

Webinar on “Mobilizing International and Regional Finances/Funding for Implementation of Renewable Energy Projects in SAARC Member States” 11, Feb., 2020



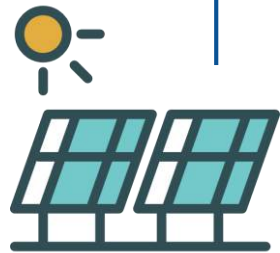
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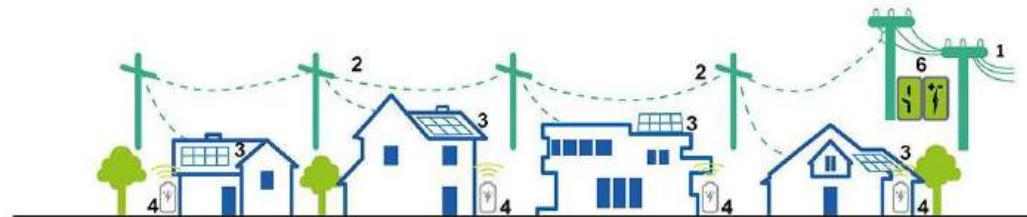
Financial Incentives & Mechanisms to Encourage Private Investment In Renewable Energy Sector



Renewable Energy Market Financing



Grid Off Take



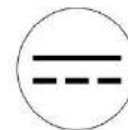
Distributed Generation/Community Power



Household



Alternating Current (AC)



Direct Current (DC)



Prevalent Worldwide



Mostly Africa



Household Solutions
(Grid Quality Access)



Household
Products

Types of Financing in Renewable Energy



Equity Finance



Project Development Capital



Debt Finance



**Off-balance sheet
project financing**



**Corporate finance
(small projects; less than \$15 million)**



**On-balance sheet
corporate finance**

The Range Of Financial Instruments

Financial Instrument Addresses :			
	Financing Barriers	Both Barriers & Risks	Project Risks
Project/Programme Financing			
Grants	-	-	Capital Grants
Equity	Equity (Venture Capital)	-	-
Debt	Senior Debt (Credit Line)	Subordinated Debt	Senior Debt (Project Loan)
Asset-Backed	Asset-Backed Securities	-	-
Guarantees & Insurance	Liquidity Guarantee	Pari-Passu/Subordinated Guarantees	Political Risk Insurance/Partial Risk Guarantee
		Wind/Solar Insurance	
		Contingent Resource Insurance	
Targeted Instruments			
Result-Based Financing	-	Contingent Project Development Grants	OBA/OBD/AMC/PES
Carbon Financing	-	-	Carbon Delivery Guarantees
			Advance Sales of CERs
Small-Scale Project Financing	Microfinancing for Customers	Portfolio Guarantees/Loss Reserves	-
	Aggregation		

Increasing Leverage
Increasing Risk

World Bank, 2012



Financing and associated risks taken....

Type:	Venture Capital	Private Equity	Infrastructure Funds	Pension Funds	Bank Mezzanine Debt	Bank Senior Debt
<u>Risk Taken:</u>	Start ups, new technology, prototypes	Pre IPO Companies, demonstrator technology	Proven technology, private companies	Proven technology	Demonstrator/ proven technology, new companies	Proven technology, established companies
<u>Approximate level of return, or margin</u>	>50% IRR	35% IRR	15% IRR	15% IRR	LIBOR + 700bps	LIBOR + 300 bps

Grid Offtake Projects



Grid Offtake Projects

Traditional Off taker
Utilities Serving Retail
Load

Driver: Compliance
Off taker: Integrated utilities
and large retail electric
providers

Other Common Off taker
Power Marketers

Driver: Profit
Off taker: Bank affiliated trading shops —
Bank of America Merrill Lynch — Citigroup
Energy — Morgan Stanley Commodities
Group

New Market Entrant
Corporate Purchasers

Driver: Sustainability — Demonstrate commitment to the
environment —
RE100: global initiative of influential businesses to go “100%
renewable”
Off taker: includes Microsoft, Google, Starbucks, Nike,
Nestle, Goldman Sachs, Bloomberg, Credit Agricole, UBS

New Market Entrant Risk Solution Providers
Driver: Profit

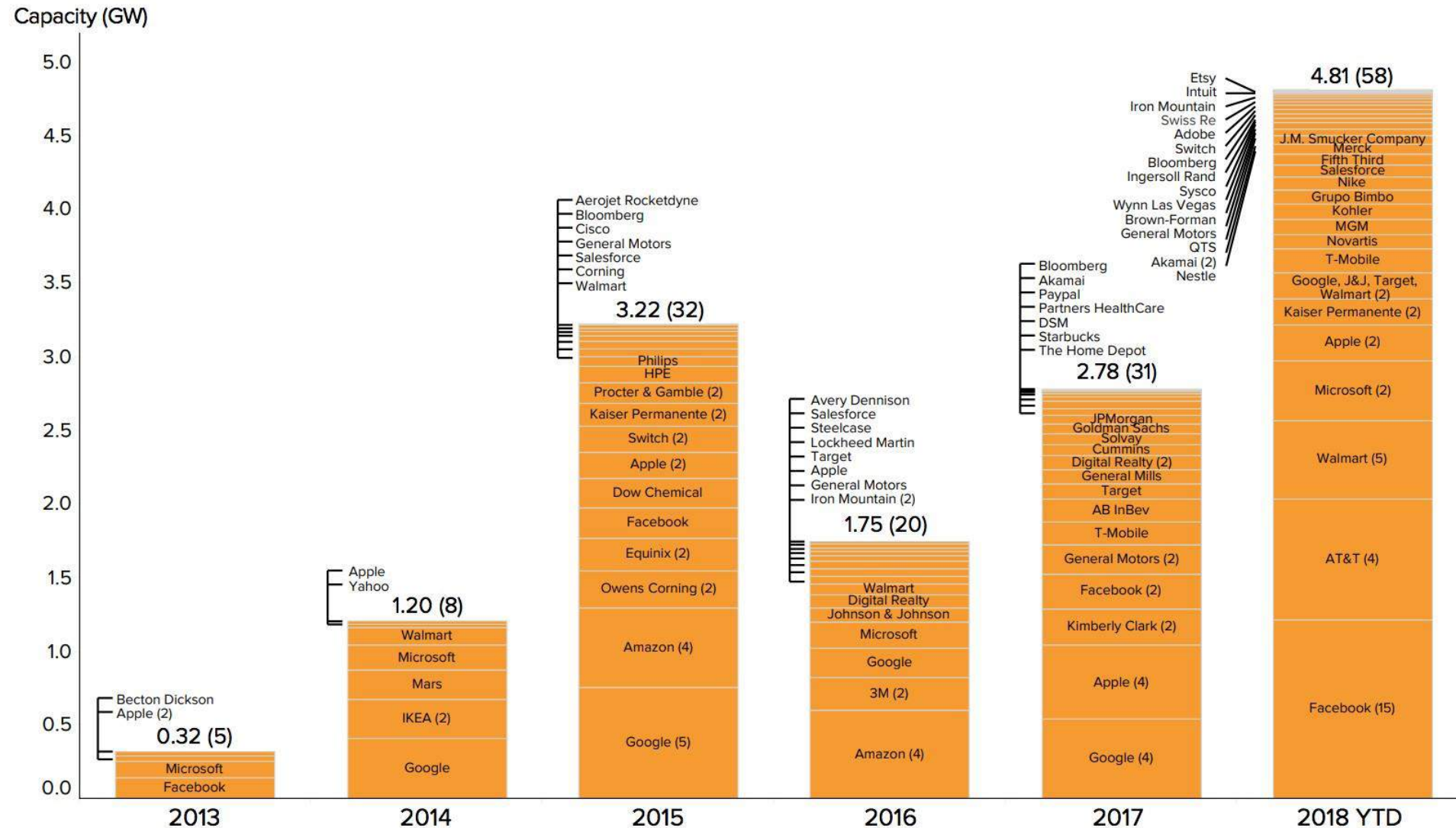


Off-Take Structures

- **Traditional Power Purchase Agreement**
- **Synthetic Power Purchase Agreement**
- **Hedge (Physical and Financial)**
- **Other Structures and Trends**

Overview of Corporate Power Purchase Agreements in the US (2013 – 2018)

Driver: sustainability – demonstrate commitment to the environment



REBA

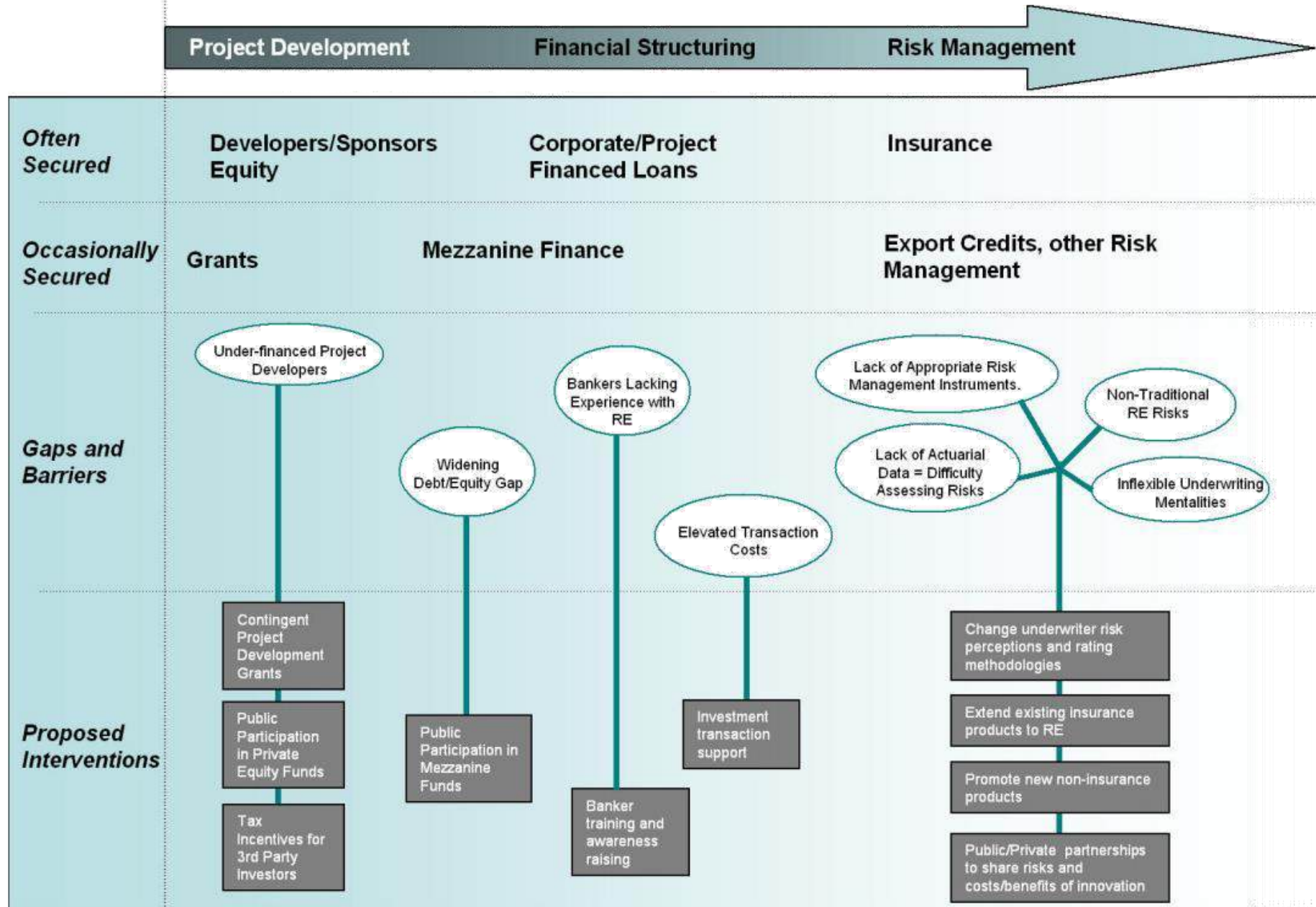
As of October 16, 2018. Publicly announced contracted capacity of corporate Power Purchase Agreements, Green Power Purchases, Green Tariffs, and Outright Project Ownership in the US, 2013 – 2018 YTD. Excludes on-site generation (e.g., rooftop solar PV) and deals with operating plants. (#) indicates number of deals each year by individual companies.

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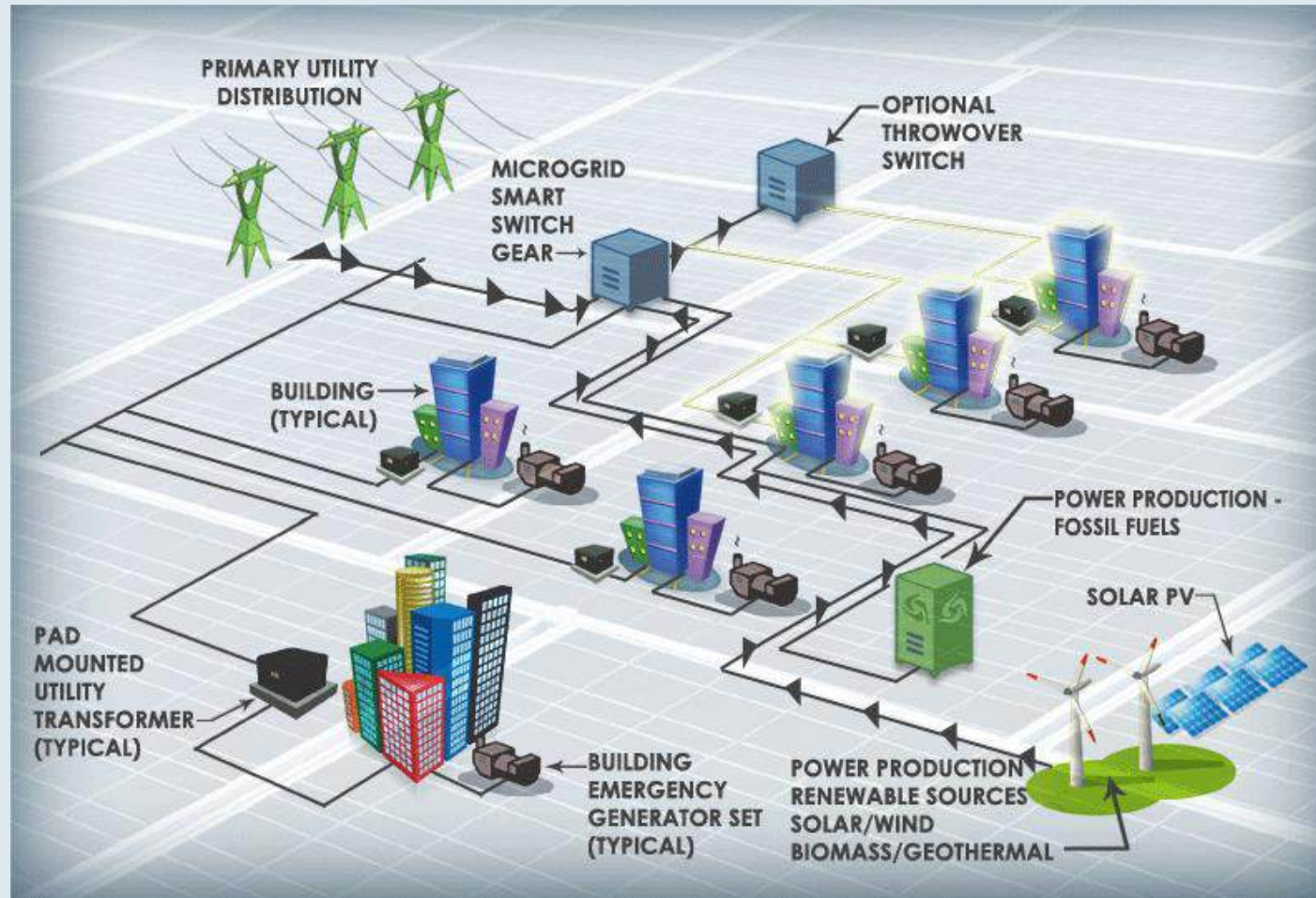


#REBA18

The On-Grid Finance Continuum



Distributed Generation



Mini-grid Business Model Components..



Demand Management



Promoting Income-Generating End Uses



Quality of Electricity Service



Tariff Design



Revenue Collection



End User Finance

Securing financing for mini-grid development is challenging, partly because of the inherent weaknesses of mini-grid financial models and partly because of risk perceptions

Current Distributed Generation Financing...



Grants and Subsidies

- ✓ International development agencies
- ✓ Local government agencies
- ✓ Trusts and foundations, Private individuals and others.



Equity Investors

- ✓ Early stage seed capital
- ✓ Expansion capital
- ✓ Impact investors
- ✓ Development financing institutions (DFIs)



Loans

- ✓ DFIs – Short term/concessional loan providers
- ✓ Commercial banks - only in case of proven business models mitigated project risks.
- ✓ International lenders – usually concerned about foreign exchange risks



Guarantees

- ✓ Loan guarantees
- ✓ Risk guarantees



Foreign Exchange Risk

Case Study: Sub Saharan Africa

Capital Cost: hard Currency
Revenues: local currency

Institutional equity: the yieldco model

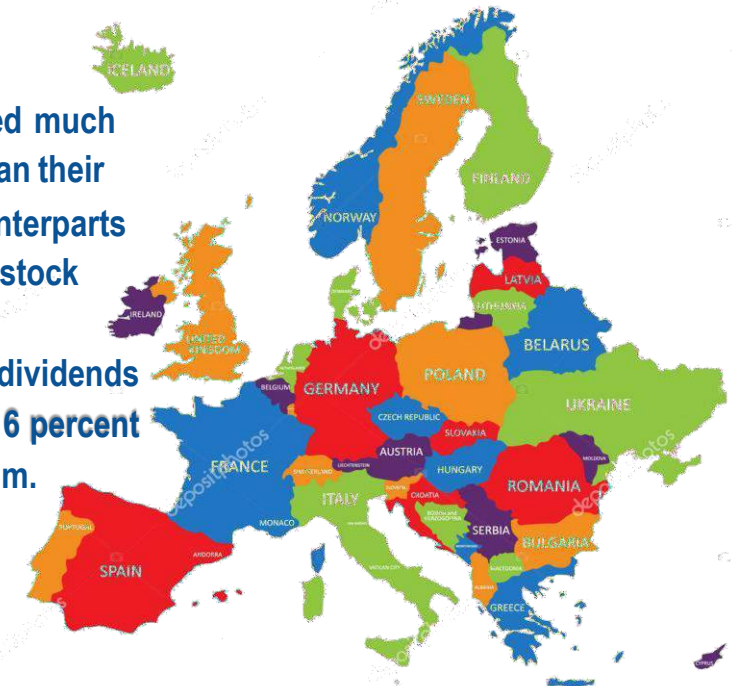
A yieldco is a dividend-paying company created for the long-term ownership of assets.

The American Experience:



The European Experience:

- ✓ performed much better than their U.S. counterparts
- ✓ minimal stock growth
- ✓ reliable dividends of about 6 percent per annum.



Restructuring In The Yieldco Space:

Improvements required to the corporate governance structure, project valuation methods, and "end game" strategy of YieldCos

Institutional debt: \$1 billion-plus in solar securitizations

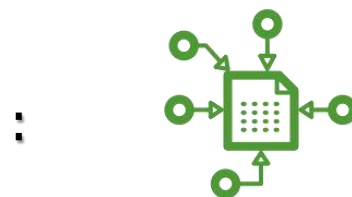
ASSET-BACKED SECURITIZATION (ABS)/ INSTITUTIONAL BOND OFFERINGS:

ASSET-BACKED SECURITY ABS



In a securitization, the issuer creates a large enough pool of similar assets such that no single asset should affect debt repayment. Investors purchase bonds or notes that are repaid through the cash flows of the underlying assets.

CHALLENGES



Collection, organization &
communication of data



Achieving sufficient
scale



Standardizing the
underwriting process

Green Bonds

Drivers for issuing Green Bonds...

Attract environmentally-conscious investor

Growing investor demand for green/sustainable financial instruments.

Stakeholder demand for responsible business practices are growing

Help project the company environmental-conscious organization thereby enhancing the brand

Almost all green bonds issued in past have been oversubscribed

competition from lending agencies that have issued green bonds

Accessible and powerful instrument for financing a sustainable low carbon economy.

Economical and convenient financial model by product developers



✓ Debt instrument

✓ Offers fixed return

✓ European Investment Bank (EIB) First issuer of Green bond

AC Energy
An Ayala Company
\$410m USD

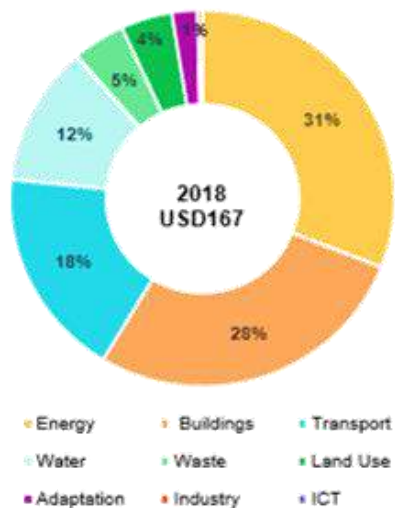
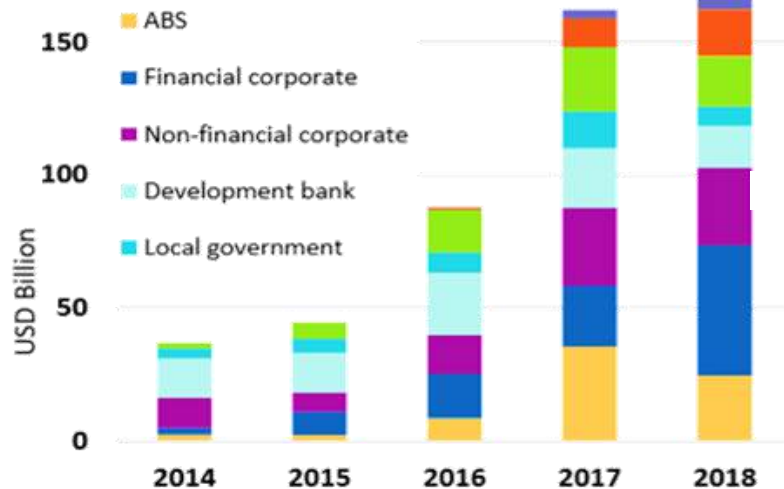
MidAmerican
ENERGY

Alliant Energy

Dominion Energy
(\$362 million)

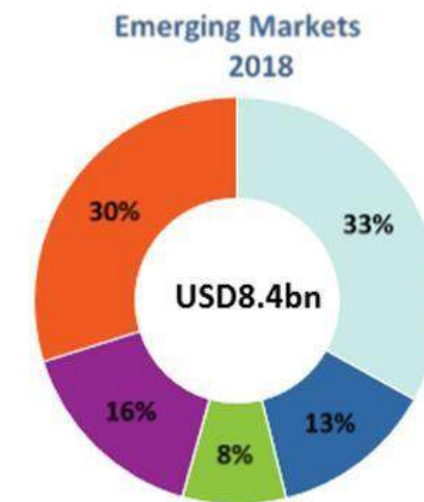
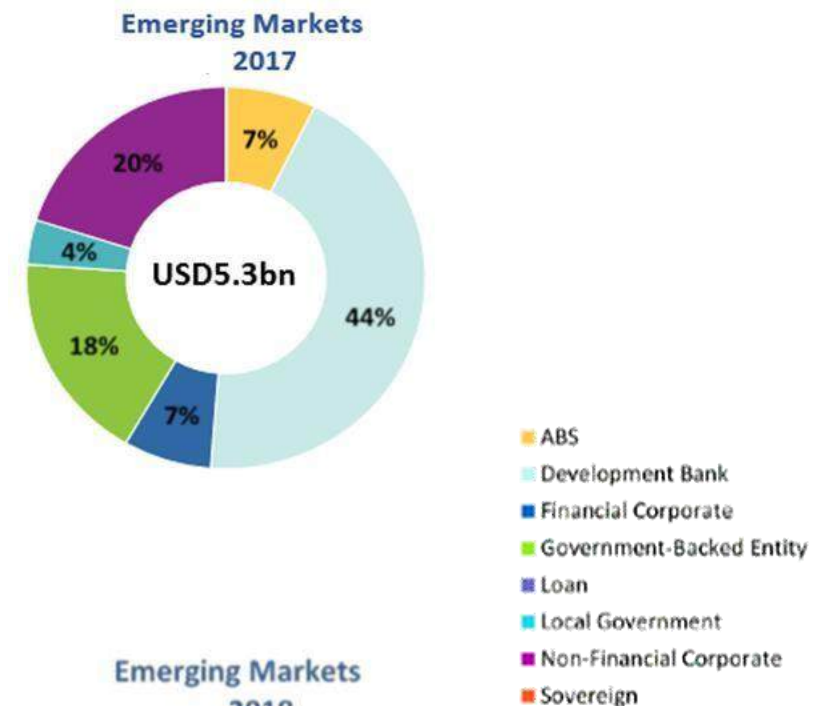
Navarre government (EUR 50 million (USD 56.7m))

Green Bond – Investors Demand

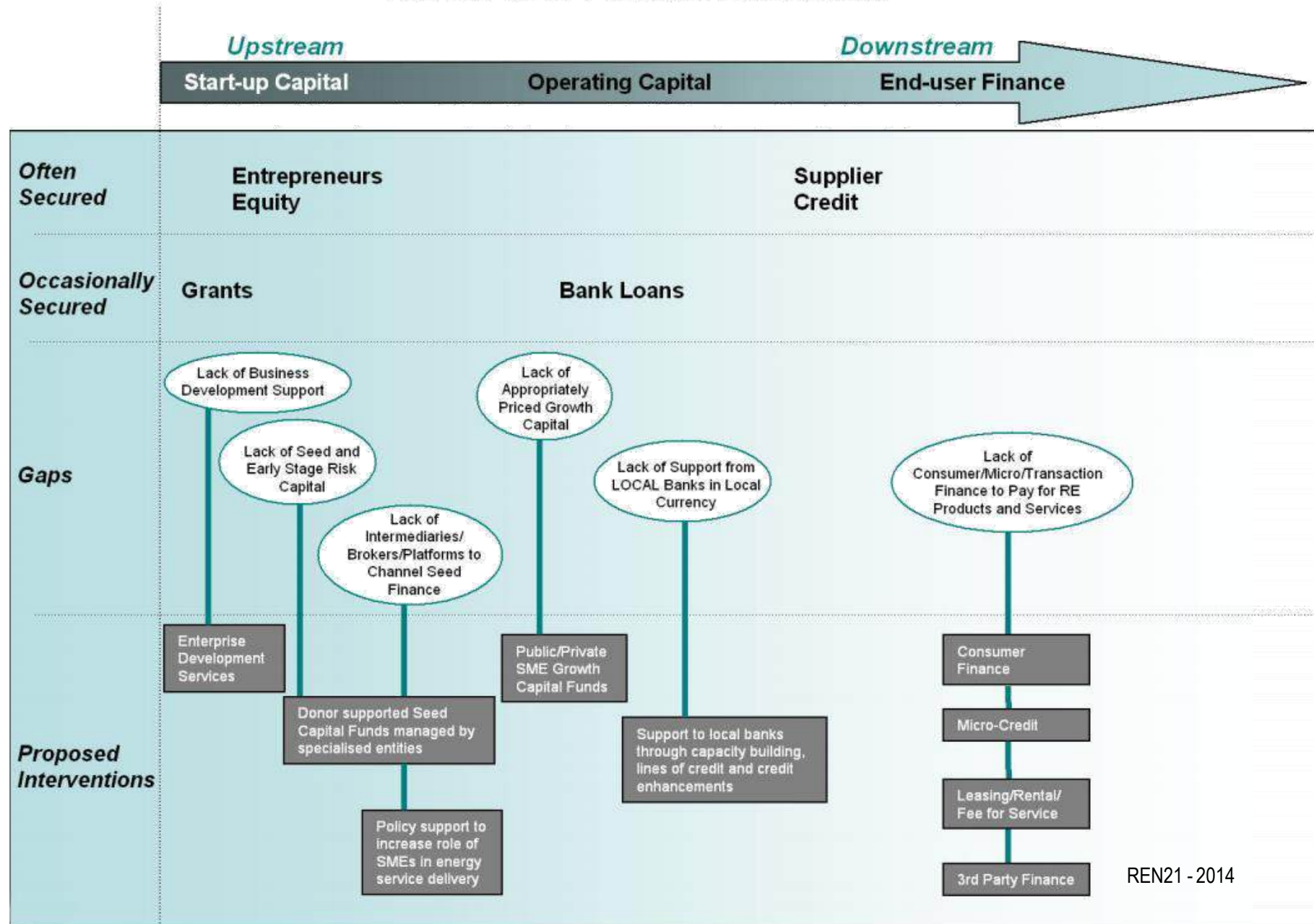


Use of green bond proceeds - 2018

Supply of Green Bonds



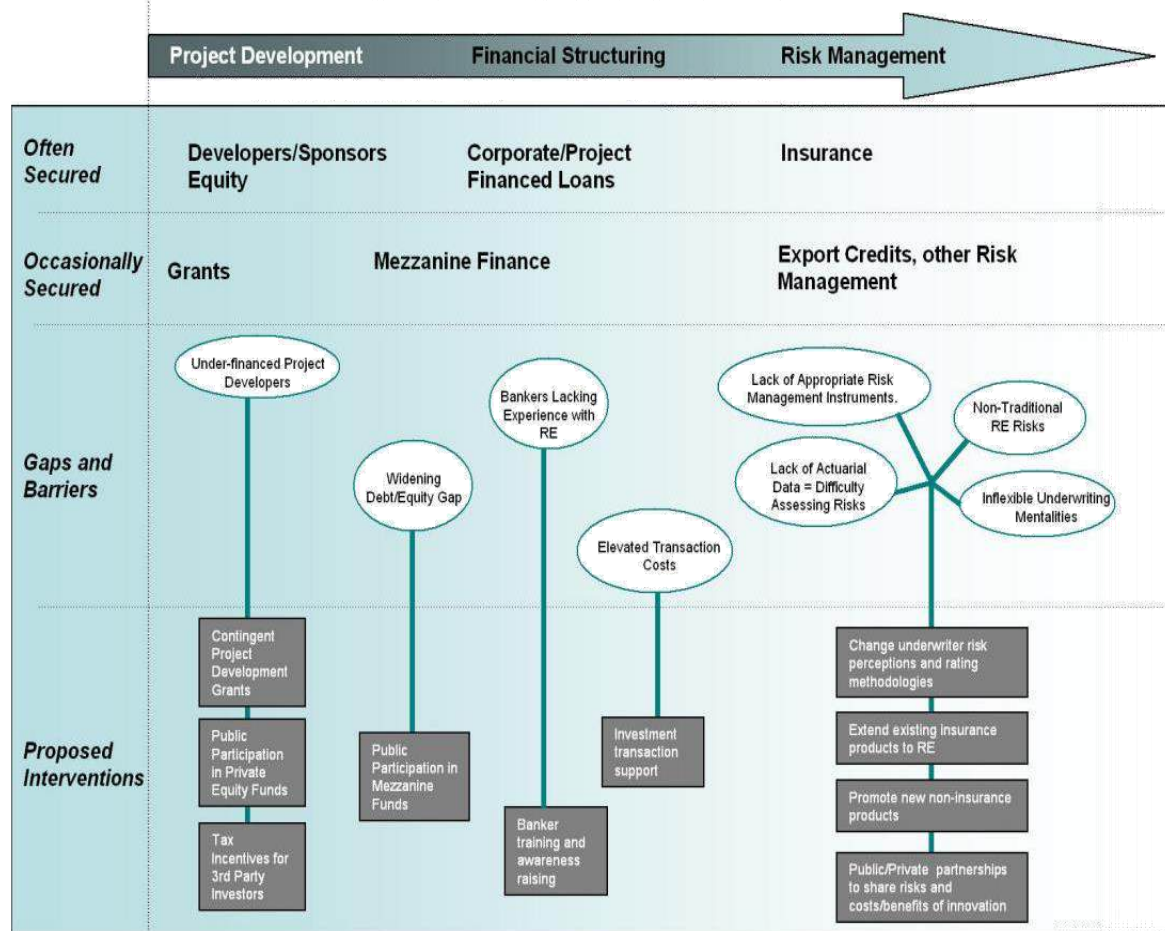
The Off-Grid Finance Continuum



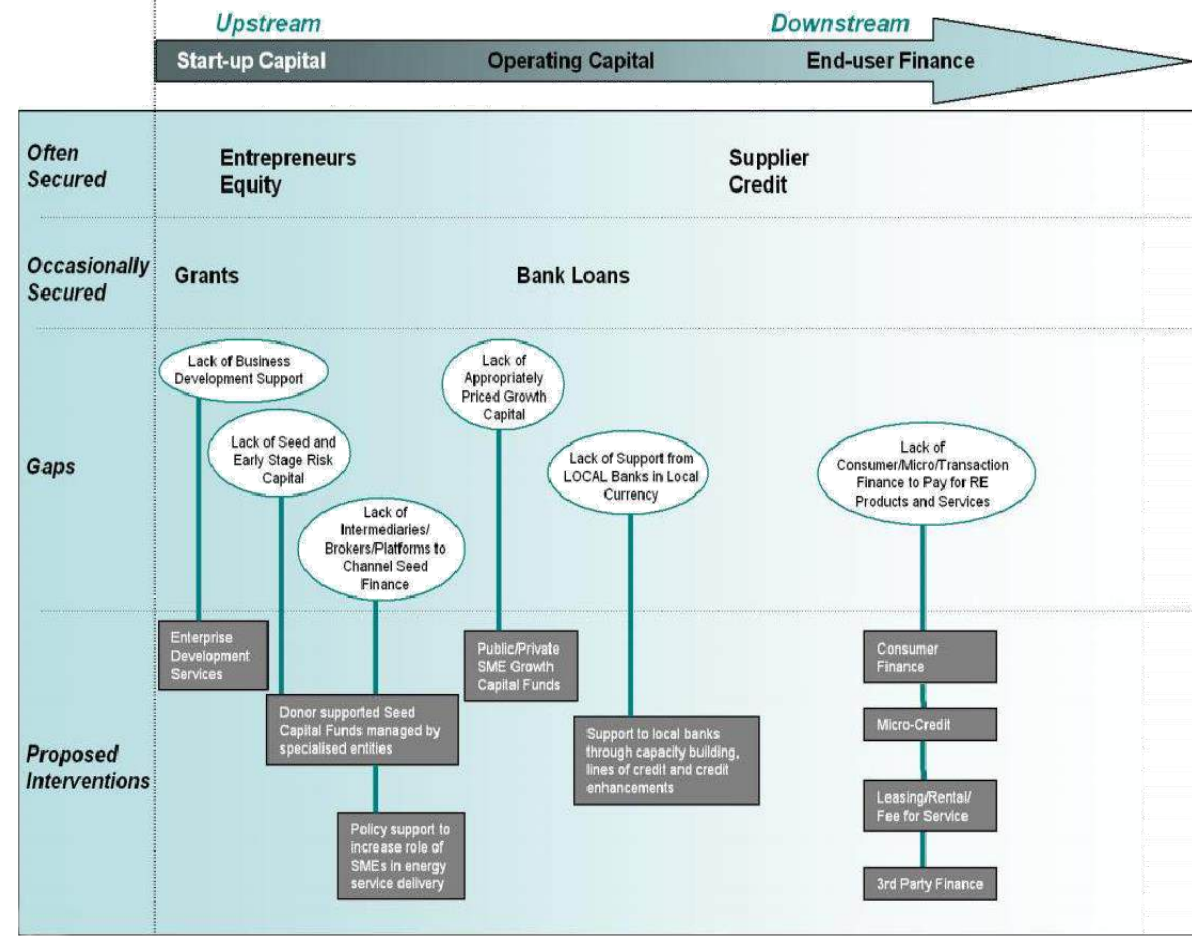
REN21 - 2014

The On-Grid and Off-Grid Finance Continuum—A Comparison

The On-Grid Finance Continuum



The Off-Grid Finance Continuum





Global Off Grid Renewable Energy Projects

Private, Public and PPP led DG Projects



**Private Sector Led
Projects**



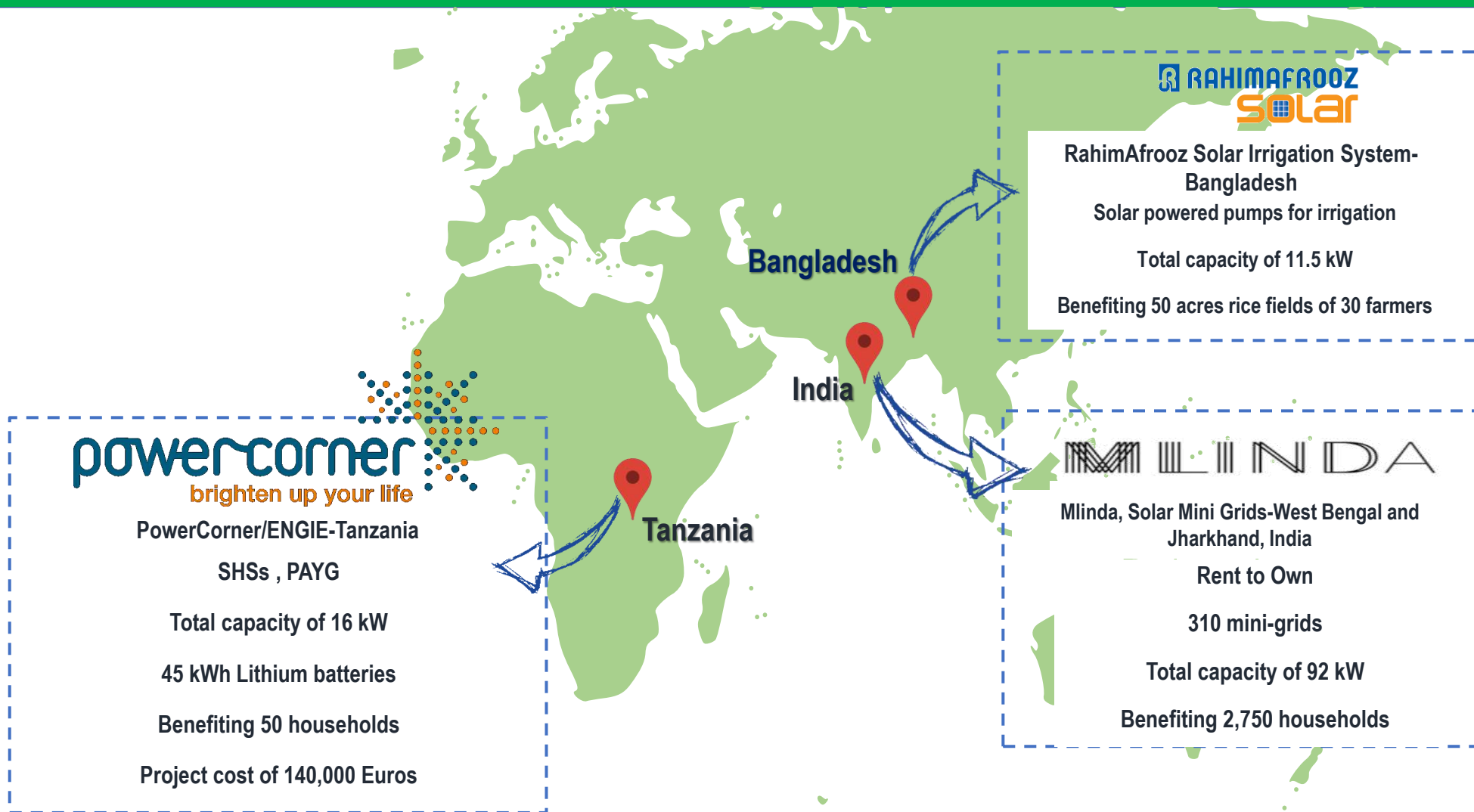
**Government Led
Projects**



**Donor/Government
Funded and
Private/Multi Party Led
Projects**

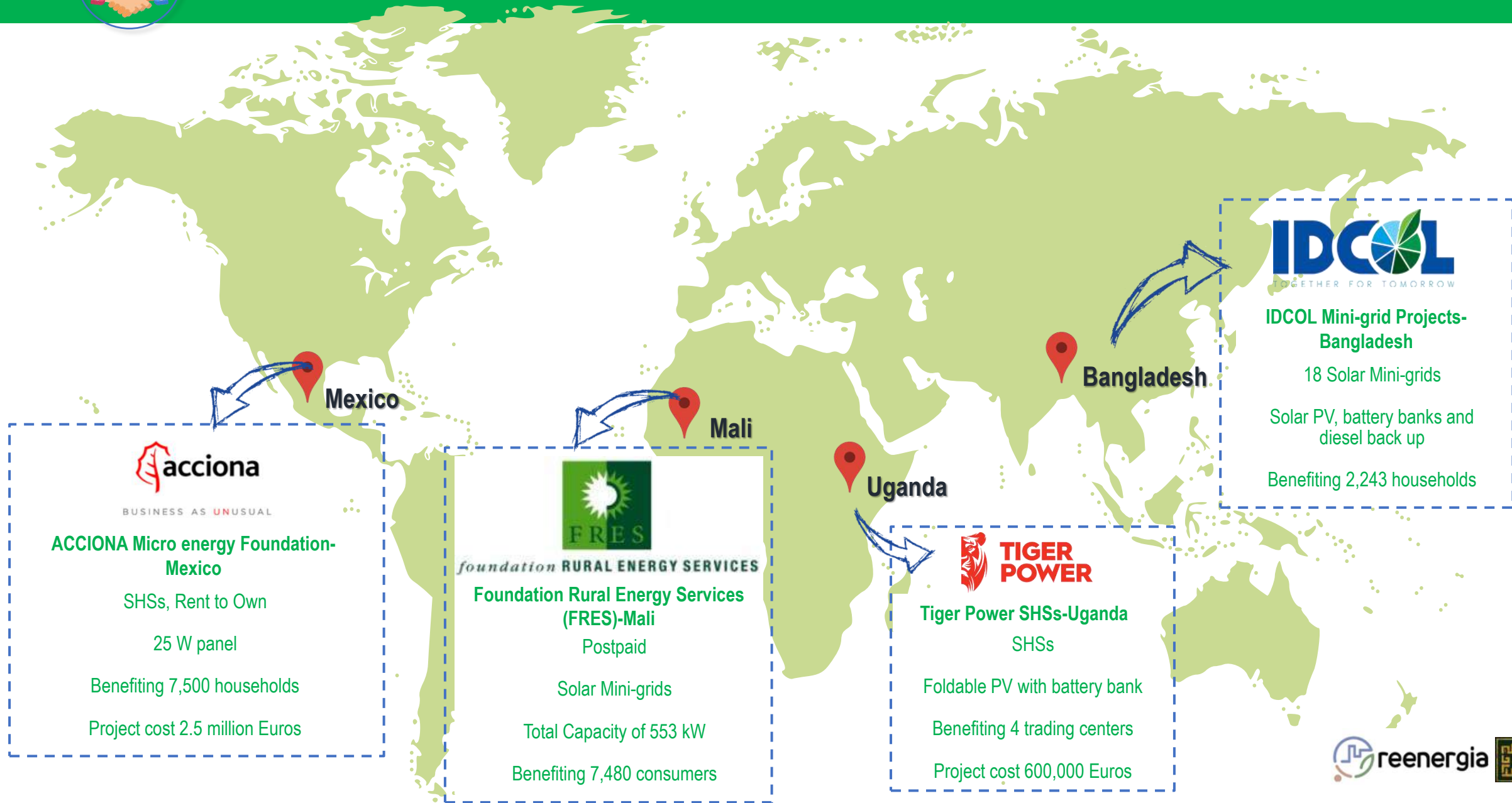


Globally Only A Few Private Sector Led Projects Exist Focused in Regions with Electricity Shortage- South Asia and Africa

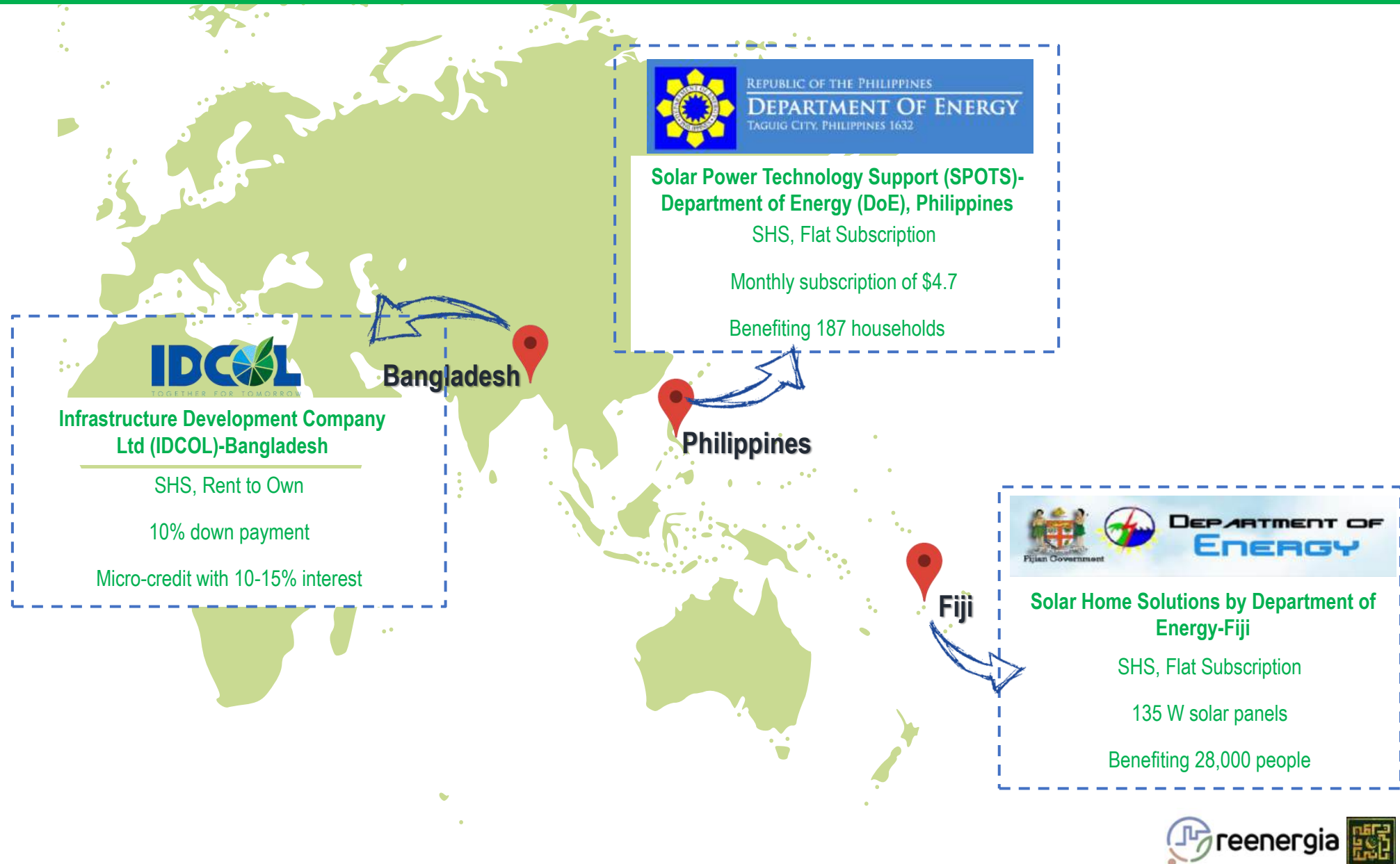


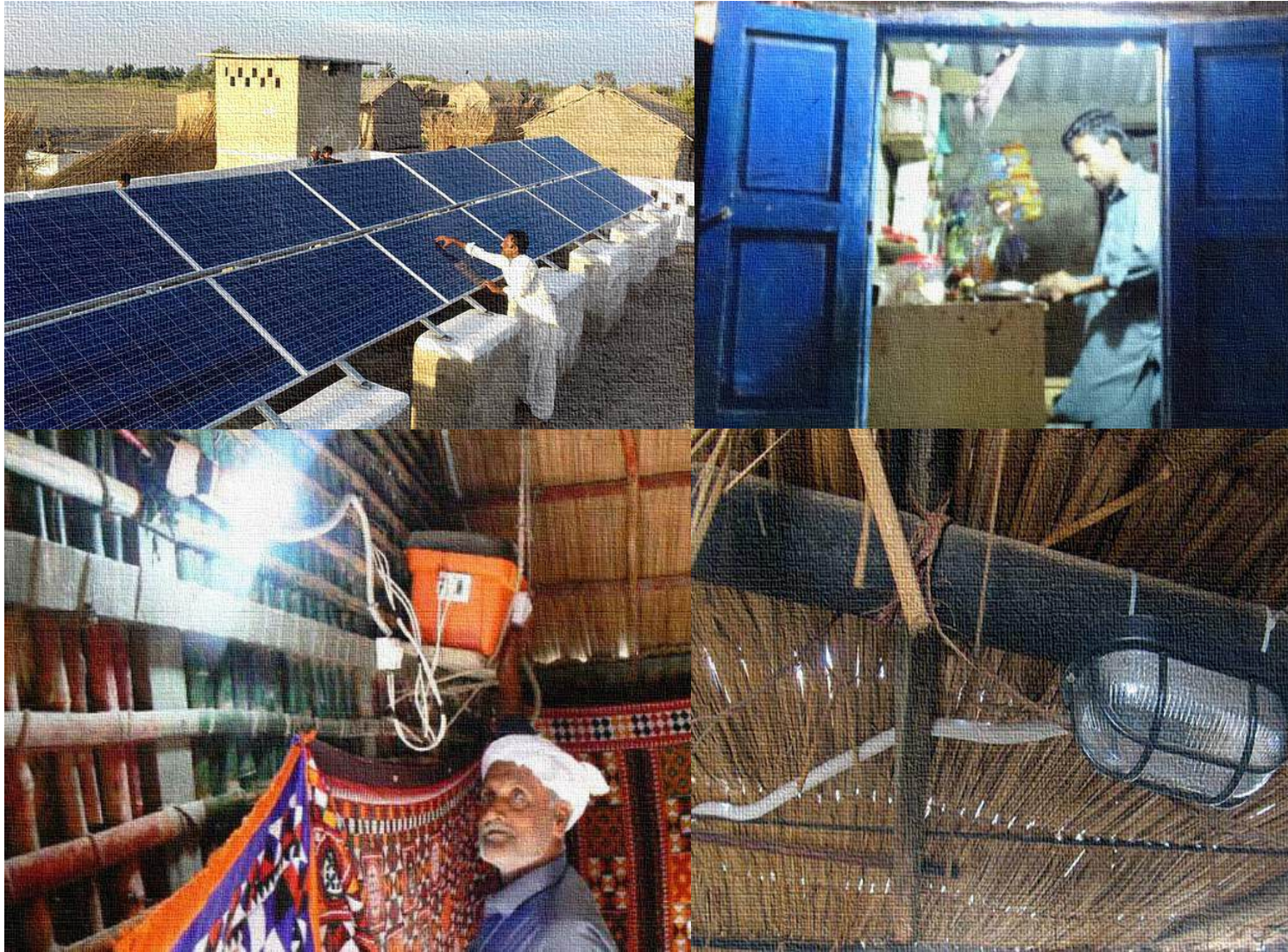


Successful Examples Of Public-Private Partnership Projects



Worldwide Government Led Projects Concentrate On SHS Provision

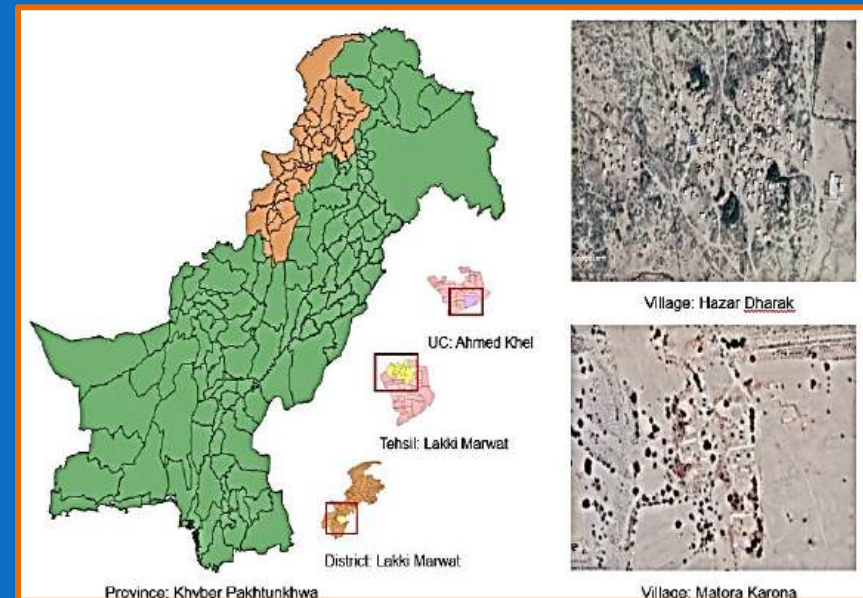
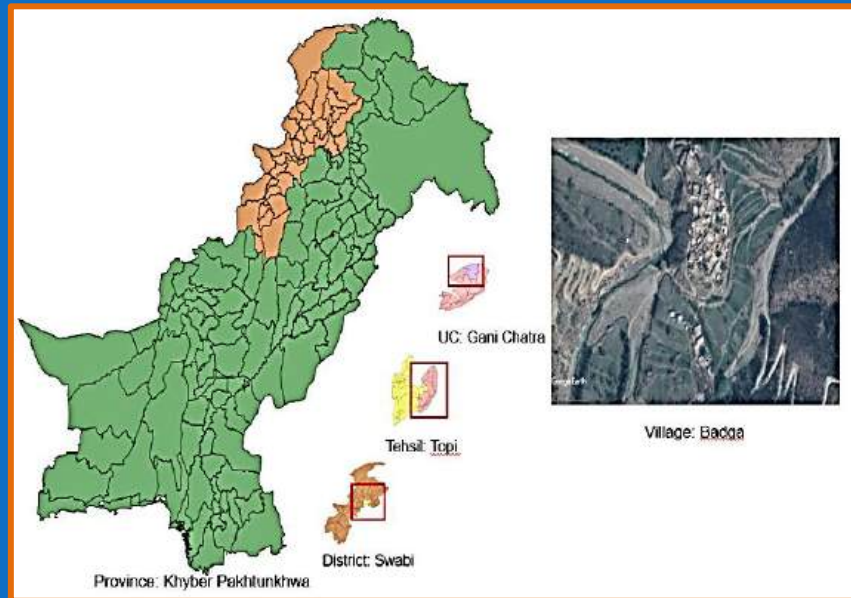
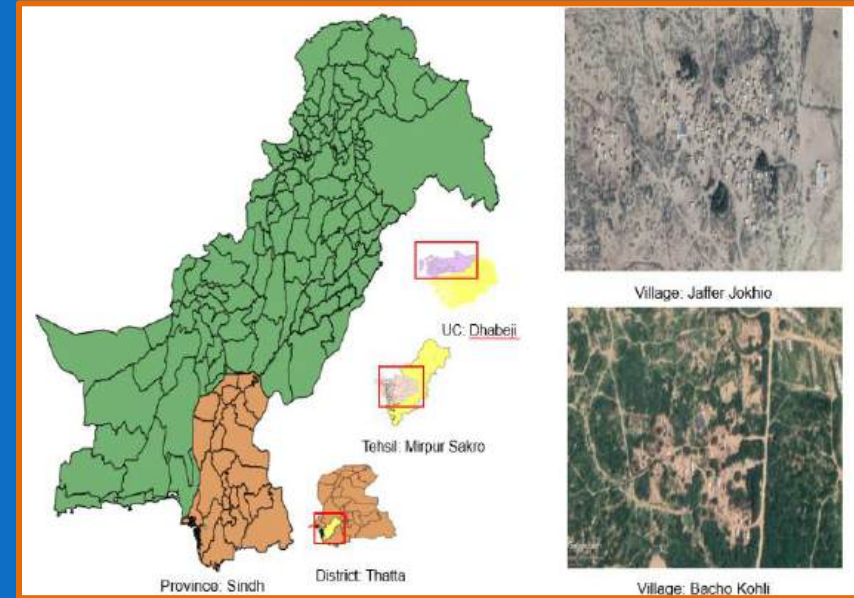
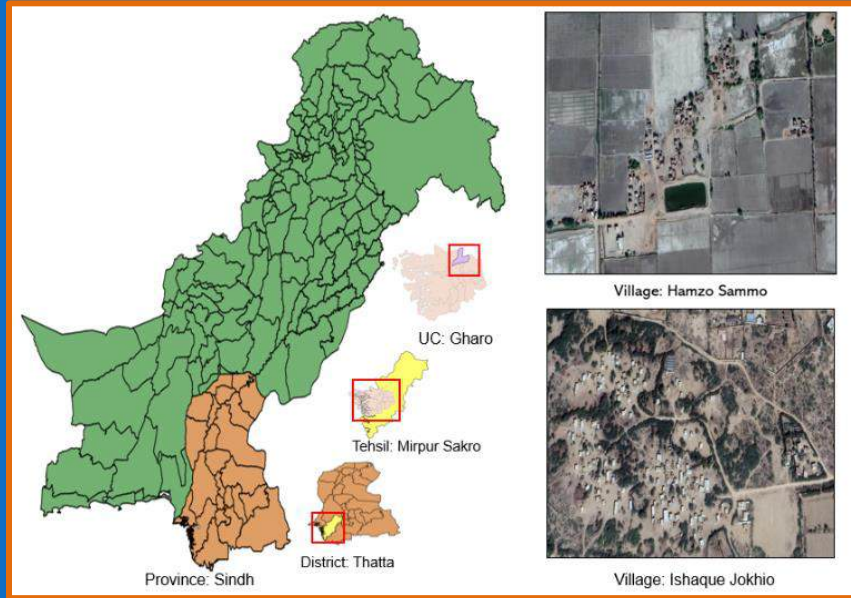




A Case Study of Pakistan's Off-Grid Distributed Generation Models

Learnings from Pakistan
Poverty Alleviation Fund's
(PPAF) Projects

Covering North and South...



Models Formulated Based on Following Parameters



Finance

- All grant
- Public Private Partnership (PPP) - Government with Local Community (LC)/ Private Agency (PA)
- Microfinance Institutions + Local Community



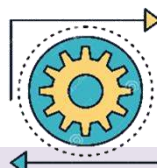
Business Model

- Pay as you go (PAYG)
- Rent to own
- Postpaid



Design

- Mini-grid
- Solar Home Systems (SHS)
- Central Grid Connectivity



O & M

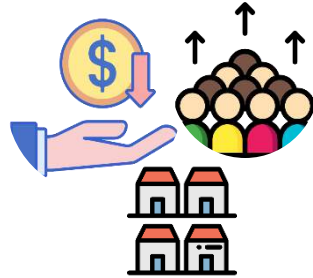
- Private Agency + Local Community (PA+LC)
- Local Community trained by the service provider
- End User



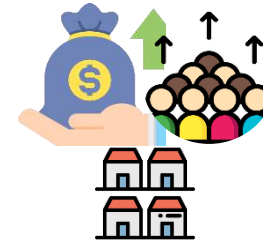
Villages Scenarios

- Private Agency + Local Community (PA+LC)
- Local Community trained by the service provider
- End User

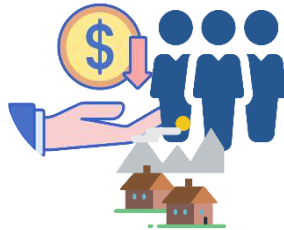
Village Scenarios in terms of population density and economic conditions



Low income-densely
populated-cluster of
villages



Relatively High income-
densely populated-
cluster of villages



Low income-sparsely
populated-cluster of
villages



Relatively High income-
sparsely populated-
single village

Key For Village Scenarios

Economic Status

Based on poverty score ranges developed by World Bank



Mean score 0-34

High income

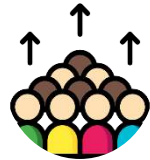


Mean score 35-100

Low income

Population Density

Compared to Pakistan's average population density



More than 281 inhabitants per square km

Dense



Less than 281 inhabitants per square km

Sparse

Village Design

Based on mini-grid transmission design



Village falls within 500-700 meters radius for transmission

Cluster



No other village within 500-700 meters design radius

Single Village

Scoring Mechanism

Scoring on the basis of international, regional, national and JLINE HRE experiences



Likelihood of success



3



6



9



Availability of the model
in current time period



5



10



15

Formula and Calculation



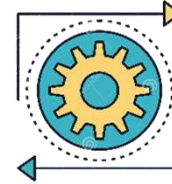
Finance



Design



Business Model



O&M Management

Private-Public
Partnership



Mini-grid



Pay As You
Go



Private Agency +
Local Community



Likelihood of
Success Score



Availability
Score

9

9

9

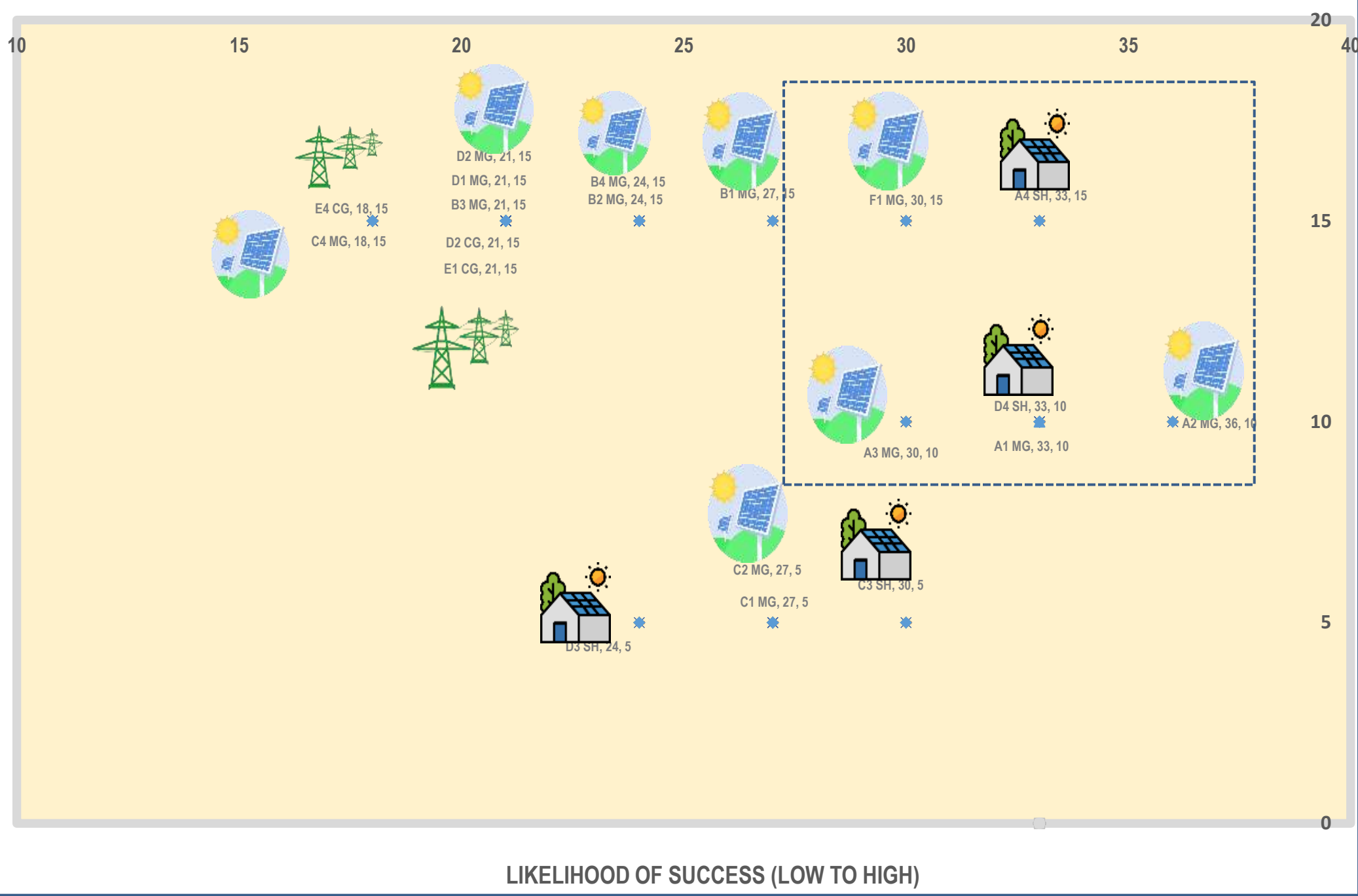
9

36

10

Mapping on Boston Consulting Group (BCG) Matrix

AVAILABILITY OF MODEL (LOW TO HIGH)



LIKELIHOOD OF SUCCESS (LOW TO HIGH)

How To Increase Private Sector's Involvement In Off Grid RE Projects In Pakistan

- There is a dire need to develop an off-grid electrification policy
- Models being developed by microfinance service providers need to understand that they are expensive and are not considering the household's pathway to the complete energy access spectrum
- Rural electrification models need to learn from micro-finance: need/utility results in payment, willingness to pay higher interest rates, social capital leading to better recovery
- The current models in off grid rural electrification in Pakistan are missing a critical partner—the technical partner—ideally a common equity partnership between the local PO and the community and a technical partner requires nurturing

Setting electricity markets to Increase Private Sector Involvement

- Improve risk appetite in local financial markets
- Hedge risk by encouraging local RE products manufacturing finance
- Bespoke financial solutions for each demography and locality
- No off-take guarantees and capacity payments rather profit based subsidies for distributed generation
- Let markets define tariffs rather only regulate quality
- Renegotiate the overall energy mix—REBA

THANK YOU.