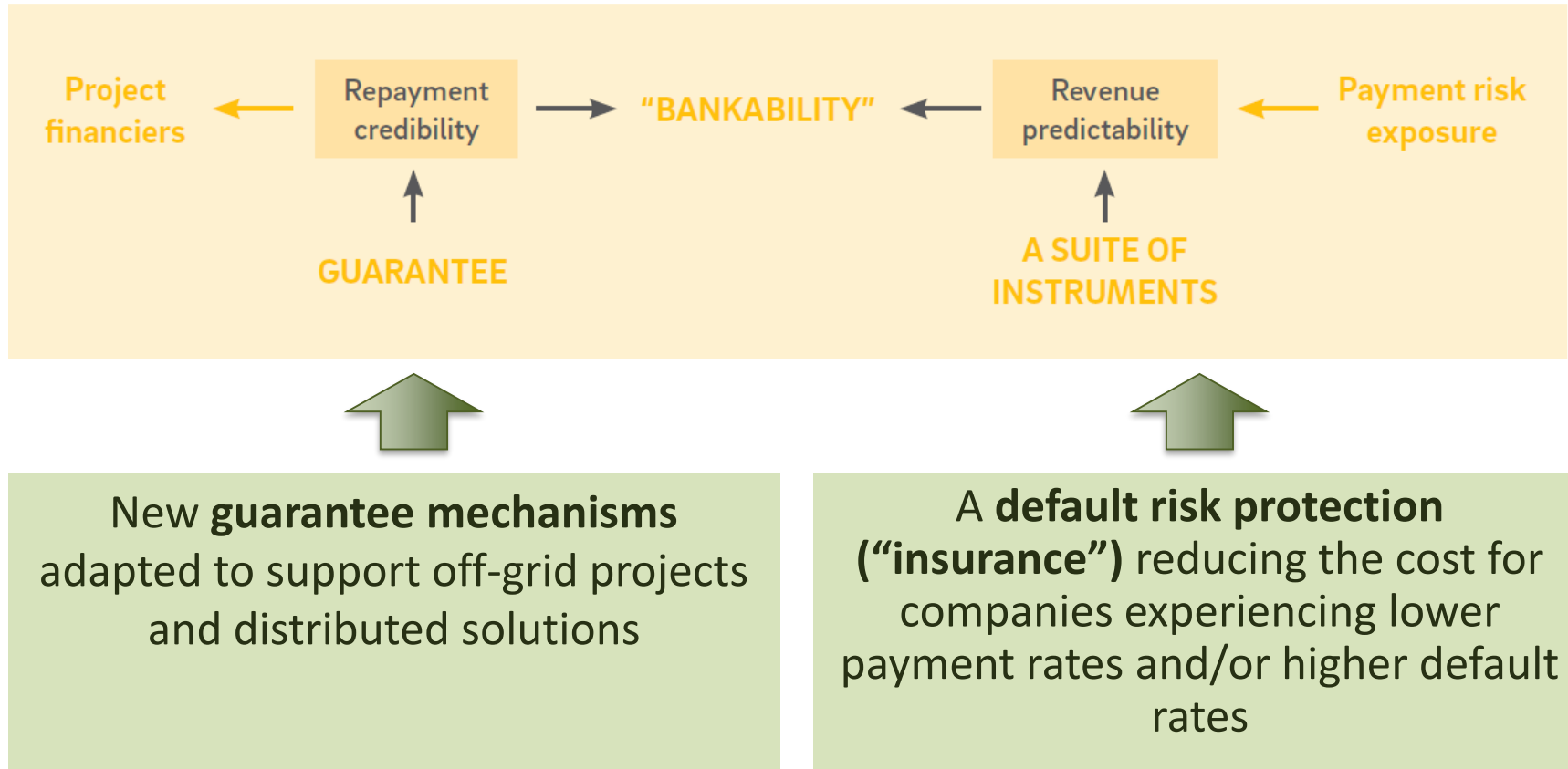
> 20% means unviable

- > **In case of 40% non-payment, how to effectively allow the private sector to serve the 60% that are paying?**

Achieving “bankability” for a larger share of the last mile customers requires new instruments



DESCOs need support on both sides of bankability



Report on distributed solar solutions:

<http://www.differgroup.com/analysis/p/Cheaper,-faster,-cleaner---speeding-up-distributed-solar-solutions-to-meet-development-and-climate-goals>

Cheaper, faster, cleaner

– Speeding up distributed solar solutions to meet development and climate goals



April 2019

 Differ
Sverige-Norge



ZERO



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 eco
INSIDE

 SOLAR
ENERGY
ELECTRICITY

> Electrifying the last mile (SDG 7)

-  Differ Community Power
 - PAYGO solar for health

Differ Community Power – delivering complete turn-key and PAYGO solutions for community services



Health facilities

- Lighting, TV, radio, computing, charging, air circulation and fridge
- Street and security lights
- Cold and clean water
- Hot water
- Air conditioning
- High-speed connectivity for tele medicine
- Basic medical equipment
 - Sterilizer for instruments (autoclave)
 - Suction pump
 - OP Lamp
 - Basic instruments
 - Microscope

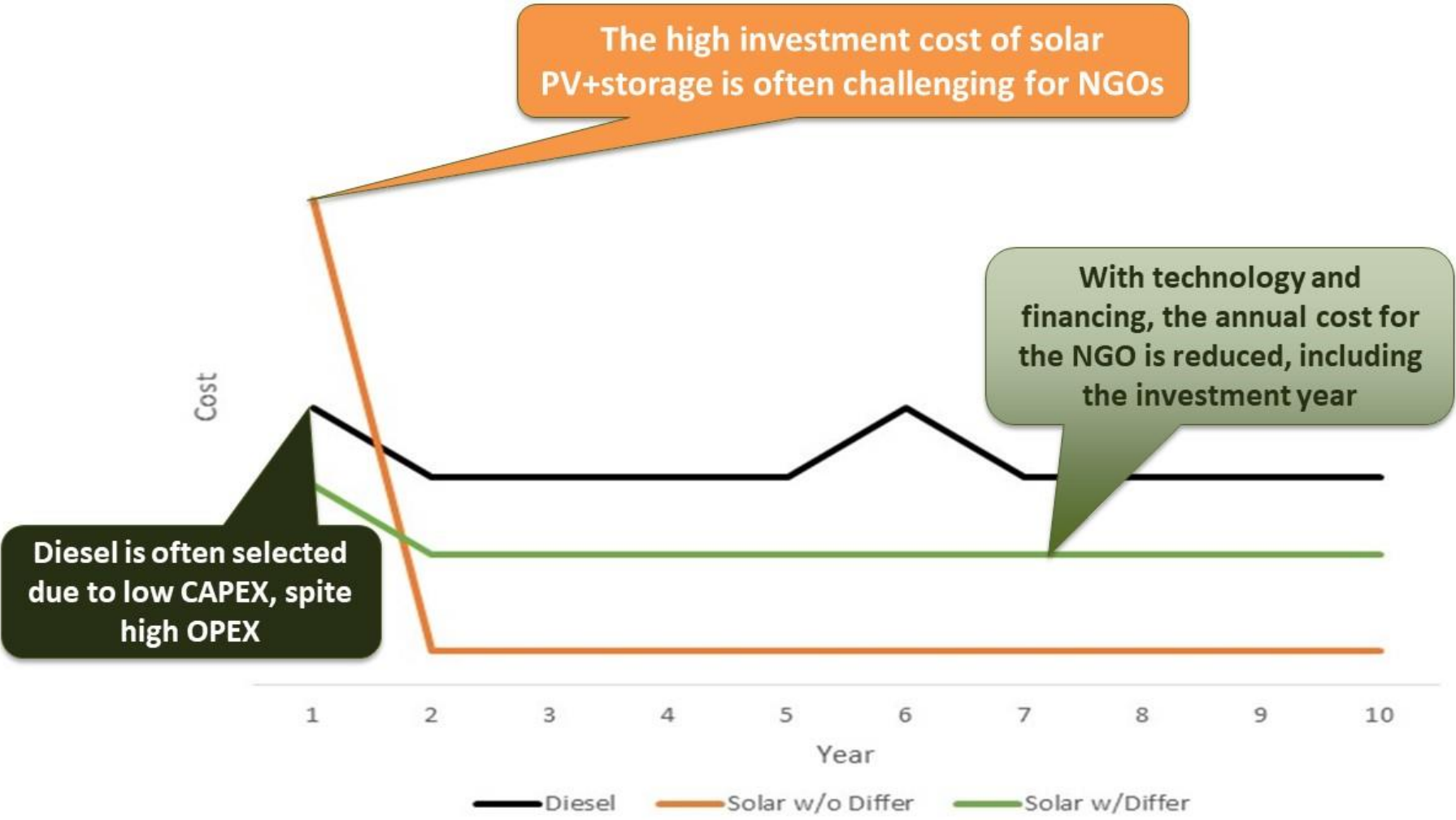
Schools

- Basic kit for class room, incl. lighting, charging and fans
- High speed connectivity
- Laptops & tablets & projector
- Security lights, water etc (as for health post)
- Training and education/contents

Community centers

- Basic appliance kit
- Clean cold and hot water
- Street and security lights
- Job training and contents
- Business space
- Other community centre facilities

PAYGO often necessary for solar to be preferred to diesel



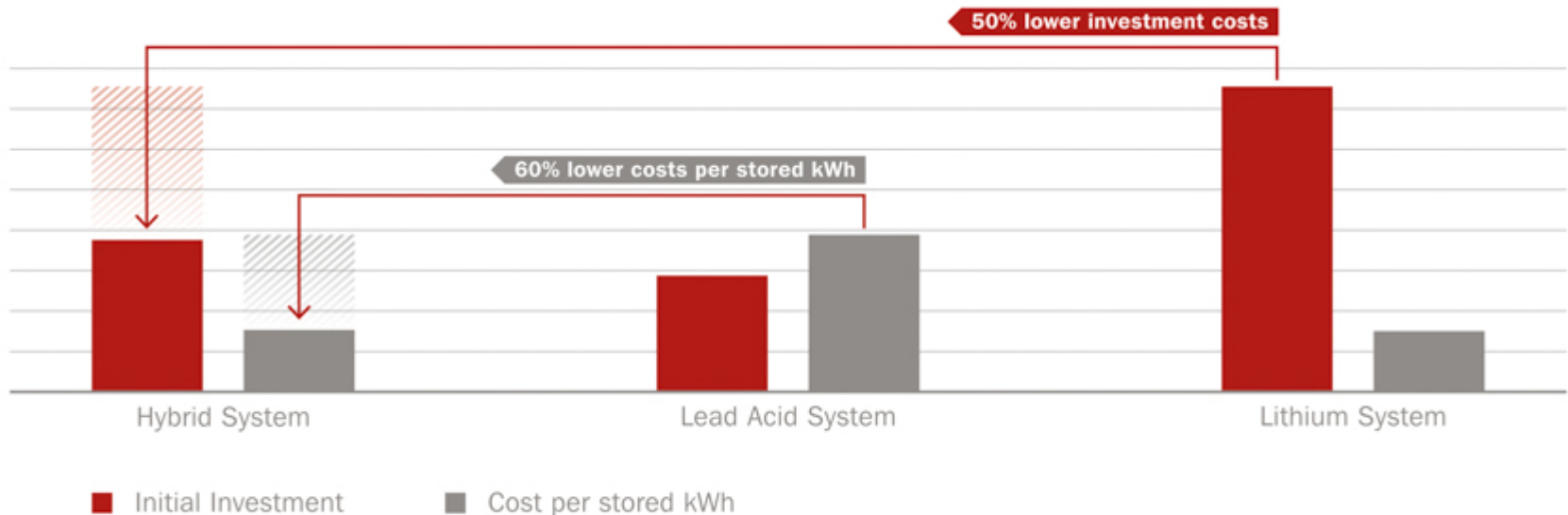
Li/LA Hybrid Battery: “LITHIUM PERFORMANCE AT LEAD ACID COSTS”



20-50% lower investment cost compared to pure lithium battery solutions
...but with much longer lifetime compared to lead acid
...and limited maintenance required



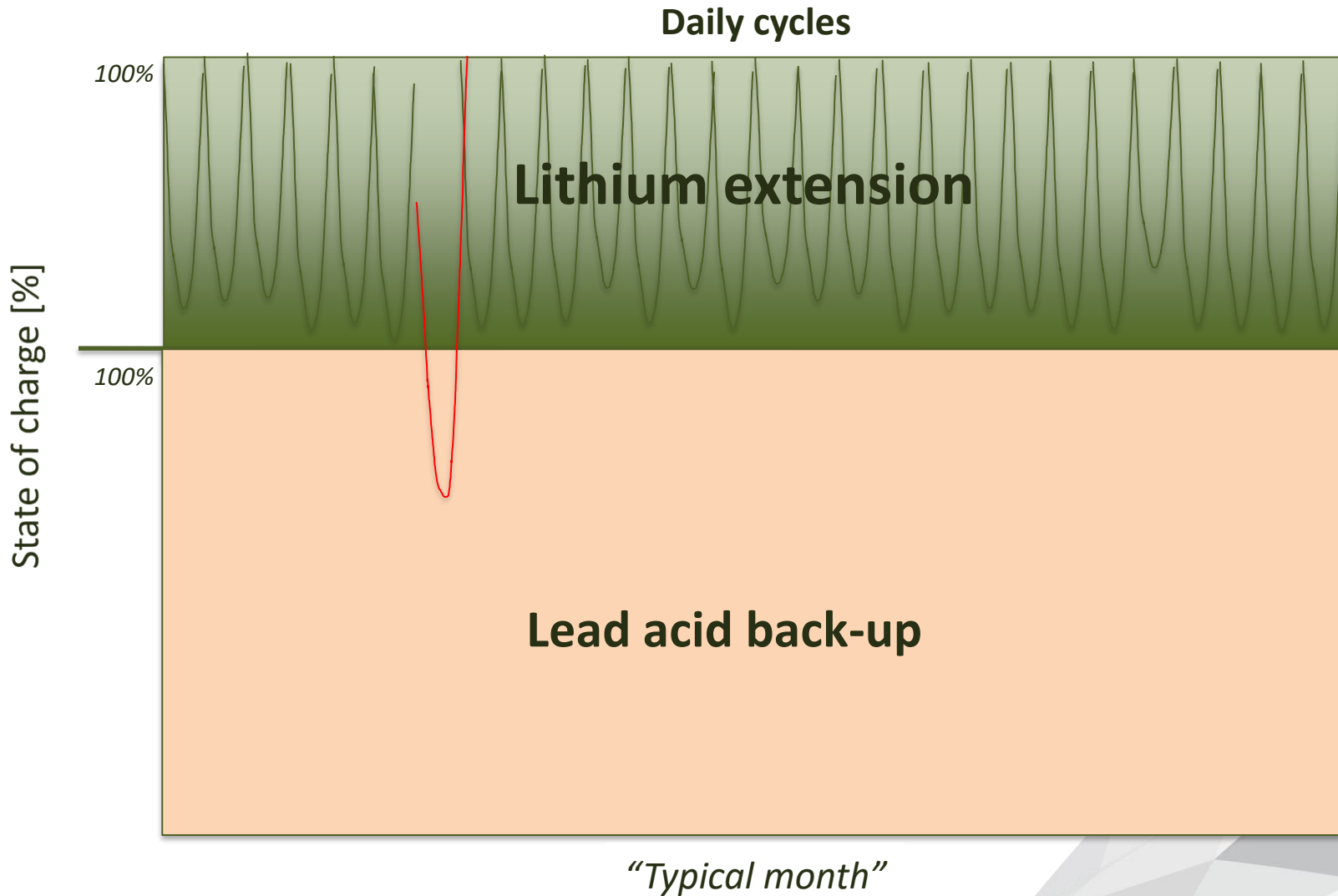
Lowest cost per stored kWh
PAYGO-attractive and optimal for health facilities



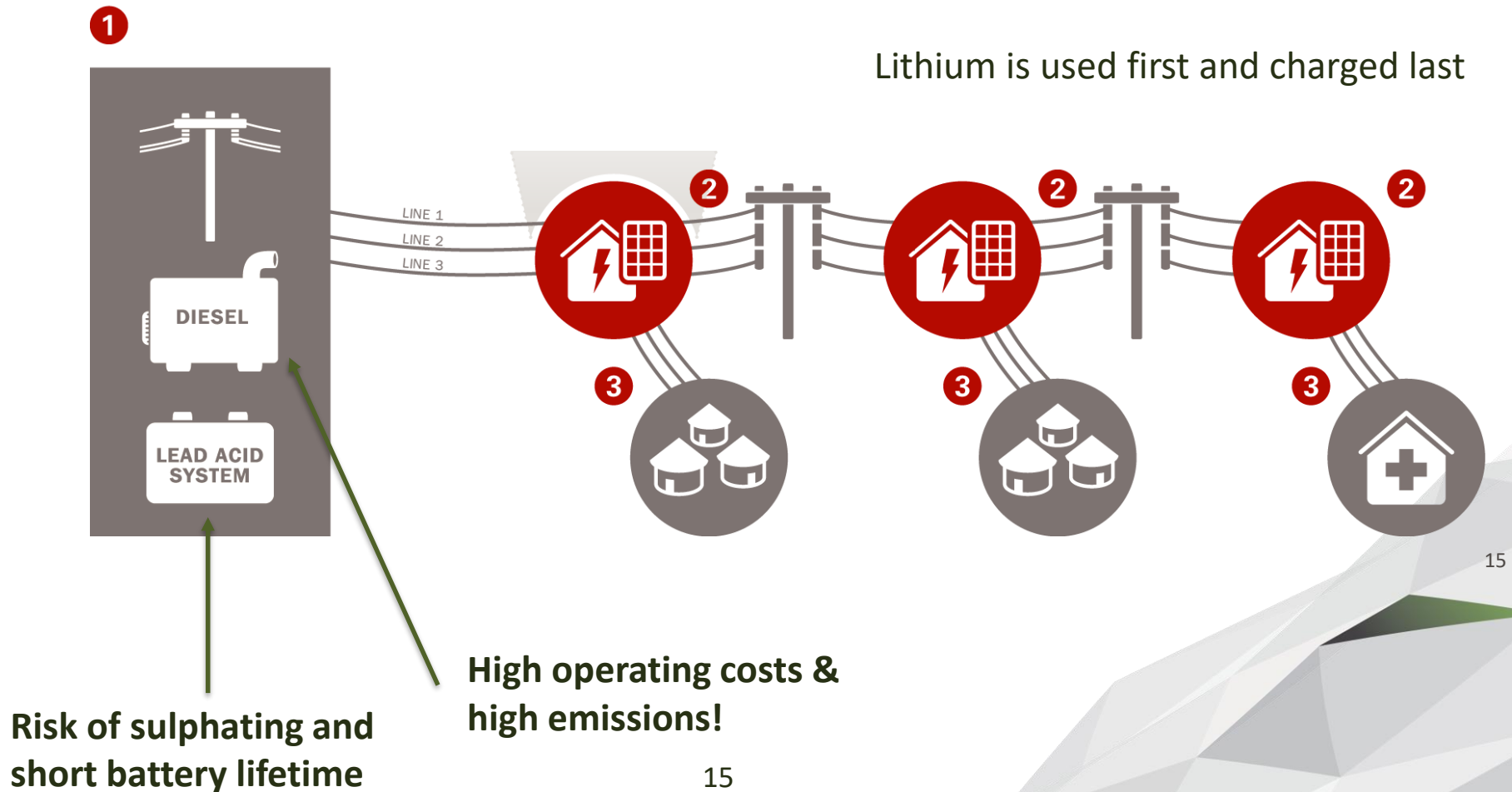
HOW?

Lithium extension for daily cycles; lead acid for back-up

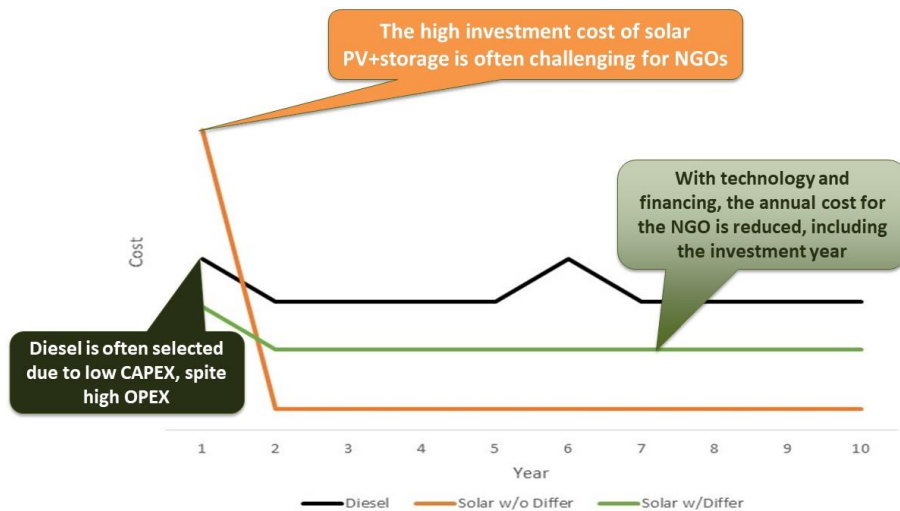
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Retrofitting: Solar+Lithium Extension as primary energy source, diesel/lead acid as backup



With PAYGO, a solar solution can offer savings from day one!



BUT....

- > Limitations in terms of longer-term commitments (annual/short budget periods)



Need for a guarantee to cover this risk

- > Tenders are usually not PAYGO-designed



- > **Revised tender approaches needed**

- > Key design features of sustainable tenders
 - **Specify energy services, not Watts** – balancing generation capacity and ENEF
 - **Tender energy as a service, not a product** – improving performance and sustainability through payments over time (e.g. 5 yrs)
(more than just warranties or a limited payment for after-sale service/O&M)

- > **Focuses competition on cost effectiveness, not lowest cost alone**
 - Optimal balance of **cost vs durability** of system components
 - Optimal balance of **cost vs service level** in after-sale-service/O&M

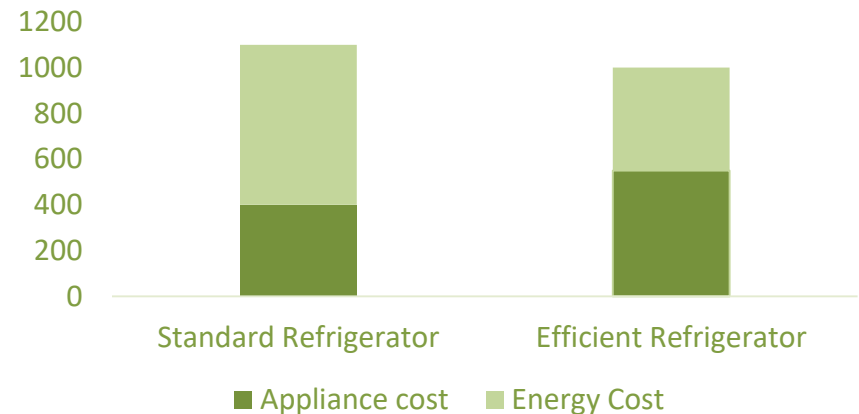
- > Benefits to tendering entity:
 - **Sustainability:** More systems functioning over time
 - **Savings:** No/lower payment for systems not working/under-performing
 - **Innovation:** Investing in smart solutions becomes more interesting

ENEF – investing in efficiency generally pays off

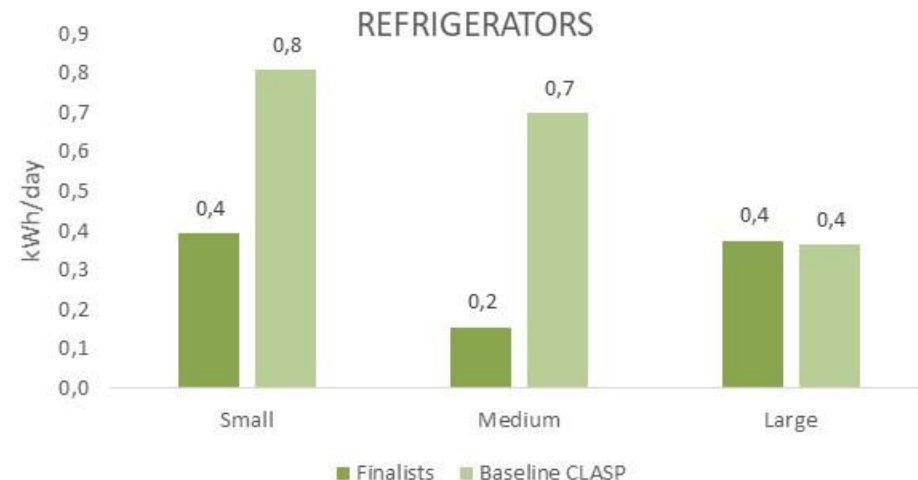


- > On system level, investing in efficiency generally pays off
- > Example for fridges off-grid:
 - Cost of fridge is 50-70% of cost of appropriate PV+battery
 - Depending on lithium or lead acid
- > Efficiencies vary greatly, but..
- > ...cost of appliances is not fully correlated to efficiency
 - Super-efficient comes at a premium
- > ***Super-efficient equipment can also be leased***

Cost of appliance and energy



Energy consumption: Finalists vs CLASP baseline



Differ Distributed Energy Fund

A new Norwegian fund investing in distributed energy growth companies



ABOUT DIFFER DISTRIBUTED ENERGY FUND

WHY

- The market for distributed energy solutions is expected to show enormous growth over the coming decade
- Distributed energy solutions are often faster, cleaner and more cost-efficient than grid-based alternatives
- Distributed energy is a global megatrend delivering permanent & reliable solutions in developed and developing countries
- Scaling distributed and off-grid energy solutions is key to achieve both development (SDG7) and climate (Paris) goals

It is more cost effective to distribute PV panels than kilowatt-hours

WHAT

- Investments in companies and projects along the value chain for distributed renewable energy solutions
- Companies and solutions with international market aspirations, specifically in off-grid, mini-grid and captive markets in Africa and Asia.
- Primarily targeting the solar market segment
- Targeting technology suppliers, systems integrators, project developers & EPCs, distributors/DESCOs, suppliers of energy efficient products and services, companies with digitalisation strategies & innovative business models within the distributed energy space
- Unlisted growth companies in the commercialisation/scale-up phase
- Investments shall contribute to reduced emissions of GHGs

HOW

- Capital pr investment: ~€1-4m for 10-40% shareholding
- Equity and other instruments
- Active ownership - board position
- Investment horizon: ~3 - 6 years
- Capitalisation target: €30m
- Target closing: Fall 2019

WHO

- Norwegian fund established by Differ Group (www.differgroup.com)
- Differ Group is a Norwegian investment company with 20+ years of experience in the distributed energy space
- Experienced investor with proven distributed energy track-record
- On-the-ground experience from managing and advising renewable energy companies in Asia and Africa

DIFFER DISTRIBUTED ENERGY FUND IS CURRENTLY SEEKING INVESTORS AND INVESTEES - CONTACT:

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