

**SAARC Energy Centre, Islamabad
Pakistan**

THE REPORT



**Webinar to disseminate Study on “Mobilizing International & Regional Finances/ Funding for
Implementation of RE Projects in SAARC Member States”**



11th February 2020, Islamabad

**Organized by:
SAARC Energy Centre**

February 11, 2020

**SAARC Energy Centre
697, Street 43, Sector E-11/4 (NPF),
Islamabad, Pakistan
www.saarcenergy.org**



Introduction

1. SAARC Energy Centre Islamabad (SEC), under its approved Program of Activities for the year 2020, successfully conducted a webinar to disseminate Study on “Mobilizing International & Regional Finances/ Funding for Implementation of RE Projects in SAARC Member States” on Tuesday, 11th February 2020. Agenda of the webinar is available at Annexure-I.

2. Aim of the webinar was to disseminate findings of the study “Mobilizing International & Regional Finances/ Funding for Implementation of RE Projects in SAARC Member States” which was conducted by SEC in 2018. The objective of the study was to find out how international/regional financial resources could be mobilized to address the challenges related to financing of RE projects and to propose an efficient mechanism to mobilize climate financing for the involvement of private sector in the SAARC region.

Participation

3. The webinar was attended by a total of 41 professionals representing public sector organizations, academia, private sector, and other stakeholders within and outside SAARC region. Resource Persons from India and Pakistan shared their knowledge pertaining to government policies, existing practices, and international experiences in financing RE projects. The participants list is available at Annexure-II.

Description

4. The webinar started with opening remarks by Mr. Mohammad Naeem Malik, Director SEC. Mr. Malik welcomed all the participants and thanked Resource persons for their time. The technical session comprised of presentations by the Resource Persons. Each presentation was followed by a brief Q & A session. In the end, the program coordinator from SAARC Energy Centre read out conclusions, which were gathered during the webinar.

Before closing the webinar, the Program Coordinator offered remarks of appreciation to all the participants and Resource Persons.

Technical Proceedings

5. A total of four resource persons shared their knowledge in the webinar. Details of the Resource Persons are available at Annexure-III and their presentation slides at Annexure-IV. Brief information of each delivered presentation is as follows:

Presentation 1 – Overview of Renewable Energy Landscape in SAARC

Mr. Rahul Raizada, Director, M/s PricewaterhouseCoopers (Pvt.) Ltd. India.

6. Mr. Raizada has hands-on experience in advising clients in the areas of Distribution Reforms, promotion of Renewable Energy and PPPs. He gave an overview of the Renewable Energy landscape in SAARC nations. He apprised the participants on need, potential and status of RE technologies in the region. He briefed the participants on existing institutional framework and RE programs in each Member State. Mr. Raizada concluded his lecture by explaining various modes of financing in Renewable Energy sector.

Presentation 2 – Financial Instruments for RE Financing

Mr. Ankit Vivek, Associate Director, M/s PricewaterhouseCoopers (Pvt.) Ltd., India.

7. Mr. Ankit Vivek has vast experience across various sectors of infrastructure in the areas of Business Planning, Market Assessment, Financial Analysis and Revenue Modelling. He started his presentation with an overview of financial instruments and explained each instrument in detail. He first explained traditional financial instruments such as debt finance and equity finance. Then he apprised the participants on guarantees including government guarantee, political risk guarantee and currency risk guarantee. In the end he explained about innovative financial instruments such as Green bonds, Infrastructure Investment Trusts (InVITs), Carbon financing, Small-scale renewable energy projects (SREPs) financing, Asset Backed Securities (ABS) and Micro financing. He informed the participants that availing the innovative financial instruments along with traditional financial instruments can surely increase the share of RE in SAARC region.

Presentation 3 – Key Findings and Recommendations

Mr. Sandeep Kumar Mohanty, Director, M/s PricewaterhouseCoopers Private Ltd., India.

8. Mr. Sandeep Kumar is a financial expert, specializing in Finance and Strategy. He was the key author of the study report. He shared key findings and recommendations of the study report with the participants. He emphasized on institutionalizing the clean energy policies. He explained that, an effective national policy on renewable energy is the crucial first step to shape the markets and geographies, that financiers find attractive for investments.

9. Mr. Kumar apprised the participants that management of renewable energy finance programs should be done by independent organisations i.e., their decisions cannot be ratified by anyone in the executive or legislative branches of government. He stressed on reducing the investor cost, increasing investor confidence & decreasing risks associated with renewable energy projects. He briefly explained mobilizing International initiatives such as Clean Development Mechanisms (CDM), Nationally Determined Contribution (NDC) etc. In the end he stressed to encourage Cross-Border programs, collaborations, and cooperation for development of renewable energy sector and evolution of one mode of financing to the other.

Presentation 4 – Financial Incentives & Mechanisms to Encourage Private Sector Investment

Mr. Amer Zafar Durrani, CEO, Reenergiza-Enhara, Pakistan.

10. Mr. Amer Zafar Durrani is an acknowledged development expert and president of an energy consultancy firm; presently involved in renewable energy and community driven development. He apprised the participants on the role of financial incentives and mechanism to encourage private sector investment. He briefed the participants on status of private sector involvement in renewable energy sector worldwide. In the end he shared his suggestions on how to increase the role of private sector in RE project within the region.

Wrap up and conclusion

Mr. Ihsanullah Marwat, Research Fellow (Energy Efficiency), SAARC Energy Centre

11. Mr. Marwat thanked everyone for attending the event. He read out main conclusions as under:

- Finance is essential for renewable energy technology projects in two ways. Firstly, without proper financing, renewable energy projects will not materialize. Secondly, with inadequate financial structure and conditions the costs of electricity produced from renewable energy technologies will remain high.
- Enabling policies, financial structures and risk mitigation instruments are not sufficient alone to achieve the necessary scale of investment. Innovative financial instruments need to be explored. Access to capital market tools like green bonds, InvITs, etc. are becoming increasingly important in this context, as it provides necessary liquidity and long-term finance needed in the sector.
- In the same context the recommendations listed out by authors in the report and endorsed by the participants are mainly:
 - SAARC nations should design effective Public Private Partnership (PPP) mechanisms.

- Investors should use Risk Mitigation Instruments such as guarantees and insurances and the government should proactively build instruments.
- Local financial institutions should be encouraged to invest in renewable energy projects.
- Member States should develop Renewable Energy specific policy and incentives.
- Decentralized renewable energy solutions should be encouraged.
- Institutional Framework with roles and responsibilities should be developed at the SAARC level.
- Cross-Border programmes, collaborations and cooperation should be initiated for development of renewable energy sector.

Closing of Webinar

Mr. Ihsanullah Marwat, Research Fellow (Energy Efficiency), SAARC Energy Centre

1. Mr. Ihsanullah Marwat, informed all the participants that the presentations will be available on SAARC Energy Centre's website (www.saarcenergy.org). He requested the participants to submit suggestions and comments to SEC for any further improvement of these webinars. They may also suggest and submit any topics of their interest to SEC for arranging future webinars. He closed the webinar with a thank you note to everyone attending the Webinar.

2. All the presentations delivered during the webinar are available at SEC's website www.saarcenergy.org.

Annexures

Webinar Agenda

Webinar to Disseminate Study on “Mobilizing International & Regional Finances/Funding for Implementation of RE Projects in SAARC Member States”

Tuesday, 11th February 2020

1030 – 1035	Introduction
1035 – 1140	Opening Remarks <i>Mr. Mohammad Naeem Malik, Director, SAARC Energy Centre.</i>
1040 – 1110	Overview of Renewable Energy Landscape in SAARC <i>Mr. Rahul Raizada, Director, M/s PricewaterhouseCoopers (Pvt.) Ltd.</i>
1110 – 1120	Q & A session
1120 – 1150	Financial Instruments for RE Financing <i>Mr. Ankit Vivek, Associate Director, M/s PricewaterhouseCoopers (Pvt.) Ltd.</i>
1150 – 1200	Q & A session
1200 – 1240	Key Findings and Recommendations <i>Mr. Sandeep Kumar Mohanty, Director, M/s PricewaterhouseCoopers (Pvt.).</i>
1240 – 1250	Q & A session
1250 – 1330	Lunch Break
1330 – 1400	Financial Incentives & Mechanisms to Encourage Private Sector Investment <i>Mr. Amer Zafar Durrani, CEO, Reenergia-Enhara</i>
1400 – 1410	Q & A session
1410 – 1420	Conclusion and Recommendations
1420 – 1430	Closing of Webinar

Information for the participants:

- All times mentioned in agenda are according to Pakistan Standard Time (PKT). The participants from other Member States may attend Webinar by following their own national time. The time conversion for all Member States is given below for reference:

Country	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Sri Lanka
Local time	(PKT-00:30)	(PKT+01:00)	(PKT+01:00)	(PKT+00:30)	PKT	(PKT+00:45)	(PKT+00:30)

- The participants can ask questions to presenters by typing questions or clicking to the raised hand option into the Attendees pane of the main window of GotoWebinar software. You may send in your questions at any time during the presentations; we will collect these and address them during the Q&A session at the end of each presentation.
- All participants can also submit comments/views and/or observations on the draft study report to SAARC Energy Centre through email to Mr. Ihsanullah Marwat, Research Fellow (EE) (rfee@saarcenergy.org) before 20th February, 2020.

List of Participants

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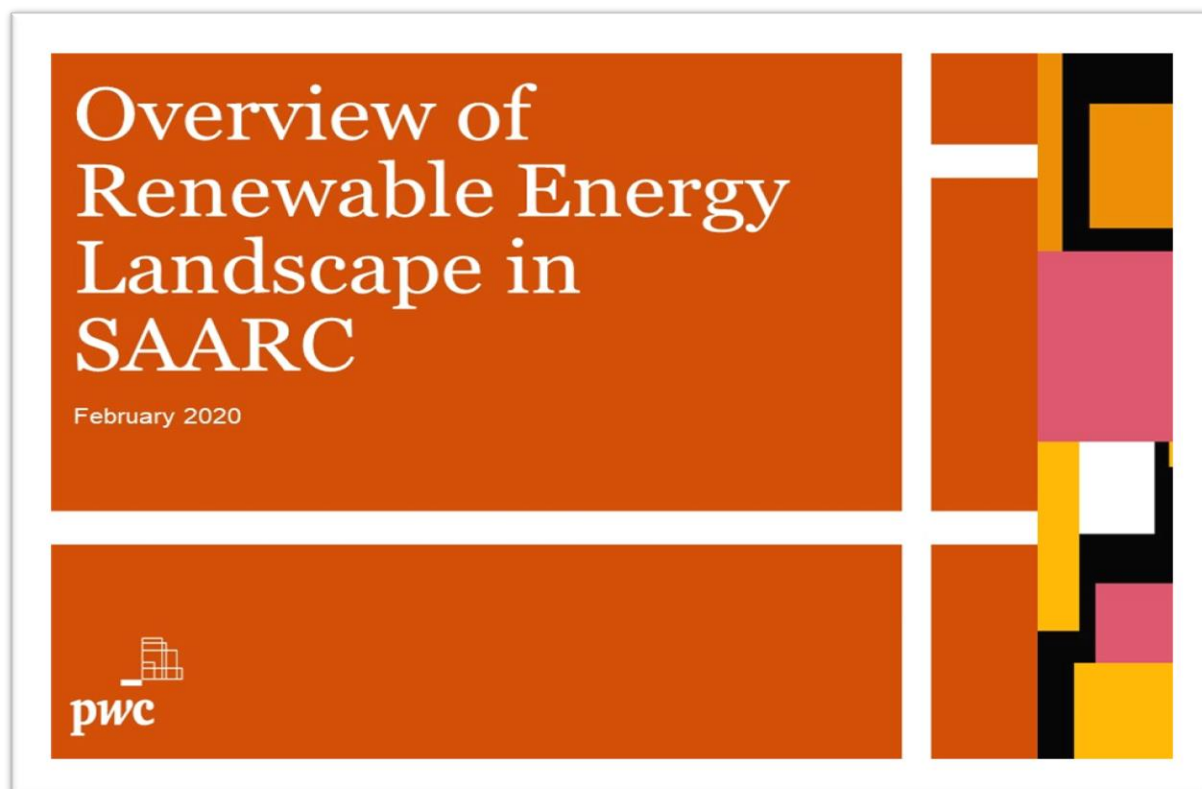
List of Presenters\ Resource Persons

Sr. No.	Name	Designation	Organization	Email address
1.	Mr. Rahul Raizada,	Director	M/s PricewaterhouseCoopers (Pvt.) Ltd., India	rahul.raizada@pwc.com
2.	Mr. Ankit Vivek	Associate Director	M/s PricewaterhouseCoopers (Pvt.) Ltd., India	ankit.vivek@pwc.com
3.	Mr. Sandeep Kumar Mohanty	Director	M/s PricewaterhouseCoopers (Pvt.) Ltd., India	sandeep.kumar.mohanty@pwc.com
4.	Mr. Amer Zafar Durrani	CEO	M/s Reenergia-Enhar, Pakistan	adurrani@reenergia.com

Presentations Delivered During the Webinar

“Overview of Renewable Energy Landscape in SAARC”

Mr. Rahul Raizada, Director, M/s PricewaterhouseCoopers (Pvt.) Ltd., India.



The Need for Renewable Energy in SAARC

- Since 2000, half a billion people have gained access to electricity in SAARC nations— one of the largest electrification success stories in history.
- However, a sizeable portion of the SAARC population is still living without reliable access to electricity.
- In order to bridge this gap in per capita electricity consumption and to keep pace with the growing demand for energy in SAARC nations, the supply of energy needs to increase substantially.
- However, conventional sources of energy alone cannot keep pace with the increased demand as they are fast depleting and often need to be imported from other nations leading to greater dependence on fluctuating fuel prices.
- Renewable Energy is the best solution for this energy conundrum.

Country	Population access to electricity (%)		Per Capita Electricity Consumption (kWh)
	1990	2016	
Afghanistan	0	84.1	119.8
Bangladesh	8.5	75.9	278.1
Bhutan	0	100	2779
India	43.3	84.5	644
Maldives	73.1	100	763
Nepal	0	90.7	454.1
Pakistan	59.9	99.1	457
Sri Lanka	52.9	95.6	636.3

USA =
12,984 kWh
Japan =
7,820 kWh

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Renewable Energy Potential in SAARC

- A regional thrust to clean energy development in SAARC has helped enhance the use of more hydro and renewable energy resources, thus reducing the adverse environmental impact of fossil fuels use and giving an alternative for the countries to meet growing energy needs.
- In the global context, this means an ultimate reduction in greenhouse gas emissions and mitigating the impacts of climate change.
- While in **Afghanistan, Maldives and Sri Lanka** there is maximum potential to develop solar power, **Nepal and Bhutan** are endowed with rich hydro resources.
- **India, Pakistan and Bangladesh** being larger countries can aim for a more balanced renewable energy mix of solar, wind and hydro.

Country	Solar Power Potential (MW)	Hydro Power Potential (MW)	Wind Power Potential (MW)
Afghanistan	200,000(6.5 kWh/day/m ²)	25,000	158000
Bangladesh	5.0 kWh/day/m ²		
Bhutan	1200 (4-5.5 kWh/day/m ²)	28,000	761
India	5.0 kWh/day/m ²	150,000	102778
Maldives	5.0 kWh/day/m ²	-	0.08 kW/m ² to 0.16 kW/m ²
Nepal	4.66 kWh/day/m ²	45,000	3.387 MWh/m ²
Pakistan	2,900,000	59,000	131,800
Sri Lanka	5 kWh/day/m ²	2,000	24000

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The Current Status (1/3)

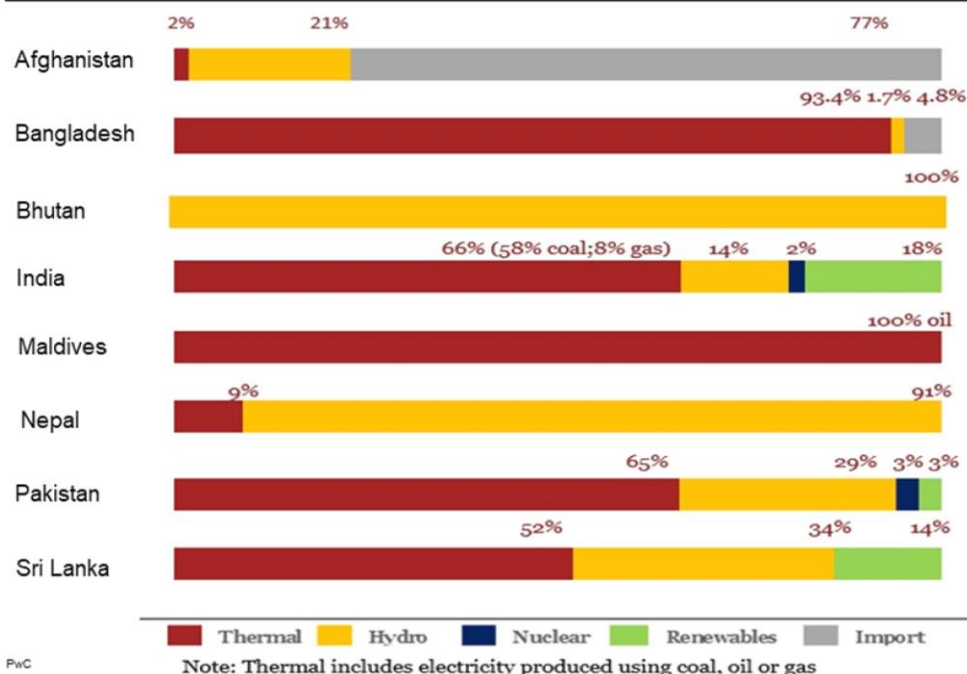
- Given below is a comparison between the current installed generation capacities and the peak demands in the SAARC nations.
- In Afghanistan and Nepal the installed generation capacity falls short of the peak demand by a large margin.
- In Pakistan and Maldives the installed generation capacity and the peak demand are almost the same.

Country	Installed Generation Capacity (MW)	Peak Demand (MW)
Afghanistan	1,420	5,000
Bangladesh	13,846	11,637
Bhutan	1,615	335.87
India	3,30,860	1,64,000
Maldives	240	284
Nepal	787	1,200
Pakistan	25,374	25,713
Sri Lanka	4,084	2,523

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The Current Status (2/3)

- Here is a detailed breakup of the energy mix of each of the SAARC member states
- The renewable energy currently holds a relatively small share in this mix



The Current Status (3/3)

- The country wise and technology wise break up of installed capacities in the renewable energy sector have been given below.
- Countries such as Bhutan and Nepal have historically seen investments in hydroelectricity.
- The other SAARC nations are catching up and the past few years have seen huge investments especially in solar and wind technologies and a sharp increase in renewable energy installed capacities.

Country	Solar(MW)	Wind(MW)	Hydro(MW)	Biogas(MW)	Other	%of total installed capacity
Afghanistan	1.802	0.23	298.2	-	-	21%
Bhutan	-	-	1,1615	-	-	100%
Bangladesh	17.35	0.90	230	-	-	2.82%
India	21,651	34,145	4,632	9,502	-	33%
Maldives	-	-	6	-	214	2.72%
Nepal	0.10	-	802.20	-	53.40	93.76%
Pakistan	400	551.40	7,340.10	257.91	26,795	31.90%
Sri Lanka	91.36	131.45	1,726.59	24.10	2,015	49.47%

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Institutional Framework (1/2)

- Each SAARC Member State has a unique institutional structure for renewable energy sector established to satisfy local requirements.
- Each country has started giving utmost priority to the renewable energy sector and set up dedicated institutional arrangement for promotion and development of Renewable Energy Technologies (RETs).
- However, in certain countries the framework is more evolved than the others:
 - In India, there is a dedicated ministry for renewable energy which has given impetus to meeting targets, budgetary allocation and policy formation for renewable energy
 - Most countries have a dedicated federal institute which falls under the power ministry to oversee renewable energy development and in countries like Bangladesh it is functioning very effectively
 - Regulatory bodies in certain states like Nepal have been recently established and their policy and tariff setting framework is in nascent stage whereas in countries such as India and Bangladesh these regulatory bodies are at a mature stage
 - Dedicated public finance institutes catering to financing renewable energy projects are present only in India and Bangladesh out of all the SAARC nations

Country	Ministry	Federal Institute	Regulator	Public Financing Institute
Afghanistan	Ministry of Energy and Water	Renewable Energy Department	Ministry of Energy and Water	Non- Existent
Bangladesh	Ministry of Power, Energy & Mineral Resources	Sustainable and Renewable Energy Development Authority	Bangladesh Energy Regulatory Commission	Infrastructure Development Company Limited
Bhutan	Ministry of Economic Affairs	Department of Renewable Energy	Bhutan Electricity Authority	Non- Existent

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Institutional Framework (2/2)

Country	Ministry	Federal Institute	Regulator	Public Financing Institute
India	Ministry of New and Renewable Energy	Energy Efficiency & Renewable Energy Management Centre	Central / State Electricity Regulatory Commission	Indian Renewable Energy Development Rural Electrification Corporation Ltd
Maldives	Ministry of Environment and Energy	State Electric Company Ltd	Maldives Energy Authority	Non- Existent
Nepal	Ministry of Energy	Alternative Energy Promotion Centre	Nepal Electricity Regulatory Commission	Non- Existent
Pakistan	Ministry of Water and Power	Alternative Energy Development Board	National Electric Power Regulatory Authority	Non- Existent
Sri Lanka	Ministry of Power and Energy	Sri Lanka Sustainable Energy Authority	Public utilities Commission of Sri Lanka	Non- Existent

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Key Programs

- Listed below are some of the key government policies of SAARC nations to give the required impetus to the renewable energy sector.
- Jawaharlal Nehru National Solar Mission from India and lucrative re-finance schemes for solar installations at home from Bangladesh are some examples that have produced great results.

Country	Policy
Afghanistan	• ANREP: Afghanistan National Renewable Energy Policy
Bangladesh	• Solar Homes Program • Solar roof-top program • Solar Irrigation Pumps, Solar mini and nano grids
Bhutan	• Foreign Direct Investment Policy 2010 • Alternative Renewable Energy Policy 2013 • Renewable Energy Master Plan by 2016
India	• Wind-Solar Hybrid Policy • Renewable Purchase Obligations (RPO's) • Scheme for Development of Solar Parks and Ultra Mega Solar Power Projects • JNNSM: Jawaharlal Nehru National Solar Mission, 2010
Maldives	• Maldives Energy Policy & Strategy, 2016
Nepal	• National Rural Renewable Energy Program (NRREP)
Pakistan	• Policy for Development of Renewable Energy for Power Generation, 2006
Sri Lanka	• Long Term Generation Expansion Plan 2018-2037

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The Future Outlook

- Each SAARC country has a renewable energy target to which all the renewable energy programs are aligned
- These targets are ambitious and are being regularly tracked by the countries and other international bodies like World Bank

Country	Target(By year)	Target(By Technology)
Afghanistan	• By 2032: 10% of total energy mix to be from renewable energy (350-450 MW of Renewable Energy)	-
Bhutan	• By 2020: additional 10,000 MW of hydropower capacity; 100% organic • By 2030: zero waste	• Solar: 5 MW by 2025 • Wind: 5 MW by 2025 • Bio- Mass: 5 MW 2025
Bangladesh	• By 2020: 10% energy mix through renewable energy • By 2021: Access to electricity for all	-
India	• By 2022: 175 GW of renewable energy	• Solar: 100 GW by 2022 • Wind: 60 GW by 2022 • Bio- Mass: 10 GW 2022 • Small Hydro: 5 GW by 2022
Maldives	-	• Wind – 20 MW by 2020 • Solar plant – 20 MW by 2020

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The Future Outlook Continued...

Country	Target(By year)	Target(By Technology)
Nepal	By 2050, Nepal will achieve 80% electrification through renewable energy sources	- Mini & Micro Hydropower – 25 MW by 2020 - Solar Home system – 600,000 systems by 2020 - Solar PV and pumps systems – 1,500 systems by 2020 - Bio gas – 130,000 household system, 1000 institutional and 200 community bio gas plants by 2020
Pakistan	The Pakistani government plans to invest a further USD 500 million in renewable energy projects in the country by 2030	
Sri Lanka	Generate 100% electricity through renewable energy	- Large hydro – 1,576 MW Biomass - 394MW - Small Hydro – 753 MW Solar- 16,438MW - Wind – 15,155 MW

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Barriers hindering growth of Renewable Energy

- All larger RET projects will generally require access to long-term funding on a project finance basis, their exposure to other barriers and risks will differ.
- Project sizes—and therefore transaction cost barriers—are generally lower for wind and geothermal projects that can be developed on a greater scale than other technologies.
- While small hydro can be competitive with conventional technologies and wind, solar energy is approaching competitiveness in some countries.
- The risks and barriers facing off-grid projects also differ from those of on-grid RET projects. These projects are generally reliant on sales of individual household or small-scale systems to rural communities.
- While technical challenges may be limited, affordability and financing ability become key.
- The very small scale of such projects, down to the individual household level, means transaction costs can become an almost insurmountable barrier.

	Wind	Solar	Small Hydro	Biomass	Solar/ Micro - Hydro
Small scale of projects	Low	Med	Med	Med	High
High financial cost	Med	High	Low	Med	Med
High exposure to Regulatory risk	Med	Med	Med	Med	Low
Uncertainties over carbon financing	Med	Med	Low	Med	Low
High costs of resource assessments	Low	Low	Med	Low	Low
Uncertainties over resource adequacy	Med	Med	Hi	Hi	Med
	ON-GRID				Off- GRID

Barriers hindering growth of Renewable Energy (1/2)

- Following is a list of some of the key barriers generally faced by renewable energy projects due to their unique nature

BARRIER	BRIEF DESCRIPTION
	Financing
Foreign exchange risk	Currency risk due to uncertain currency movements and high cost involved with market based currency-hedging solutions.
Off taker credit risk	The risk that the buyer/off-taker will not fulfill its contractual obligations. It is a key contributor to the overall credit risk of a power project.
Quality of renewable energy Projects	The credit rating of the operational renewable energy assets may be low overall, leading to operational assets not meeting investment criteria.
Lack of instruments for investment	Lack of financial instruments (or pathways) – illiquid or liquid – to invest in renewable energy.
Low returns compared to expectations	Renewable energy projects not being able to meet the risk-return expectations of investors.
Limited availability of debt capital	Limited availability of debt capital due to capital market conditions, either domestically or internationally.
Contract enforceability risk	Drastic reduction in cost of solar power generation may result in poor contract enforceability in the long-term.

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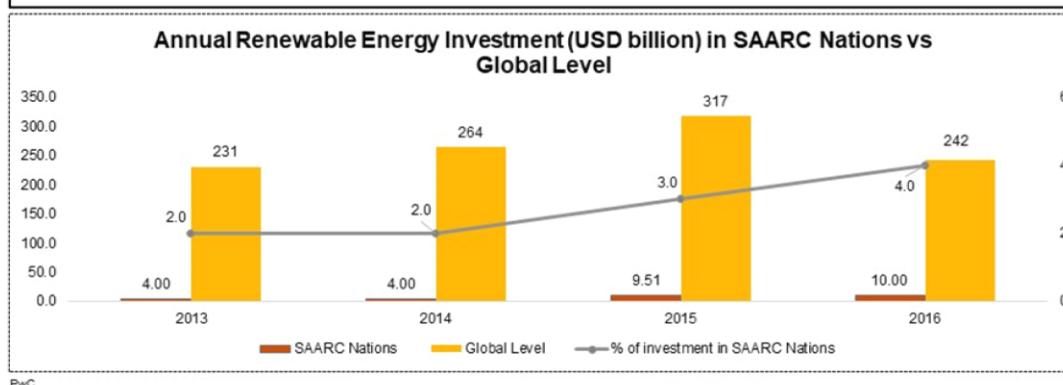
Barriers hindering growth of Renewable Energy (2/2)

BARRIER	BRIEF DESCRIPTION
	Completion
Construction risk	Risks related to increase in overall financing cost due to construction related issues – esp. due to delays in construction due to permitting.
Land acquisition issues	Issues faced in land acquisition, esp. if there is no single window clearance in place, or if the time taken to obtain clearances is high.
Transmission evacuation ²	The lack of availability of transmission evacuation infrastructure, and time taken to get the clearances and permitting.
	Operational
	Wind developers may face this issue during high wind seasons when higher than expected generation creates oversupply situations as well as congestion.
Contract enforceability risk	Drastic reduction in cost of solar power generation may result in poor contract enforceability in the long-term.
	Others
	Lack of trusted financial intermediaries may result in new and/or smaller investors staying away from the sector.
Limited understanding of sector	Many investors are not aware of renewable energy sector and, therefore, prefer to make investments in mainstream asset classes.
Regulatory/policy risk	The risks related to uncertainty in availability of incentive schemes, poor implementation of policies and non-uniform policies across states.
Net metering policies	The net metering policies across states may lack coherency as well as poor implementation.

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Investments in the Renewable Energy Domain

- There has been a major policies drive in renewable energy investment decisions and trends that vary from region to region.
- The SAARC nation's initiative towards adoption of renewable energy, has led to significant investment in the renewable energy sector.
- The investments in SAARC member states have almost doubled to ~USD 10 billion in 2016 from ~USD 4 billion in 2013.
- The growth was driven by strong investment in India with some investment in Bangladesh, Pakistan and Sri Lanka.
- Despite a decline in the investment at global level, the percentage of investment in SAARC nations has grown to ~4% in 2016 from ~3% in 2015.
- With further reforms in policies at investor's level, the SAARC nations are expected to attract more investments in the coming future.



Modes of Financing Renewable Energy sector (1/4)

There are mainly three modes of financing which countries adopt to fund their renewable energy initiatives.

1

The first mode is through **public funding**. Countries, which need to adopt this mode, are the ones where there is very limited access to basic infrastructure, the per capita income is low and markets are largely under developed. They can choose to either fund renewable initiatives through budgetary allocations or depend on global/ multilateral agencies like the World Bank, Asian Development Bank, etc. to provide funds through loans or grants. They can also try to access grants from the developed world. The main aim here is to provide their public with basic amenities. With the main motive to provide energy access to the population, there is no return expectation involved from the funds invested. Once the public sector has been able to do its bit through efficient deployment of funds, the countries can hope to move into the more advanced modes

2

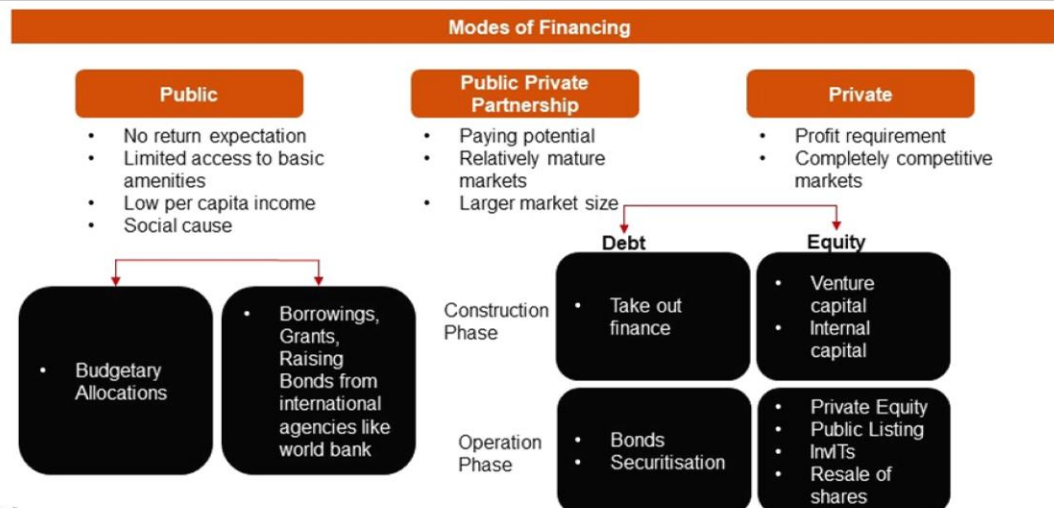
The second mode of financing is through **public private partnership (PPP)**. This mode is suited for countries with markets that have attained a certain maturity and a particular size. PPP mode brings along the technical expertise of private players along with investments with a profit making expectation against associated risks. The private investors are helped across by public sector entities enabling them with required approvals and infrastructure setup.

Modes of Financing Renewable Energy sector (2/4)

3

The third mode is through **pure private** investment operating in a free market and there is a return expectation for the risks undertaken.

The funding requirements against each of the modes vary can happen either through debt or through equity using the various financial instruments, which have been elaborated in diagram below.



Modes of Financing Renewable Energy sector (3/4)

Country	Where it stands pertaining to the modes
Afghanistan	Afghanistan is in the public funding mode of financing. The government has to take the lead in first formulating a renewable energy policy with set targets. They have to procure as much international help in terms of policy formulation and funding as possible and only the government can drive this initiative. Its aim should be to advance to the PPP mode of financing in a set amount of time.
Bangladesh	Bangladesh is in the PPP mode of financing as it is a mature market with a sizeable population. It can make use of financial instruments with public funding being as the trigger to attract investments. Some of the schemes of the Bangladesh government such as the solar home systems have done very well because of innovative local funding options and the dedicated efforts of the Bangladeshi government. It needs to stay in the PPP mode for a sizeable amount of time and develop its funding infrastructure further.
Bhutan	Bhutan is a relatively small country with abundant natural resources. Bhutan has developed the sector policies and evolved from the public funding mode to the PPP funding mode. It has to consolidate its position in the PPP funding mode by attracting investments and giving further impetus to its cross border power trade initiatives.

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Modes of Financing Renewable Energy sector (4/4)

Country	Where it stands pertaining to the modes
India	India has taken a number of initiatives in the renewables space with specific central level and state level targets. It is in the advanced stage of the PPP funding mode and can further its already robust renewable energy sector by entering the purely private mode. This process is already underway in India.
Maldives	Maldives is in the public funding mode as being an island nation, it has limited resources that can be tapped for renewable energy and at this point it is largely on the government to develop this sector.
Nepal	Nepal is a small Himalayan nation with limited market maturity but abundant natural resources. However, it is in the public funding mode at this point because the basic financial infrastructure to enter the PPP mode has still not evolved.
Pakistan	Pakistan is a sizeable market and its financial infrastructure is mature enough to handle the PPP funding mode of renewables, which is imperative for a country of this size. However, the policy framework and government initiative is lacking in the renewable energy space as priority is being given to other sectors.
Sri Lanka	Sri Lanka is an island nation with a robust renewable energy framework and many initiatives taken by the government to develop this sector. Hence, it is currently in the PPP funding mode of financing.

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“Financial Instruments for RE Financing”

Mr. Ankit Vivek, Associate Director, M/s PricewaterhouseCoopers (Pvt.) Ltd., India.



The Need for Renewable Energy Finance

Improved Economics of Renewable Energy

- Since all SAARC countries are **emerging economies**, the emphasis has traditionally been on encouraging the **lowest cost of energy generation**.
- Over the past couple of years, considering the technological advances and the increased scale of **renewable energy installations** worldwide, renewable energy has **now become very competitive** and in some countries has also reached cost parity with thermal.
- Renewable energy has a number of qualitative benefits which are of great importance because countries all over the world are becoming more focused towards environment and reducing carbon footprint.
- In order to provide energy in the **most remote areas**, which is a challenge in SAARC nations, renewable energy comes out as the most viable option with readily available fuel and use of small scale projects and off-grid installations to reach these areas

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Need for External Finance

- In order to meet the **aggressive renewable energy targets** set by the countries, there is a clear need to accelerate investments and expand finance access significantly in the sector to bridge the currently prevailing financing gap.
- To this end, **various stakeholders need to be engaged**, including governments, national financing vehicles, development finance institutions and the private sector.
- Some of the challenges faced by the private sector in accessing finance and attracting capital into renewables include **unfavorable scale of project, lack of long-term and project financing, weak or underdeveloped local financial markets constraining re-finance or exit from the project, general knowledge, resource adequacy and capacity gaps among the project stakeholders and investment risks**
- We have aimed to address these challenges through our study

Overview of Financial Instruments

A variety of debt or equity financing instruments are available to support RE projects. Over the years, various kinds of innovative financial instruments and structures have been deployed. These innovative instruments have proved to be a successful mode of investment into matured markets. The selection of instruments varies from projects to projects depending on the type of risks faced by the investors and the maturity of the financial markets.

Debt Finance Instruments

- Senior Debt
- Subordinated Debt (Mezzanine Finance)
- Grants

Equity Finance Instruments

- Venture Capital Funds
- Private Equity Funds
- Infrastructure Funds
- Pension Funds

Guarantees and Insurance

- Guarantees
 - Government Guarantee
 - Political Risk Guarantee
 - Currency Risk Guarantee
- Insurance

Innovative Finance Instruments

- Green Bonds
- Infrastructure Investment Trusts (InVITs)
- Carbon Financing
- Small-Scale Project (SREP) Financing
- Asset Backed Securities (ABS)

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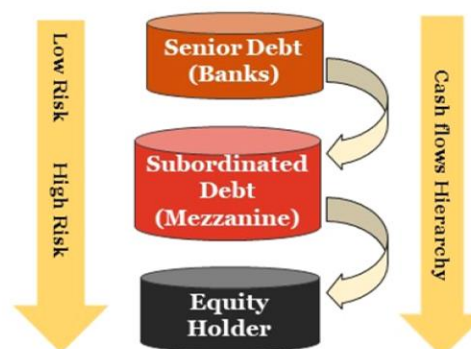
Traditional Financial Instruments

Debt Finance

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Overview of Debt Finance

- Debt funding, through conventional term loans, covers ~70% of project costs in renewable energy
- The major sources of debt financing are **international and national commercial banks**. Other sources of debt financing include **multilateral development banks (MDBs)** and the **International Finance Corporation (IFC)**, debt investment funds, equipment suppliers, and private investors
- In debt funding, the lenders must be paid before the shareholders are repaid. Hence, the lenders bear less risk than equity holders



Senior Debt:

- Provided by Banks during the start-up and construction phases with flexible payment structures against the life of the project.
- Lender is risk averse and seeks covenants and measures to minimize losses in an event of a default
- **SBI's** customized financial product for grid connected rooftop solar PV program
- **Standard Chartered's** renewable energy and environmental finance team that has lent \$4.2 billion world wide

Advantages

Debt will be at the level of project company (SPV) instead on the books of the parent company

Challenges

Local commercial banks in developing countries are reluctant to extend long-term loans. Instead, they offer a mid-term loan with a potential follow-up finance at the end of the term

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Overview of Debt Finance Continued...

Subordinated Debt (Mezzanine Finance)

- The product insulates senior debt investors from unforeseen risks and reduce cost of capital where equity is too expensive
- Some forms of subordinated debt can be converted to shares or, as in the case of preferred shares or take the form of equity but with lesser or no rights of control

Advantages

It improves the cash flows in a project and reduces the risk of senior lenders. As a result, the willingness to lend and to accept long-term loan increases

Challenges

High risk is compensated for by a higher rate of interest as compared to RoI on senior debt

Public Funding/Grants

- This includes funding of renewable initiatives through budgetary allocations or grants from global/ multilateral agencies like the World Bank, Asian Development Bank, developed world etc.

Advantages

The main motive to provide energy access to the population, there is no return expectation involved from the funds invested.

Challenges

Usually required in countries where there is very limited access to basic infrastructure, the per capita income is low and markets are largely under developed

Sri Lanka Renewable Energy Program:

The World Bank is funding projects related to in grid-connected, mini-hydro, off-grid village-level hydro and SHS. These funds are channeled to the MoF and Planning as an International Development Association (IDA) credit.

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Equity Finance

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Overview of Equity Finance

Renewable energy equity investors take an ownership stake in a project, or company. It involves a range of financial investors including Private Equity Funds, Infrastructure Funds and Pension Funds with varied features in terms of risk appetite, loan tenor and expected returns.

	Venture Capital Funds	Private Equity Funds	Infrastructure Funds	Pension Funds
How funds are raised	Funds are raised from wide range of sources with high-risk appetite to include insurance companies, pension funds, mutual funds and High net worth individuals	Funds raised from a wide range of sources with medium risk appetite to include institutional investors and high net worth individuals	Funds drawn from a range of institutional investors and pension funds	Funds are drawn via Public equity, corporate & Government bonds real estate, private equity, cash and inflated linked assets
Appetite for Risks	High	Medium	Low	Low
Investment Tenor	4-7 years	3-5 years	7-10 years	8 - 12 years
Expected IRR	50 % to 500%	20-25%	12-15%	10-12%

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Overview of Equity Finance Continued...

	Venture Capital Funds	Private Equity Funds	Infrastructure Funds	Pension Funds
Area of Investment	New Technology	Matured Stage	Mature Stage	Mature Stage
Investors	Renewable energy venture fund (ARENA & Softbank) Sunnova Energy Corp, SunRun, Hampton Creek	Africa Renewable Energy Fund, IDFC, Abu Dhabi Investment Authority, Goldman Sachs.	Allianz Global Investors, Blackrock, GEEREF	CDPQ

Raised Equity

- Mytrah Energy raised USD 78.5 million from IDFC Project Equity and USD 19 million from PTC Financial Services.
- Solar IPP Azure Power raised USD 13.6 million from Germany's DEG

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2

Guarantees

Guarantees

Investors and lenders are naturally averse to risks that give rise to negative fluctuations in project cash flows. To attract investors, the RE projects should be strategized in such a way, that it minimizes the probability of an occurrence that gives rise to negative financial impact on the RE projects. Financial risk instruments such as guarantees transfer specific risks away from project sponsors and lenders to insurers and other parties.

Government Guarantee:

By issuing guarantees, governments are in a better position to mitigate project risks that help enable financing.

The most popular form is an assurance to enter a contract through the state utility to purchase electricity from the project.

Political Risk Guarantee:

It provides a broad coverage of risks, which occur by political events such as war, terrorism and civil disturbance, which may include losses from revolution, insurrection, sabotage and terrorism.

YAP Renewable Energy Project :

The State of Yap, in the States of Micronesia, developed a 3.6 MW solar-wind- diesel hybrid project to reduce dependency on imported diesel financed by the ADB.

To reduce the risk of late- or non-payment of loan obligations by the borrower the Federated States of Micronesia provided a sovereign loan guarantee. Commercial risk associated with securing leases for the solar installations was reduced by a long-term leasehold rights to install, maintain and operate the systems on government-owned rooftops.

Wind-power in NICARAGUA:

Nicaragua's electrification rate is among the lowest in Central America. MIGA's \$16.3 million in political risk guarantees to Eolo de Nicaragua S.A., a 44-megawatt wind farm in Rivas province, helped the country rectify its power-sector issues. The Agency's guarantees covered an equity investment by Globeleq Mesoamérica Energy Limited, Bermuda.

Guarantees Continued..

Currency Risk Guarantee:

Currency risk arises in situations in which the project has revenue in one-currency and loan payments in another.

For renewable energy projects, a mismatch between the financing currency (hard) and the revenue currency (local) is often a problem for debt repayment. Due to these concerns, some transnational project developers would only sign a contract in hard currency to insulate themselves from currency risk.

Although it can remove currency risk, it also opens up exposure to non-payment risk if the off-taker cannot pay the PPA price in hard currency. Some governments take some of the currency risk by offering USD tariffs payable in local currency. Instruments such as currency swaps can also be used for this purpose.

India's Solar Support Fund:

The Indian government, has been experimenting with the concept and has plans to launch such a fund to support solar development. Under this scheme, distribution companies will quote their price for solar energy in hard currency (USD) with a lock in period of 25-year and charging customers in Indian Rupees (INR). MNRE created a hedging fund of USD 1 billion by charging developers a hedging fee of INR 0.90/kWh (about USD 0.015/kWh). The fees would be transferred to an escrow account to cover against local currency depreciation. It will help developers access international capital and reduce high hedging costs.

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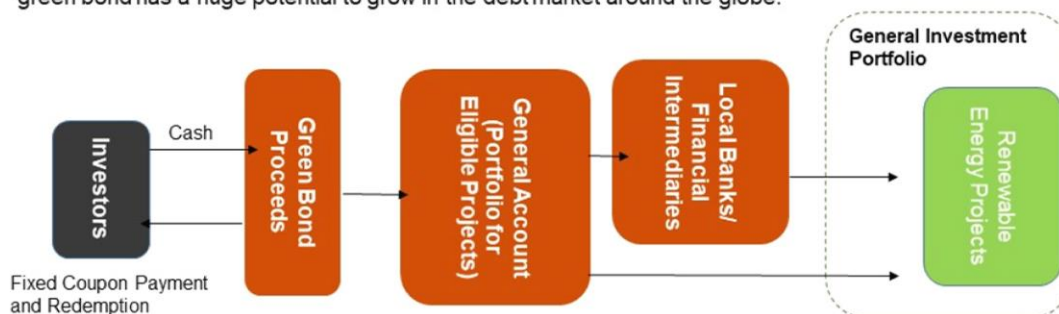
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Innovative Finance instruments

Green Bonds

Green bonds are the fixed income financial instruments that are used to promote and to implement environment solutions. In this instrument, the issuer of the green bond gets a capital to finance green projects while the investors receive fixed income in the form of interest. When the bond matures, the principal is repaid. In a way, green bonds are a subset of corporate bonds, and where the use of proceeds are allocated to environment related activities.

The European Investment Bank issued the first green bond in 2007 and raised Euro 600 million under the label Climate Awareness Bond. These bonds constitute a small fraction of the global debt market. Hence, green bond has a huge potential to grow in the debt market around the globe.



Green Bonds in India a \$7 billion market:

Green bonds in India have grown from virtual non-existence in early 2015 to a US \$7 billion market, with participation from public and private sector corporations such as ReNew, Greenko and Azure who are opting to raise finance, especially for renewable energy projects through this mechanism. The investors include pension and insurance funds.

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Infrastructure Investment Trusts (InvITs)

InvITs are instruments that work like mutual funds. InvITs are designed to pool small sums of money from a number of investors to invest in assets. Part of this cash flow would be distributed as dividend back to investors. There are four important parties to an InvIT — sponsors, investment managers, project managers and the trustee. InvITs are formed by complying with the regulatory authority.

The infrastructure company interested in getting funds from the public will form this trust, and then appoint an investment manager who will be responsible for how the assets and investments of the InvIT are managed. There is also a project manager, who actually executes the projects. The investment manager oversees it. Since the instrument is essentially a trust, the company will also appoint a trustee, who has to ensure that the functions of the InvIT, investment manager and project manager comply with regulatory rules.

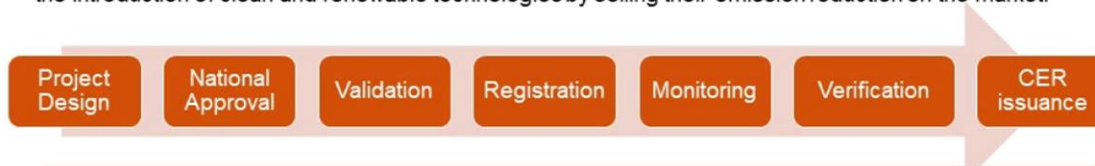
InvITs in India

According to SEBI, India there are certain rules that the InvIT issuers have to follow to safeguard the investor. First, the sponsor should hold a minimum 15 % of the InvIT units with a lock-in period of three years. Second, InvITs have to distribute 90 % of their net cash flows to investors. The trust is required to invest a minimum of 80 % in revenue generating infra assets. Only the rest can be used for under-construction assets. Dividends from the trust will be distributed to the investor depending on its cash flow and there is no dividend distribution tax on InvIT units. InvITs are suitable for high net worth individuals, institutional and non-institutional investors like pension funds, foreign portfolio investors, mutual funds, banks and insurance firms.

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Carbon Financing

The Clean Development Mechanism (CDM) is a mechanism which is intended to contribute to the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC), which is to prevent dangerous climate change. The basic principle of the CDM is simple; it allows developed countries to invest in low cost abatement opportunities in developing countries and receive credit for the resulting emissions reductions (CER). Developed countries can then apply this credit against their carbon emission reduction targets, reducing the cutbacks that would have to be made within their borders. As a result, projects in developing countries will get a new source of financing for sustainable development in the introduction of clean and renewable technologies by selling their emission reduction on the market.



Brazil & Mexico's Successful Carbon Financing

Brazil is a successful promoter of Clean Development Mechanism (CDM) projects. Brazil's CDM projects account for 40% of all CDM projects in South America and for 44% of contracted Certified Emission Reduction (CER) credits up to 2012.

In **Mexico**, a 250.5 MW and USD 600 million EURUS wind park was set up in the midst of the financial crisis. EURUS benefits from the sale of Certified Emission Reduction (CER) credits for offsetting a total of 599,571 tonnes of CO₂ annually.

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Small-Scale Project (SREP) Financing

Small-scale renewable energy projects¹ (SREPs) play a crucial role in increasing deployment of renewables in developing countries. Small projects are well suited to conditions in emerging markets as they allow developers and banks to gain experience at limited risk profile and small scale projects. However, financing options in these markets are not well-aligned with the needs of small-scale projects. Given the high costs of project finance transactions, small projects are typically financed with corporate loans, which are not designed to finance RE investments. Risks include high interest rates, short tenors that doesn't comply to the long-term nature of RE.. These prevent viable projects from being pursued and hinder the long-term development of the renewables sector.

THE LAB by Climate Policy Initiative:

CPI is an independent, non-profit organization, which is considered a leader expert group in global climate finance. It has started an initiative called 'THE LAB' which contributes to the transformational development of local institutions to enable a wider scale-up of renewable energy finance. It has pitched the idea of SREP which is essentially an instrument that aims to increase investment in small-scale renewables from 1-20MW that typically do not have access to project finance. It will do so by increasing access to long-term debt and construction finance through a "Discounting Facility" which will allow operational renewable energy projects to refinance into long-term debt and increase its financial leverage by "discounting" its future cash flows from a power purchase agreement. A review of projects with potential for refinancing found more than 100 projects totaling **540MW in Nepal and Indonesia**. A regional pilot with USD 10 million in donor funds and USD 90 million from development finance institutions and/or commercial investors could mobilize USD 90 million in equity and up to USD 260 million in total investment for new small-scale renewable energy projects.

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Asset Backed Securities (ABS)

Asset backed securities are bonds or similar instruments, which are backed by the cash flow generated by RE projects. Asset-backed securities are used for refinancing projects that are generating positive cash flows, although they can also be issued in the form of project bonds ahead of construction. Such refinancing offers a potential way to free up public funds that have been committed for development and investment, thereby allowing these funds to be refinanced to support new projects. ABS requires financial markets able to analyze and value the risks associated with such securities and, to price them. The experience with mortgage-backed securities in the recent financial crisis shows how even the most sophisticated markets can get this wrong. ABS is an innovative financial instrument to raise funds. According to Kroll Bond Rating Agency Transaction report, the total ABS market value increased in 2017 to USD 1.3 billion from USD 321 million in 2016.

to USD 10 billion from USD 5.27 billion in 2019).	
Advantage	Disadvantage
These are generally long term and lower cost loan	Sophisticated markets required to be able to analyze and price the risk associated with this type of security.
ABS is one of the innovative ways to refinance projects and thereby allowing the developer to further invest	
Potential to bundle projects together in a single security can reduce risks and substantially reduce financing costs	
Few Players in Renewable Energy Securitization Market	
Mosaic - USA	Sunnova Solar Energy - USA
Dividend Solar Finance	AES Distributed Energy - USA

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Micro Financing

Microfinance is a type of banking service that provides microloans in the range from \$100 to \$25,000 to unemployed or low-income individuals or groups who otherwise would have no other access to financial services.

Like conventional lenders, microfinanciers charge interest on loans, and can also require loan recipients to set aside a part of their income in a savings account, which can be used as insurance if the customer defaults.

Because many applicants cannot offer collateral, microlenders often pool borrowers together as a buffer: After receiving loans, recipients repay their debts together.

The first microfinance organization to receive attention was the Grameen Bank, which was started in 1976 by Muhammad Yunus in Bangladesh.

India's SKS Microfinance (Bharat Financial Inclusion Limited) also serves a large number of poor clients. Formed in 1998, it has grown to become one of the biggest microfinance operations in the world.

Bangladesh's Solar Home System (SHS) Initiative

The SHS initiative which began in January 2003 is an example of micro finance in the renewable energy space. The government-owned Infrastructure Development Company Limited (IDCOL) facilitated it. Its aim is to fulfil the basic electricity requirement of the off-grid rural people of Bangladesh. Initial funding from the World Bank was extended several times over the years via Rural Electrification and Renewable Energy Development Project. As on May 2017, 4 million solar home systems had been installed and directly impacting more than 12 % of population.

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“Key Findings and Recommendations”

Mr. Sandeep Kumar Mohanty, Director, M/s PricewaterhouseCoopers Private Ltd., India.



1

Institutionalizing the Clean Energy Policies

- An effective national policy on renewable energy is the crucial first step to shape the markets and geographies that financiers find attractive for investments.
- The SAARC Member States have ministries and policies in place that cater to developing the renewable energy sector.
- However, in many cases the policies remain on paper and significant progress has not been made on the ground.
- On the other hand, some other Member States have made significant progress in policy execution and are being lauded for the same at the world stage.
- As a first step, the SAARC Member States have to co-operate through policy conferences, which may be conducted by the SEC or other agencies to exchange notes at the highest bureaucratic level on their existing renewable energy policies that have worked for them.
- If SAARC as a region has very strong renewable energy policies in place, it will benefit each of the members making the region an attractive place for renewable energy investments.
- Additionally, the Member States will gain greater clarity and confidence to invest in each other's countries.

1

Institutionalizing the Clean Energy Policies

- Regulatory frameworks that mobilise finance for renewable energy can employ both energy policy mechanisms (e.g. feed-in tariffs, quotas and tax incentives) as well as finance policy mechanisms (e.g. banking regulation, interest rates and other monetary policy mechanisms, "Green Bonds" schemes, or establishment of special purpose renewable energy financing vehicles).
- Targeted intervention implies public renewable energy finance mechanisms combined or coordinated with accompanying non-financial interventions (e.g. renewable energy capacity building and knowledge management).

Tools			
Regulation		Targeted Intervention	
Energy Policy	Finance Policy	Public finance programs	Non-financial interventions
- Feed-in tariffs - Tax incentives - Quotas and targets - Self-supply regulation	- Environmental, Social and Corporate Governance lending criteria - Green Bonds - Differentiated interest rates - Public banking	- Tailored package of financing instruments (with flexible design) - Independent governance structure, public-private partnership	- Capacity building - Knowledge management/ expertise - Multi-stakeholder coordination

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2

Management of renewable energy finance programs by independent organisations

- Many experts recommend that renewable energy financing programmes should be managed by organisations that are "independent", meaning that their decisions should not have to be ratified by anyone in the executive or legislative branches of government.
- The aim of this strategy is to protect the mission of the programmes from political interference. An independent organisation can exist in any legal sector: public, private or non-profit. If in the private sector, however, it should have a not-for-dividend structure so that all profits are reinvested in the mission. Such companies are sometimes referred to as "common good" corporations. This protects the mission from being compromised by the need to maximise profits for shareholders.

Type of Legal Entity	Country	Programme
Public agency	Ireland, Chile	- Sustainable Energy Authority of Ireland - Chilean Energy Efficiency Programme
Public-independent	Finland	Finnish Innovation Fund
Development bank	Mexico, Chile	- Mexican Agricultural Trust Funds Development Bank - Chilean Economic Development Agency
Non-profit	Canada	Sustainable Development Technology Canada
Private not-for-dividend ("common good") company	UK	The Carbon Trust

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2

Management of renewable energy finance programs by independent organisations

Case Study

Indian Renewable Energy Development Agency Ltd (IREDA)

- *Using public finance to establish or increase the capital of a special-purpose renewable energy bank, along the lines of the IREDA, can provide an excellent option for leveraging finance into renewable energy sectors while also establishing a lasting, independent, self-sustaining finance institution that will require no additional future support from the government.*
- *IREDA was incorporated in 1987 as a public limited company and non-banking financial institution under the administrative control of the Ministry of New and Renewable Energy to promote, develop and extend financial assistance for sustainable energy projects.*
- *IREDA has for many years been the main provider of credit to renewable energy and EE projects in India and has played a catalytic role in market development, leading to commercialization of renewable energy technologies.*
- *IREDA provides direct loans to developers of renewable energy and EE projects; creates and manages innovative instruments for structured financing, securitisation and refinancing; and administers a number of government programs on behalf of the ministry. Current financing schemes include project financing, equipment financing, and financing through intermediaries.*

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3

Reduce the cost of renewable energy technologies

- In particular, when designing policies, attention should be paid to whether a given regulation supports the process of price discovery to drive down renewable energy costs.
- Where regulation blocks this process, then deregulation or regulatory reform can be appropriate for enabling entry and exit of new renewable energy providers into (and out of) the local market.
- The process of price discovery within the renewable energy sector requires free entry and exit of new and competitive renewable energy providers into local markets.
- Encouragement should be provided to the local manufacturing industry for manufacturing renewable energy equipment such as solar photovoltaics, batteries for electric vehicles, wind turbines, and solar hot water collectors.
- This will automatically reduce the cost of these technologies, develop an export market and provide employment in the SAARC region.
- In Brazil, China and India the RE manufacturing industry has created 1 million jobs and China has bagged the position of the largest supplier of RE equipment in the world.

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3

Reduce the cost of renewable energy technologies

Case Study

Energy Auctions Drive Renewable Energy Investment in Brazil²

- The Brazilian Government carries out energy auctions annually to support the viability of national manufacturing of renewable energy technology by ensuring stable demand.
- Under the regulatory structure introduced in 2004, most new power projects participate in auctions for long-term PPAs with energy distributors who are required to enter into long-term contracts for all of their electricity demand via a reverse auction system.
- In the auction process, the regulator informs participants (energy companies) that there will be a tender for a specific technology.
- The companies advise how much energy they can create for what price, and a competitive bidding process ensues. The government offers the winner a 20 year PPA, providing substantial incentive for competition among the private bidders and pushing prices down.

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4

Reducing the investor cost and increasing investor confidence & decreasing risks associated with renewable energy projects

- A range of barriers can obstruct the development and financing of renewable energy projects.
- An important factor to explain this is the front-loaded cost structure of most renewable energy projects.
- The limited experience and capacity of policy makers and national financial systems is also a fundamental obstacle to increasing renewable energy investment, even where this would be economically and commercially efficient.
- In practice, this means that risk-adjusted capital, i.e. capital which accounts for the risk return profile, is still not sufficiently available in potential growth markets for renewable energy projects.
- Risk mitigation instruments and structures are still not used enough, contributing to the high cost of capital for renewables projects.

Project start-up and development	Investment risk management	Scaling-up investment
• Limited experience in the financial sector • Availability of investment ready projects • Limited access to capital	• Political risk • Policy and regulatory risk • Counterparty risk (power off-taker risk) • Grid interconnection and transmission line risk • Currency risk • Liquidity and refinancing risk • Resource risk • Technology risk	• Insufficient investment size and high transaction costs • Financial regulations restraining illiquid and riskier investments

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4

Reducing the investor cost and increasing investor confidence & decreasing risks associated with renewable energy projects

➤ **Constraint: Project Start-Up and Development**

One of the biggest barriers affecting the release of renewable energy investment is the shortage of investment-ready or bankable projects with an attractive value proposition. For many investors, the inability to find projects mature for investment is a significant constraint.

Key Solution

- Technical assistance and grant funding for project development and document preparation can increase the renewable energy deal flow and improve the pipeline of projects ready for investment.
- SAARC Member States can collaborate with each other to conduct in-depth technical and feasibility studies such that each member state can come up with investment ready project opportunities and save investor cost in doing comprehensive due diligence.

➤ **Constraint: Scaling-up Investment**

When it comes to renewable energy, the projects are smaller in scale and we need to examine ways to break through barriers to attracting large-scale private investment. These barriers include, for instance, insufficient investment size, high transaction costs and limited market liquidity.

Key Solution: Structured finance mechanisms

- Structured finance can help overcome such barriers, especially when the underlying investment vehicles are standardised and/or aggregated to cut due diligence costs.
- In most structured finance transactions, project assets that will generate the cash flow must be isolated from the sponsor. This way, other investors are able to narrow the focus of both the risks and returns to the project itself.

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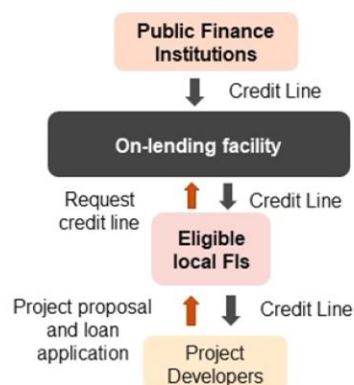
Reducing the investor cost and increasing investor confidence & decreasing risks associated with renewable energy projects

➤ **Constraint: Investment Risk Management**

Investment risks comprise of risks that make investors weary of investing in developing countries because these markets are not as stable as the developed markets. These risks are political risk, policy and regulator risk, counterparty risk, currency risk and technology risk to name a few

Key Solution: On-lending

- On-lending, also known as financial intermediary lending, can increase the availability of local debt, improve access to local financing and help build local lending capacity.
- Many DFIs (Development Finance Institutions) use their high credit quality and market access to borrow debt at low rates and on-lend them via credit lines to a government or other institution.
- While not necessarily cheaper than ordinary loans, the local lender may access consultancy services and training to develop feasible projects, thus building experience and a track record.
- This practice reduces the local banks' risk, making them more willing to lend, and improves the overall effectiveness of the investment.



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5

Mobilizing International Initiatives

Clean Development Mechanism (CDM)

- The Clean Development Mechanism (CDM) is a mechanism which is intended to contribute to the ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC), which is to prevent dangerous climate change. T
- he basic principle of the CDM is that it allows developed countries to invest in low cost abatement opportunities in developing countries and receive credit for the resulting emissions reductions (CER).
- Developed countries can then apply this credit against their carbon emission reduction targets, reducing the cutbacks that would have to be made within their borders.
- As a result, projects in developing countries will get a new source of financing for sustainable development in the introduction of clean and renewable technologies by selling their emission reduction on the market.

Case Study

- *Brazil is a successful promoter of Clean Development Mechanism (CDM) projects. Brazil's CDM projects account for 40% of all CDM projects in South America and for 44% of contracted Certified Emission Reduction (CER) credits up to 2012.*
- *In Mexico, a 250.5 MW and USD 600 million EURUS wind park was set up in the midst of the financial crisis. EURUS is permitted to generate 876 GWh annually and as a Clean Development Mechanism (CDM) project, EURUS benefits from the sale of Certified Emission Reduction (CER) credits for offsetting a total of 599,571 tonnes of CO₂ annually.*

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5

Mobilizing International Initiatives

Nationally Determined Contribution (NDC)

- 2015 was a historic year in which 196 Parties came together under the Paris Agreement to transform their development trajectories so that they set the world on a course towards sustainable development, aiming at limiting warming to 1.5 to 2 degrees C above pre-industrial levels.
- Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of these long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change.
- Each of the SAARC nations have submitted their NDCs and integrated the targets therein in their renewable energy policies.
- The onus now lies on each of the SAARC nations to follow through with these targets.

Country	Target	Investment Requirement
Afghanistan	Cut emissions by 13.6% from business-as-usual levels by 2030	USD 17.4 billion
Bangladesh	Reduce GHG emissions by 5% by 2030 from business-as-usual levels in power, transport and industry sectors	USD 40 billion
Bhutan	Plans to remain carbon neutral	-
India	Cut GHG emissions by 33%-35% of the 2005 levels by 2030	USD 1040 billion
Maldives	Cut emissions by 10% from business-as-usual levels by 2030	-
Nepal	Reduce fossil fuel dependency by 50% by 2050	-
Pakistan	Intends to reduce GHG emissions by 20% from projected 2030 levels	USD 40 billion
Sri Lanka	Cut GHG emissions by 7% from business-as-usual levels by 2030	-

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6

Encourage Cross-Border programs, collaborations and cooperation for development of renewable energy sector

Cooperation among government entities:

- Government ministries, public officials and administrators can cooperate with each other to provide guidance on policy formation, targeted interventions, trainings and on the ground execution of renewable energy projects.
- An excellent example of an amalgamation of all of the above is the power purchase agreements between India and countries such as Bhutan and Nepal in which India has helped set up hydroelectric power stations in these countries and imports power from them for domestic consumption.

Cooperation among financial institutions:

- A regional guarantee fund or facility may be established to meet specific regional development needs and position renewable energy strategically in the regional agenda.
- Independent finance institutions such as India's IREDA can cooperate with each other to discuss ways of increasing the pace of fund mobilization in renewable energy.

Cooperation among a range of other stakeholders:

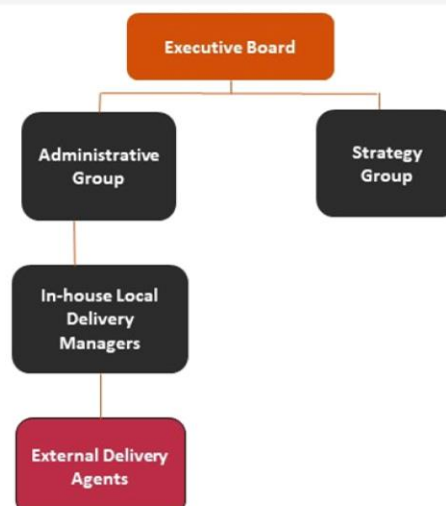
- It is equally important to engage a range of stakeholders from across the public, private, academic and non-profit sectors to increasing learning, knowledge transfer and absorptive capacity among local actors.
- This will help create awareness and share knowledge and skills that are highly developed in one country among its neighbors.

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7

Importance of cooperation among related entities of SAARC Member States

- A central, independent, mission-driven organisation at the SAARC level needs to be established.
- The mission of this organization will be to be a pioneering, participant friendly and competitive institution for financing and promoting self-sustaining investment in energy generation from renewable sources in the SAARC member states.
- Along with this central mission it will also provide support to various projects in the form of technical assistance, getting government clearances, providing crucial project execution support and so on. There would be appropriate ownership, with establishment of shared governance and control of project prioritisation.
- A partnership element between this organisation and international donors could include agreed goals and success criteria.



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8

Evolution of One Mode of Financing to the Other

There are broadly three modes of financing that SAARC Member States could be categorized in. In order to move to the next phase of financing they need to cover financial instruments and investment strategies that are applicable to their phase. Further, they shall be required to branch out on those applicable to the next phase in a set period (3 to 5 years).

Description	Public Funding Mode	Public Private Partnership (PPP) Funding Mode	Private Funding Mode
Countries	Afghanistan, Maldives, Nepal, Pakistan	Bangladesh, Bhutan, Sri Lanka	India (In between PPP and Private funding mode)
Financial Instruments	- Budgetary Allocations - Borrowings/ Grants from international agencies like World Bank - Political Risk guarantee	- Venture capital funds - Infrastructure Funds - Debt from development finance institutions/climate finance institutions - Government guarantee - Carbon Financing - Infrastructure Investment Trusts - Small scale project financing - Loan syndication	- Private Equity Funds - Pension Funds - Debt from local finance institutions/banks - Green Bonds - Asset backed securities - Aggregation, securitization

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8

Evolution of One Mode of Financing to the Other

Description	Public Funding Mode	Public Private Partnership (PPP) Funding Mode	Private Funding Mode
Countries	Afghanistan, Maldives, Nepal, Pakistan	Bangladesh, Bhutan, Sri Lanka	India (In between PPP and Private funding mode)
Investment Strategy	- Choice of policy instruments, policy design, and complexity of the policy package tailored to the actual conditions of the system in the type of market, supply or demand volume, and nature and level of risks, as well as institutional and administrative capacity. - Increasing awareness among the citizens	- Targeted interventions by the government such as priority sector lending, clean energy funds - Smart subsidies, tax exemptions, renewable obligations - Price based policies such as feed in tariff, net metering - Management of renewable energy finance programs by independent organizations - Incentives to reduce costs of renewable energy technologies - Mobilizing CDMs, NDCs	Letting the market forces of demand and supply take over with minimum requirement of government intervention

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Thank you

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“Financial Incentives & Mechanisms to Encourage Private Sector Investment”

Mr. Amer Zafar Durrani, CEO, M/s Reenergia-Enhar, Pakistan

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



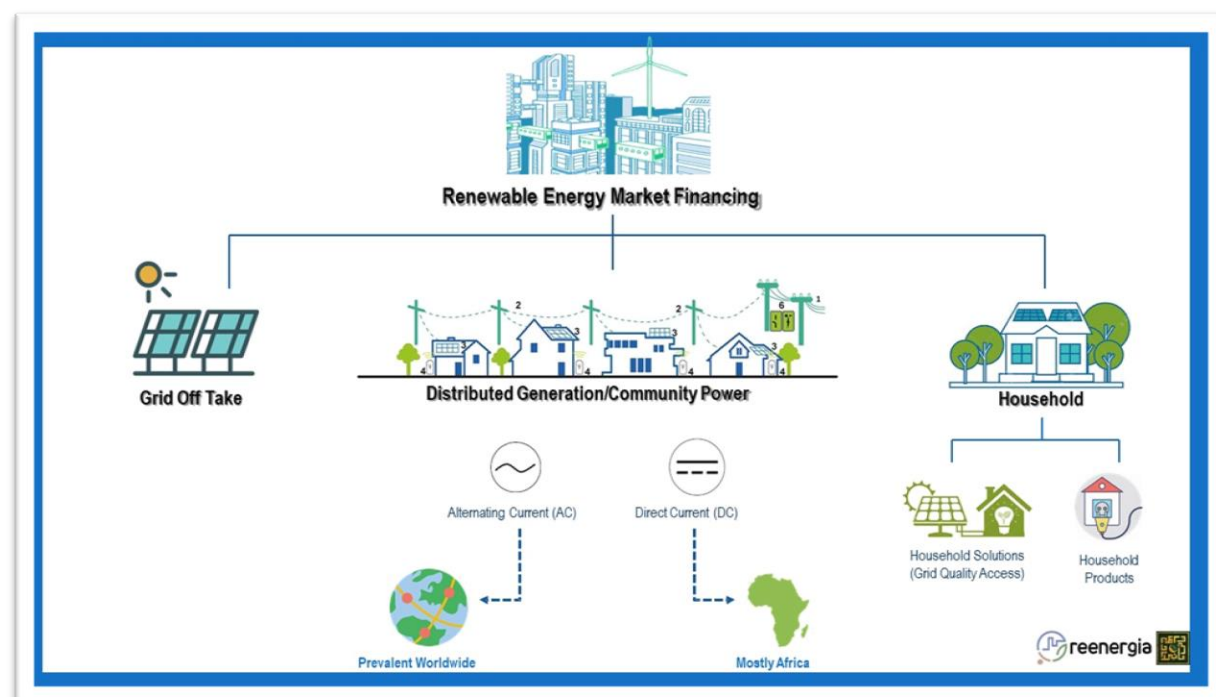
Presented by:
Amer Zafar Durrani
President Reenergia and CEO Paidartwanai

Prepared by:
Amer Zafar Durrani, Alishba Khuram, Zahid Nawaz

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







Types of Financing in Renewable Energy



Equity Finance



Project Development Capital



Debt Finance

Off-balance sheet
project financingCorporate 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		

World Bank, 2012

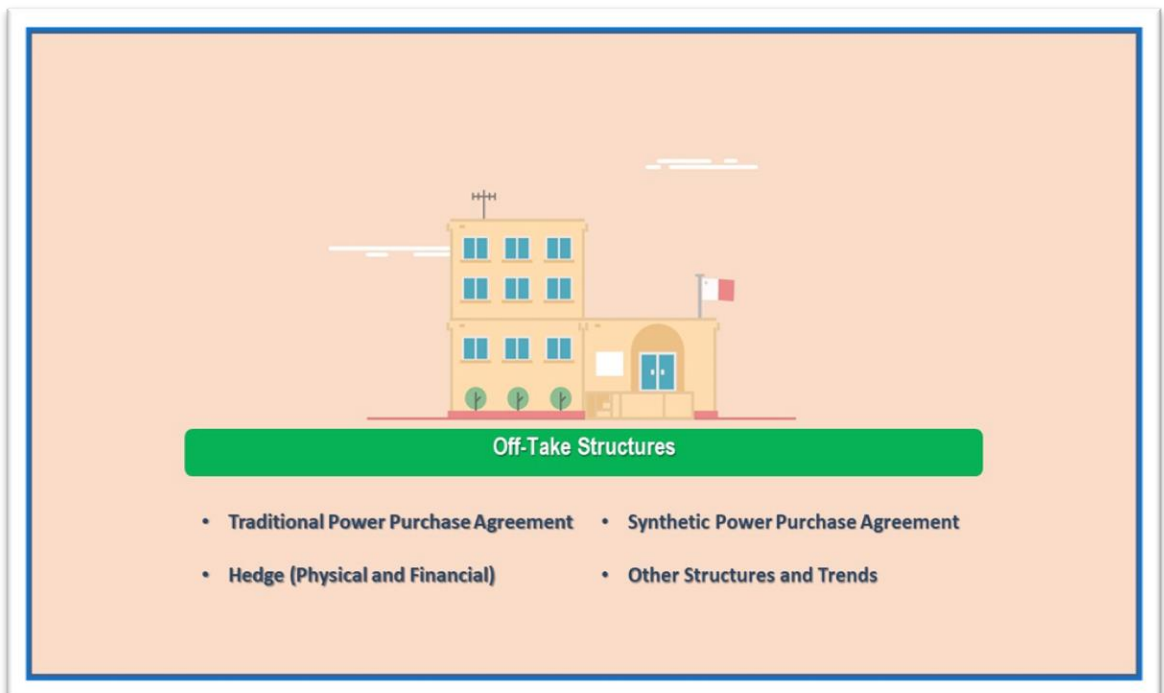


Financing and associated risks taken....

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

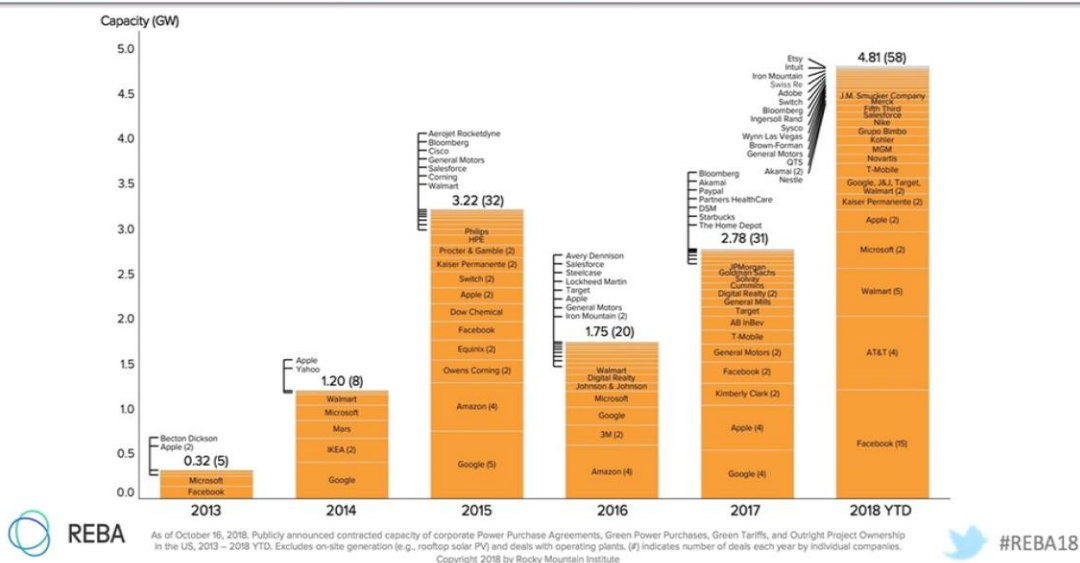
Grid Offtake Projects



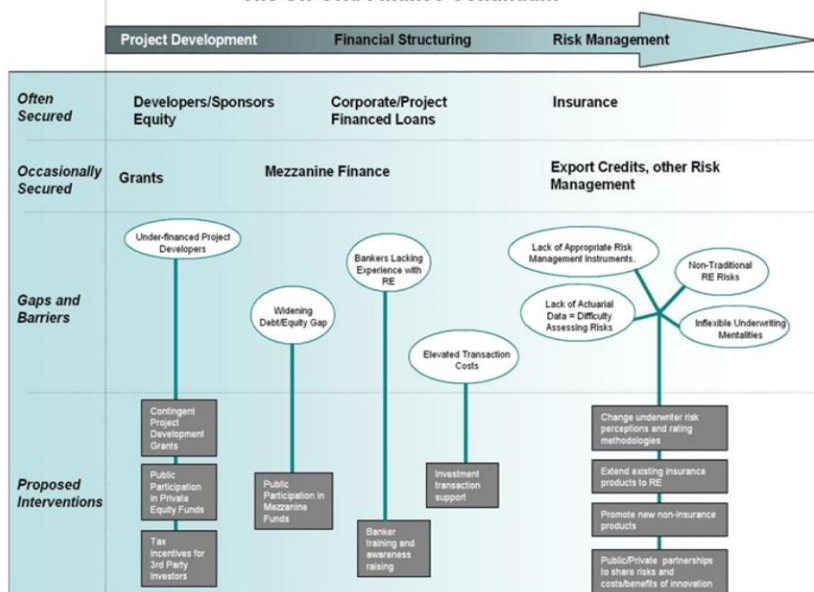


Overview of Corporate Power Purchase Agreements in the US (2013 – 2018)

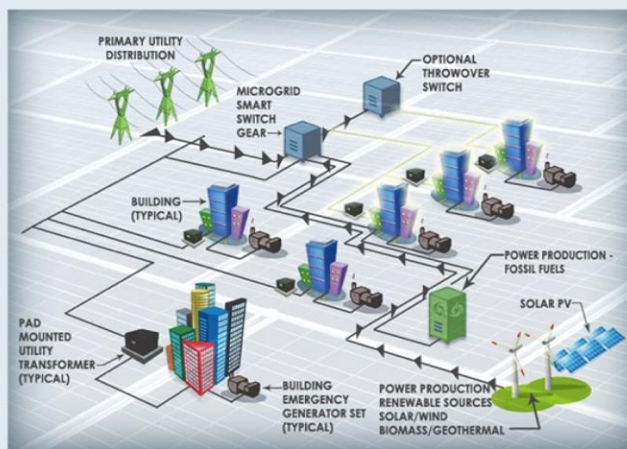
Driver: sustainability – demonstrate commitment to the environment



The On-Grid Finance Continuum



Distributed Generation



Mini-grid Business Model Components..



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

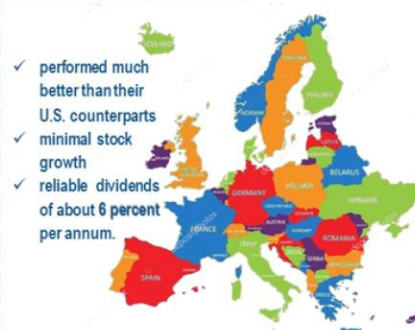
Institutional equity: the yieldco model

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

The American Experience:



The European Experience:



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

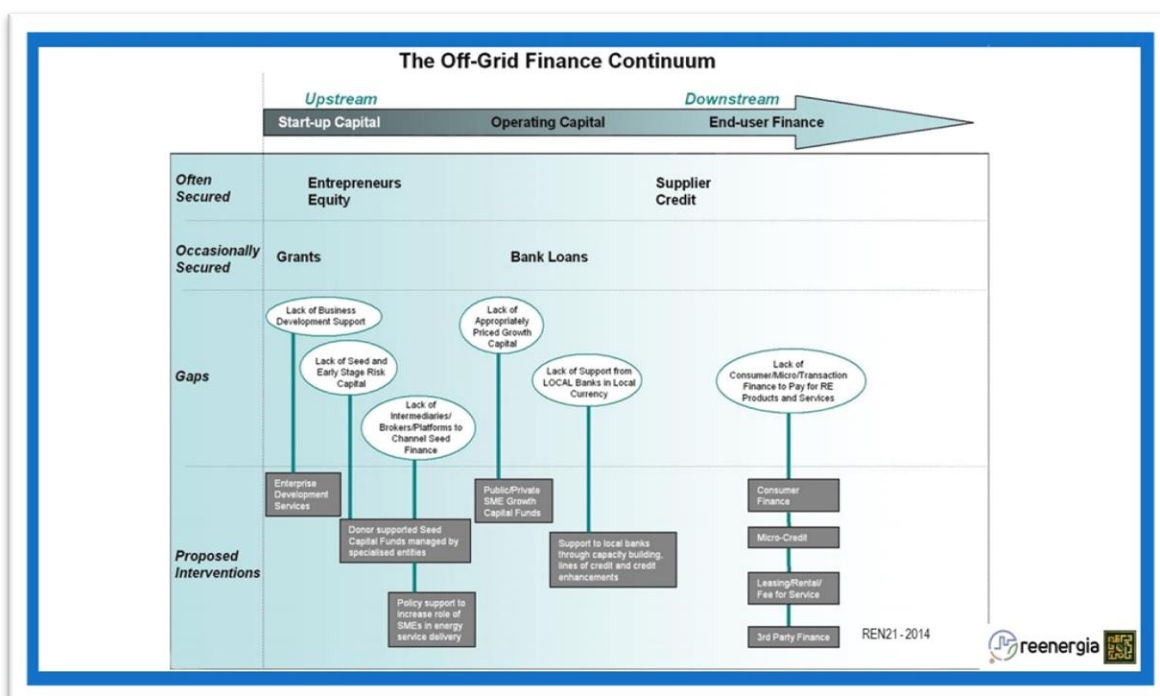
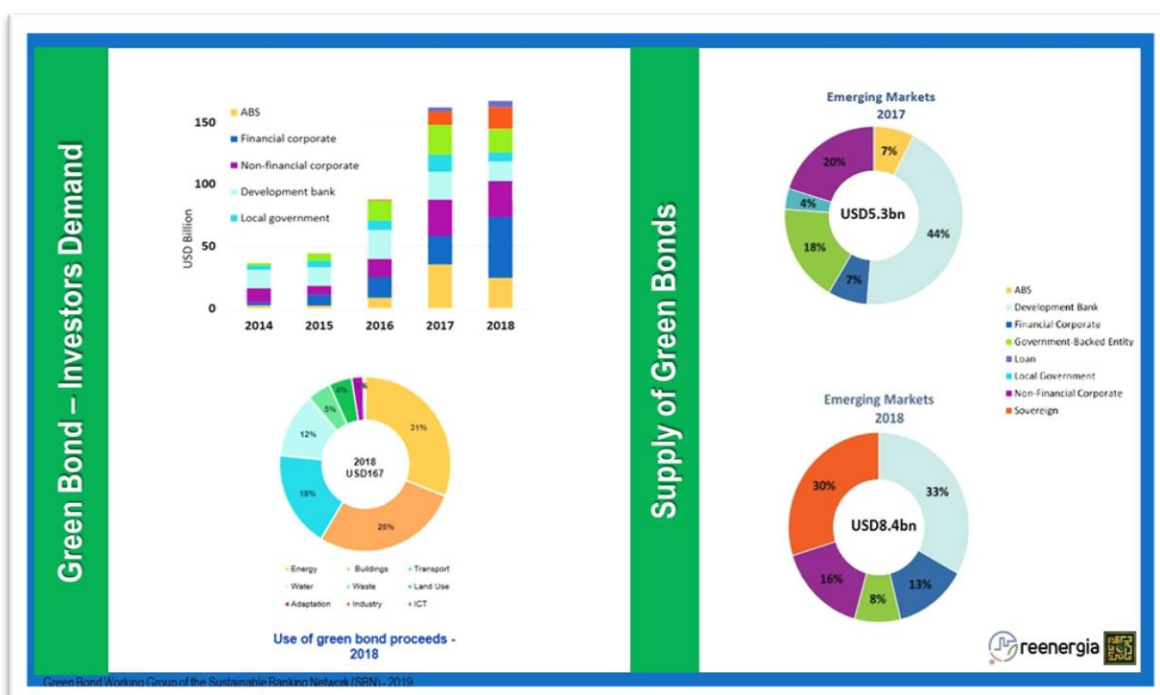


Alliant Energy

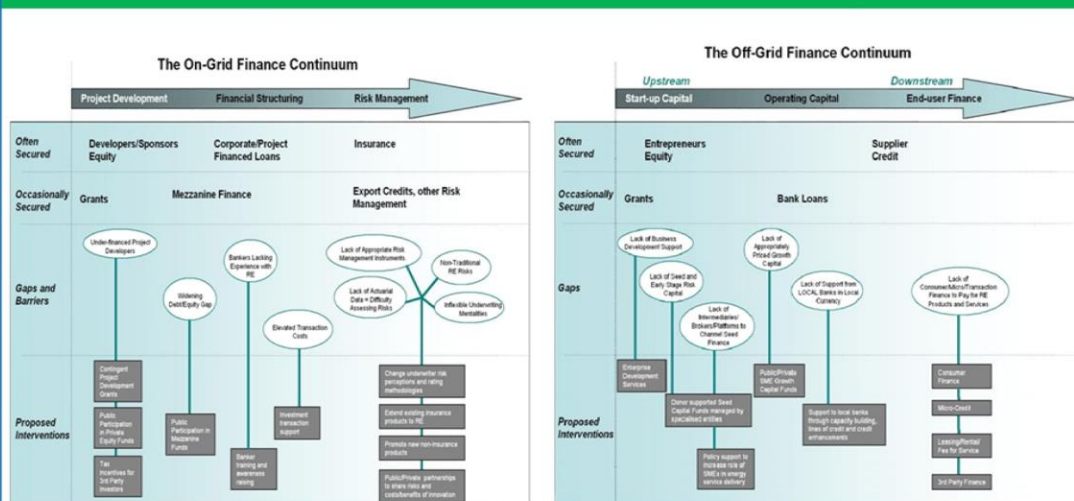
Dominion Energy
(\$362 million)

Navarregovernment (EUR 50 million (USD 56.7m))





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

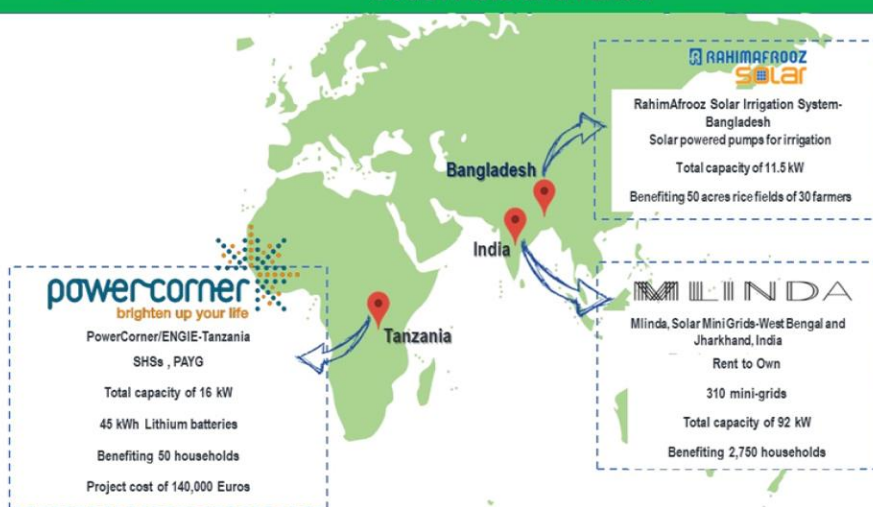


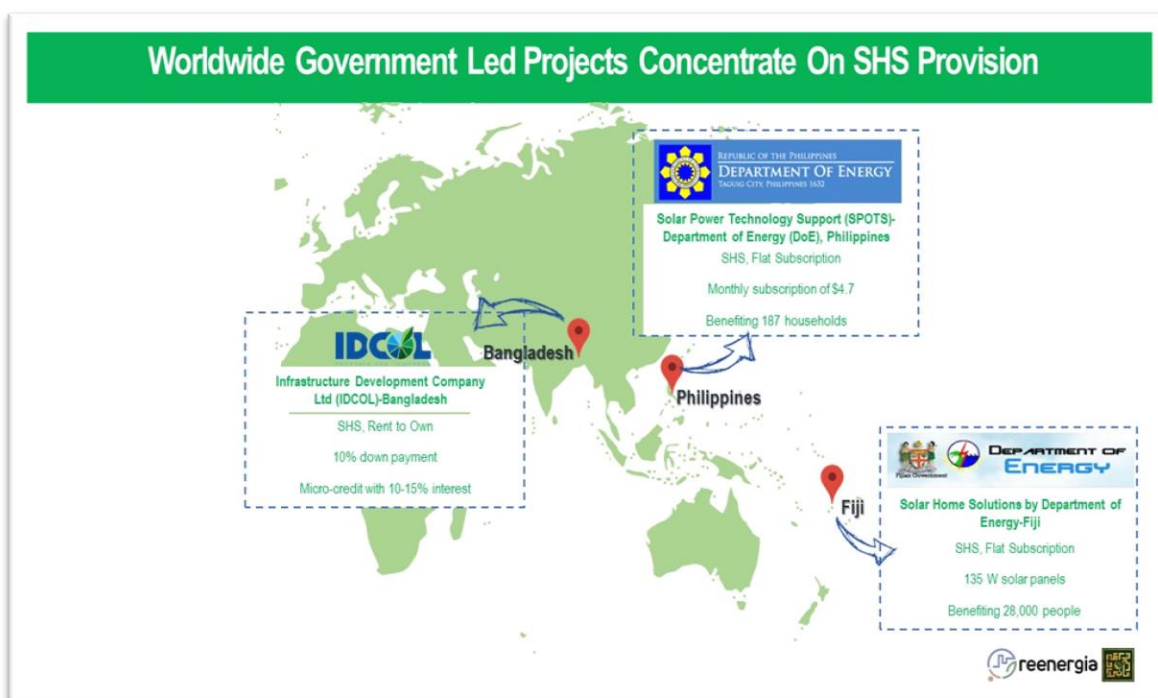
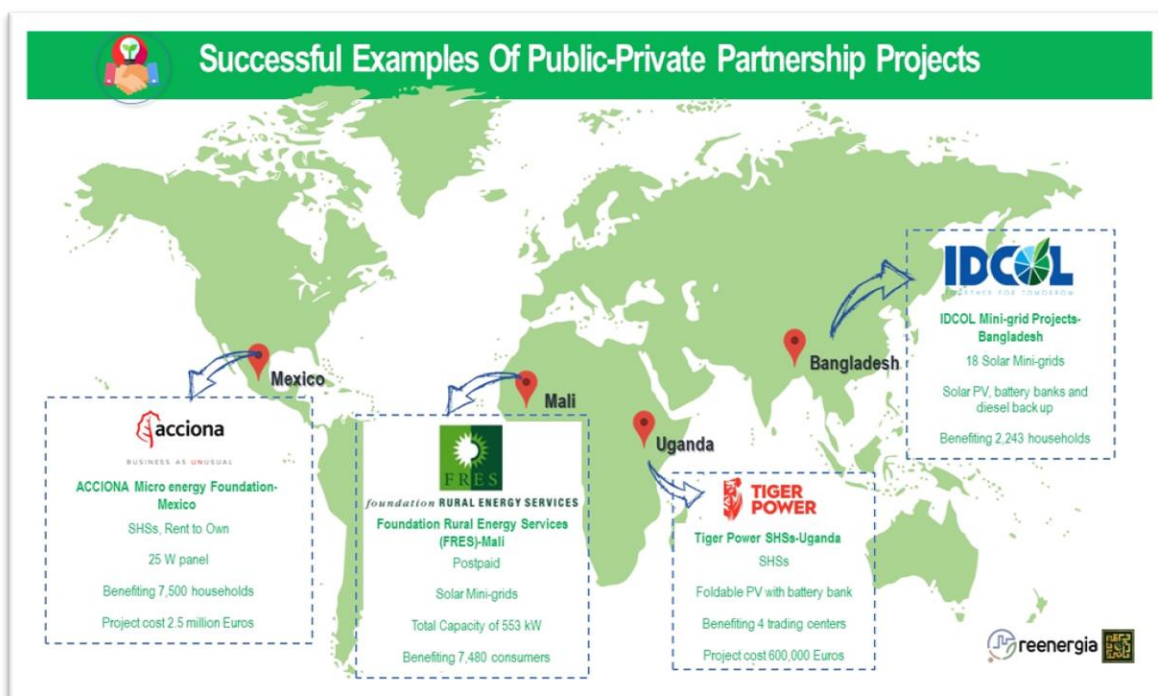
Global Off Grid Renewable Energy Projects

Private, Public and PPP led DG Projects



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



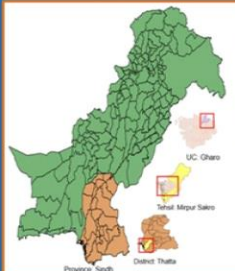




A Case Study of Pakistan's Off- Grid Distributed Generation Models

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

Covering North and South...



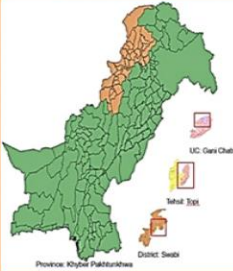
Province: Sindh
District: Thatta

UC: Ghans
Tahsil: Mirpur Sakri
Village: Manjo Samra
Village: Jaffer Jakhro
Village: Jhagga Jakhro



Province: Sindh
District: Thatta

UC: Ghans
Tahsil: Mirpur Sakri
Village: Jaffer Jakhro
Village: Jhagga Jakhro



Province: Khyber Pakhtunkhwa
District: Swat

UC: Gera Chah
Tahsil: Datta
Village: Datta



Province: Khyber Pakhtunkhwa
District: Larkana

UC: Ahmed Khel
Tahsil: Larkana
Village: Hazar Khel
Village: Mulla Khel

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



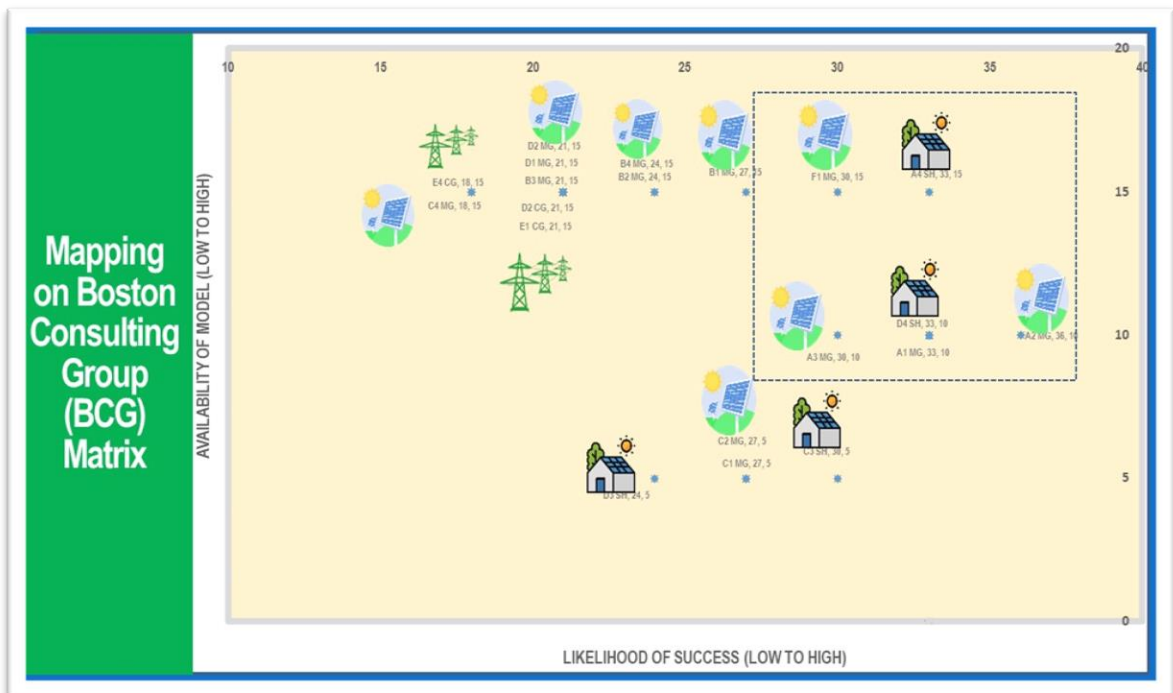
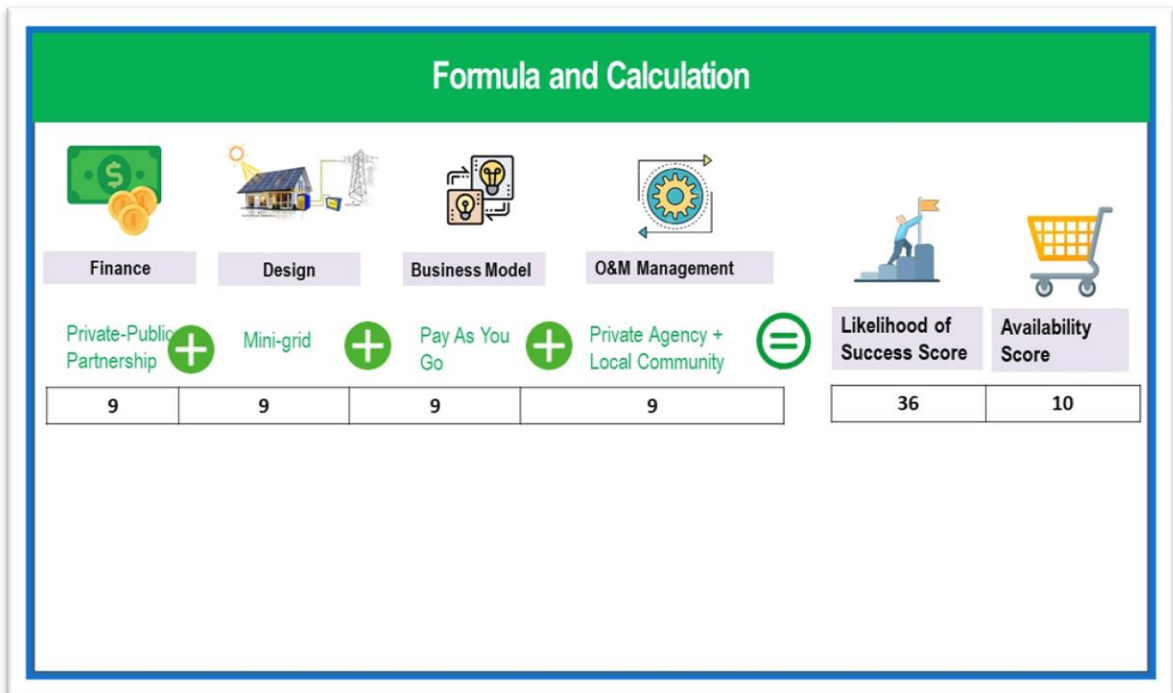
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10



15



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

