



Off-grid and mini-grid market trends and opportunities in the world and SEA

AESW 2020, Preparation webinar

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What is GIZ?

Supported by:



Federal Ministry
for the Environment, Nature Conservation
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based on a decision of the German Bundestag

- Owned by the **Federal Republic of Germany**
- Operations in Germany and over **120 countries** around the world
- In Thailand focuses on different topics such as climate change mitigation and adaptation or Energy transition
- Two main energy projects in Thailand: **TGCP E and CASE**
- Sustainable energy and in particular energy access is one of the most important fields of work of GIZ globally

What is electricity access?

Multi-tier frameworks to measure access to household electricity supply

	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	
1. Peak capacity	<3W (<12Wh)	Min 3W (Min 12Wh)	Min 50W (Min 200Wh)	Min 200W (Min 1kWh)	Min 800W (Min 3.4kWh)	Min 2kW (Min 8.2kWh)	
2. Availability (hours per day/evening)	<4hrs/1hr	Min 4hrs/1hr	Min 4hrs/2hrs	Min 8hrs/3hrs	Min 16hrs/4hrs	Min 23hrs/4hrs	
3. Reliability	More than 14 disruptions per week			At most 14 disruptions per week, at most 3 disruptions per week with total duration of 2hrs+	Max 14 disruptions per week	Max 3 disruptions/week of total duration <2 hrs	
Electricity supply							
4. Quality	Household experiences voltage problems that damage appliances				Voltage problems do not affect the use of desired appliances		
5. Affordability	Cost of a standard consumption package of 365 kWh/year is more than 5% of household income			Cost of a standard consumption package of 365 kWh/year < 5% of household income			
6. Legality	No bill payments made for the use of electricity				Bill is paid to the utility, prepaid card seller, or authorized representative		
7. Health & safety	Serious or fatal accidents due to electricity connection				Absence of past accidents and perception of high risk in the future		
Electricity services		Task lighting and phone charging	General lighting, phone charging, television and fan (if needed)	Tier 2 and any medium-power appliances	Tier 3 and any high-power appliances	Tier 4 and any very high-power appliances	
Electricity consumption	Daily consumption	<12Wh	12Wh+	200Wh+	1,000Wh+	3,425Wh+	8,219Wh+

Source: SE4ALL

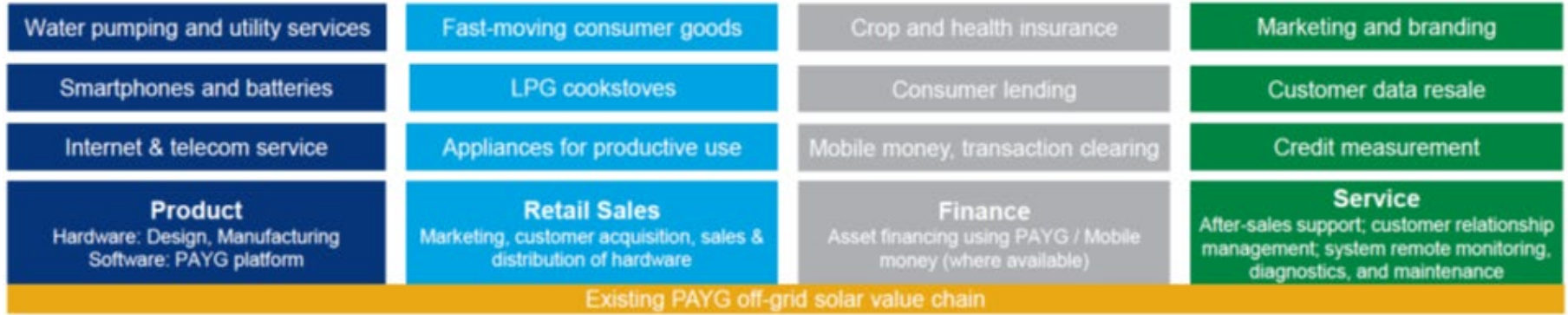
What is electricity access?

Off grid and unreliable electricity access needs (in millions of households)



Source: GOGLA

New energy models: Beyond basic electricity connection



Source:

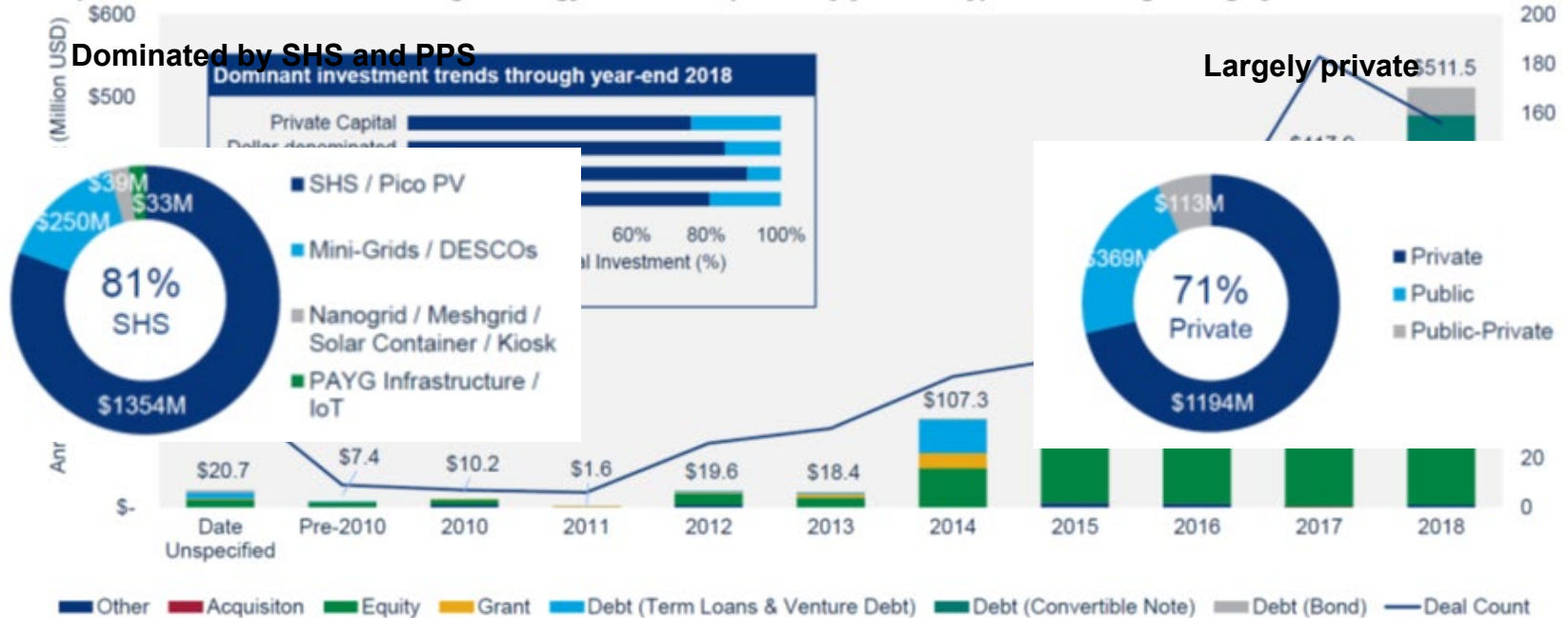
Wood Mackenzie Power & Renewables in partnership with



- Off grid access is becoming a platform for access to other good and services. It is based on partnership between companies offering diverse services and products.
- Such services allow to increase average revenue per users, continuous engagement as well as to gather more data regarding consumption pattern and credit risks
- Value stacking has been central in the value chain growth and in attracting investment

Investments trends in the off-grid sector worldwide

Corporate-level investment into off-grid energy access companies by year and type of financing through year-end 2018



Source: Wood Mackenzie Power & Renewables, Ener4 Impact

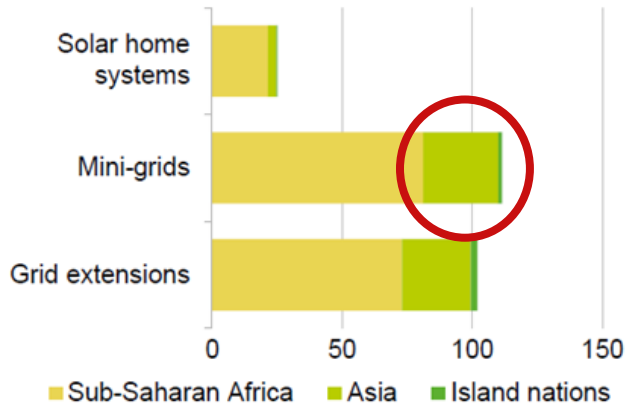
Source:

Wood Mackenzie Power & Renewables in partnership with ENERGY4IMPACT
ACCELERATING ACCESS TO ENERGY

Market outlook per region and technology

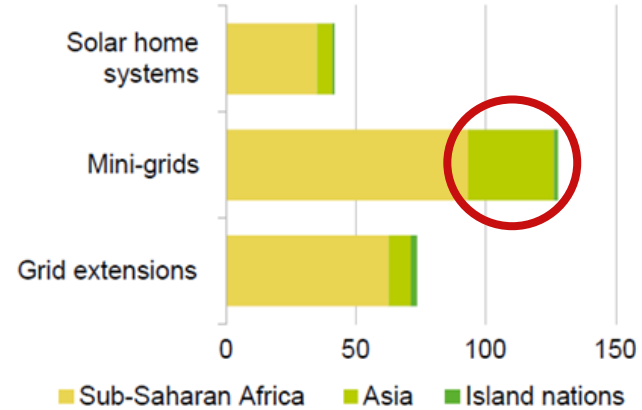
Technology use in universal access scenario

Households reached (million)



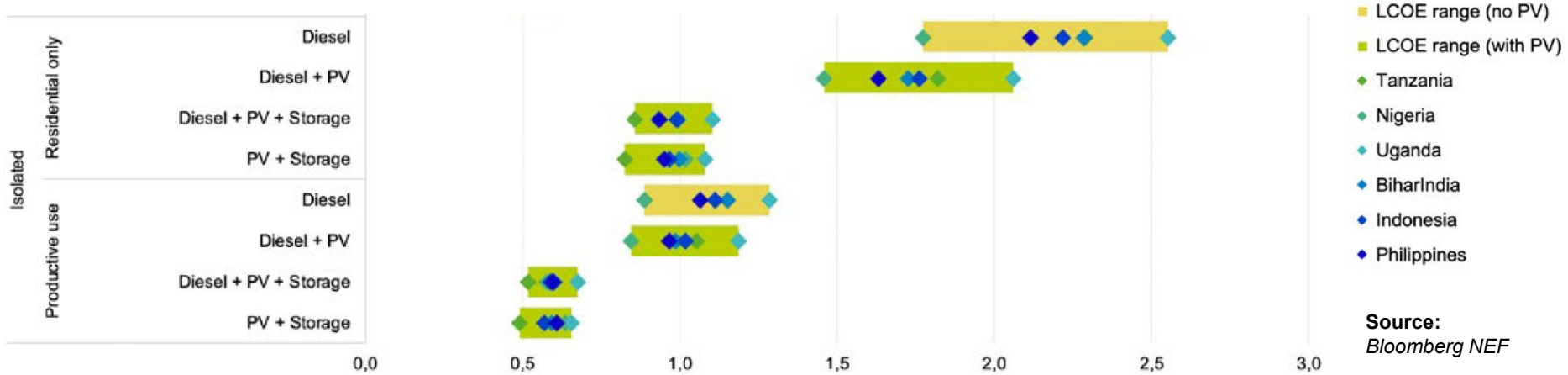
Capital expenditure in universal access scenario

Capital expenditure (\$ billion)



Source: Bloomberg NEF

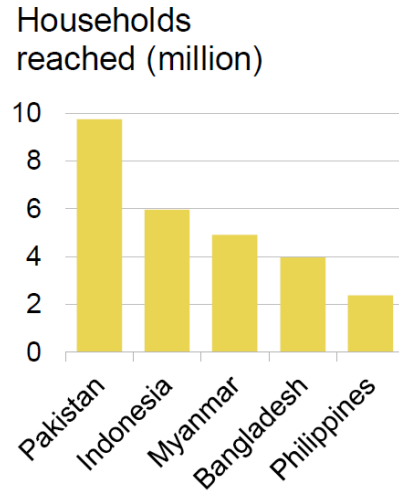
Why are mini-grids are suitable solutions for SEA?



- Remote islands situations are common in SEA. Unlike in Africa, many of those places already consume and use electricity usually with Diesel making them ideal business case for RE MG
- SEA island situations also benefit from more favorable conditions such as the presence of anchor loads (telecom towers, public services, businesses etc.) making a better business cases for MG

Why are mini-grids are suitable solutions for SEA?

Top five Asian countries by potential market size for mini-grids



Source: Bloomberg NEF

On top of those markets, MG solutions are adapted to cover last mile electrification in most other SEA and pacific countries with high number of islands or very remote places such as Thailand, Malaysia, Pacific etc.

Who funds mini-grids in SEA? Examples from PHL and IDN

Mini grid investment landscape: Philippines

Financier



Ministry of Trade,
Industry and Energy



ASIAN DEVELOPMENT BANK

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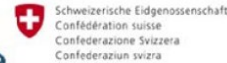
TEPCO Power Grid

Mini grid investment landscape: Indonesia

Financier



WORLD BANK



Swiss Agency for Development
and Cooperation SDC



from the British people



Ministry of Foreign Affairs of the
Netherlands



NORWEGIAN MINISTRY
OF FOREIGN AFFAIRS

Key challenges and way forward

- Market awareness: learn from others
- Community and policy awareness
- Regulatory framework: supporting self sustained business and investment models
- Think access at large and long-term development
- Technological innovation and transfer
- Skills development from both companies and users' side

Join us on 25 September (ASEW 2020) to deep dive into the experience of GIZ and others in Thailand and SEA and learn more about how to capitalize on the business opportunities offered by off-grid and mini-grid renewables to reach 100% sustainable electricity access in SEA.

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