Second Webinar on roadmap for comprehensive framework for insurance of solar projects

P K Dash

INTERNATIONAL SOLAR ALLIANCE

18th Nov 2020

Objectives

The Paris Agreement:

- *"Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels"*

The Preamble of ISA framework of agreement:

- *"To undertake joint efforts required to reduce the cost of finance and the cost of technology,*
- ***To mobilize more than US$ 1000 billion of investments needed by 2030 for massive deployment of solar energy"***

Goals

ISA to devise a viable model to remove barriers of investment in solar projects and to attract more capital investment in solar sector in ISA member countries

To prepare a comprehensive and viable insurance policy to cover all risks in solar projects

To bridge the gaps between market demand and insurance coverage, in order to provide risk free investment eco system

Recent Innovations in Solar Technology

01

Flexible Solar PV
Solar films printed in rolls, opens new possibilities of placing solar in different places

02

Solar PV Tracking system
Increases output by 30%-50% and gives more firm power

03

Tandem/ Hybrid Solar cells
Stacks of individual cells, that each selectively convert a specific band of light into electrical energy

04

Perovskite Solar cells
Discovery of mineral with high light absorbing capacities

05

Bifacial Solar panel
Solar cells designed to generate power from both surfaces

06

Advanced Silica based Solar cells
Various High efficiency technologies like PERC, PERL make 500W modules available

07

Robotic / waterless cleaning system
Various dry-cleaning systems developed to save the water in cleaning of modules

08

Solar PV-Thermal systems
Solar PV panel combined with a cooling system increase PV efficiency and use of heat for various applications

09

Heterojunction (HJT) solar panel
Thin amorphous silicon layers on monocrystalline wafers allows higher efficiencies

Recent Technological Innovations in Solar industry

Innovations in Solar Applications

- Floating Solar
- Building Integrated PV (BIPV)
- Agrophotvoltaic (APV)
- Solar Water purifiers
- Vaccine Refrigerators
- Solar Desalination
- Solar Food Cold Chains

Battery storage system

- Lithium Ion- Various battery chemistries such NMC, LFP, LFI etc.
- Iron-flow Battery
- Solar home systems
- Solar Driers
- Solar powered boats

Project structuring/ Innovative Contracting

- Solar Parks
- Round the clock RE Power

ISA Demand Aggregation

22.4 GW of aggregated demand of Solar power leading to USD 12.6 Billion

	No of participating member countries	Demand Aggregated (in GW)	Project Pipeline (USD Billion)
Solar Applications for Agriculture Use (Solar Water Pumping System)	22	1	0.4
Solar Rooftop	11	1	0.4
Solar Mini-Grids	9	10	4.3
Solar Parks	5	1.3	0.4
Solar Home Systems	53	9.4	7.1#

Assuming $150 per SHS of 200-Watt capacity

First ISA Webinar (17th Sept)

Observations

- Indian insurance sector participated to provide key policy advocacy through ISA platform
- MIGA highlighted the schemes on non-commercial risks faced by countries for solar projects viz. Transfer and convertibility, Breach of contract, Expropriation of assets and Civil disturbance/Terrorism
- Other panellists identified challenges for Solar projects as Technology disruption, Module warranty and performance guarantee, Irradiation and Natural calamities, Force majeure, Contractual failure of PPAs and geopolitical risk etc.
- SBI has set aside around Rs 1bn for lending to renewables in 2020 with benefits concession on Card Rate, better Debt: Equity ratio etc.

Recommendation:

- Support from international reinsurance agencies, Governments and Regulatory authorities
- Standardisation of modules and Insurance covers to mitigate shortfall in solar irradiation
- Division of insurance cost between seller, Contractor, Developer and User by allowing pass through of insurance costs
- Indian Insurance Regulatory Authority expressed the need for a study group under its aegis
- The Secretary, MNRE and Secretary, Financial Services, GOI promised support of Indian Government to ISA for achieving the goal.
- Further discussion on critical issues relating to insurance of solar projects

Solar Insurance Products in India

	PV Module warranty/ performance	Solar Panel Warranty	Energy shortfall (solar irradiation)	Energy shortfall
Cholamandalam MS GICL			✓	
HDFC Ergo GICL	✓			✓
ICICI Lombard GICL		✓		
IFFCO Tokio GICL	✓			
The New India Assurance Company Ltd.	✓			

Source: Ministry of New and Renewable Energy, India

Critical risks in solar projects

- Improper installation of the solar plant
- Unintentional error in calculations of the projected performance
- Defect or underperformance of the solar installation or PV module
- Lower than normal solar radiation or natural calamity, force majeure
- Expropriation and political risk
- Currency inconvertibility/volatility
- Substantial change in duties and taxes on imported equipment and changes in PPAs after installation
- Contractual failure to pay in time by the Discoms/agencies purchasing power

All-India Survey of Photovoltaic Module Reliability-2018

Important observations

- PV modules in different climates degrade differently and Modules in the Hot zones degrade distinctly faster. (zones into two broad categories: ‘Hot’ zones (comprising the Hot & Dry, Warm & Humid, and Composite zones), and ‘Non-Hot’ zones (comprising Moderate, Cold & Sunny and Cold & Cloudy zones).

- The Linear Degradation Rate for Young modules is higher than that for Old modules. (The quality issues seen especially in the young modules due to aggressive pricing and timelines and improper handling/installation).

- There is wide variability in the quality and degradation rates of the modules.

- Although most modules available in the market carry the IEC certification, it should be noted that this does not guarantee that the module will perform adequately through its intended life.

Dupont’s global field inspection report

Important Observations

- 3 GW capacity (>550 installations) were visited across the globe to inspect modules
- Modules are showing high visual defect rates (~30%). Most defects are attributed to cells and backsheets.
- Backsheets are showing a higher percentage failure amongst visible module defects – which can have consequences on the power degradation and plant safety.

Real concerns in insurance of solar sector

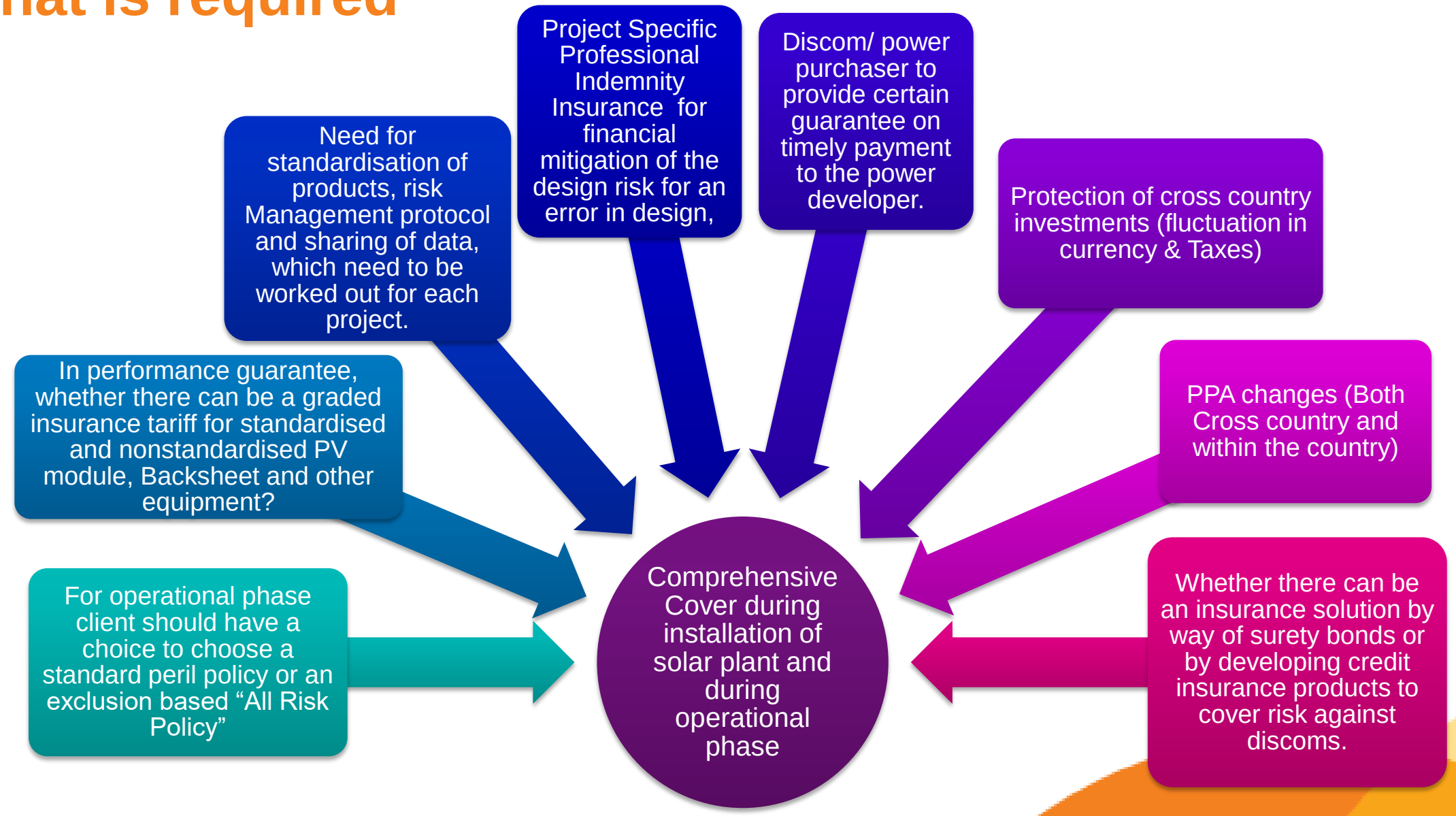
- To cover solar irradiation, natural calamity etc in cost effective way both for the insurer and the developer.
- To bifurcate the performance risk associated with cells/modules of nonstandardised category, whose products are more prone to failure and/or accelerated degradation.
- If the sub-standard modules proliferate in the market, it can also cause real harm to the global solar industry, its reputation with customers and with governments.
- There is need for standardisation of products, test methodology and risk management protocol.
- The re-insurers impose so many exclusions that these policies are not viable for the developer.
- Clear cut division of the responsibility of Seller of equipment, Buyer or Developer and EPC Contractor and user, need to be spelt out.
- Insurance solutions for Discoms for the contractual failure to pay to power developers
- Insurance backing for the performance of the contractors.

What is required

Cover for Product Warranty and Performance guarantee:

- In case the manufacturer has gone insolvent, PV warranty Insurance - Sales & Buyer(S&B) cover is required for 25 years.
- There is need for double trigger: the manufacturer against warranty claims and the buyer in case manufacturer goes bankrupt.
- Product warranty coverage enhances the credit worthiness of projects, and supports more favourable financing terms from lenders, resulting in the premium being offset by the savings from lower debt costs.
- In view of very long tenure of cover (25 years), insurance cover available need not be expensive.
- Need for no-claim bonus may be considered in the policy
- Indian Insurance regulator and development authority has proactively worked on this and has already approved sales and Buyer cover by Munich Re or other A rated reinsurer.

What is required



Roadmap for developing affordable risk premium regime

International Solar Alliance intends to propose a 3-step strategy to develop affordable risk premium regime for solar projects in ISA member countries

1

ISA shall aggregate demand for solar projects in member countries and shall conduct tripartite meetings with policy makers, regulatory authorities and insurers to bridge the gap in solar insurance and develop risk management and quality control procedures

Demand Assessment

2

ISA shall form a consultative group with all stakeholders including policymakers, insurers, reinsurers, insurance agents, financiers, EPC players and OEMs to prepare region/ country specific action plan

Action Plan

3

ISA solar insurance task force will develop a model Insurance package for ISA member countries to provide comprehensive, viable and affordable insurance product portfolio

Implementation

Thank you

International Solar Alliance Secretariat
Surya Bhawan
National Institute of Solar Energy Campus
Gwal Pahari, Faridabad-Gurugram Road
Gurugram, Haryana, India

Annexures

Insurance products for Solar projects (1/2)

Insurance Company	Chola MS General Insurance	HDFC ERGO General Insurance	
Product Names	Chola Solar Plant Protect Policy	Solar Panel Warranty Insurance	Solar Energy Shortfall Insurance Policy
Risks covered	• Shortfall in deemed energy production	• PV Modules Performance	• Solar energy shortfall
Covered cause of risks	• Lack of adequate solar irradiation	• Performance warranty & Product warranty of PV Modules	• Unintentional error in calculation of target production • Actual solar radiation that is less than assumption
Coverage period	• Maximum 1 year from policy commencement	• Duration - 12 months, indemnity period upto 25 years	• Policy duration- Maximum 1 year
To Seller for Sold Equipment	N.A.	• Losses with regards to Performance warranty & Product warranty offered by manufacturer to the Developer	N.A.
To Buyer for Procured Equipment	N.A.	• Claim of buyer in the event of manufacturer's insolvency	N.A.

Insurance products for Solar project (2/2)

Insurance Company	ICICI Lombard	New India Assurance
Product Names	Solar Panel Warranty Insurance	New India Solar Energy Insurance Policy
Risks covered	• Decrease in power output below the insured level • Add on Policy for Solar Park Contractual Obligation for Underperformance	• PV Modules Performance • Product Warranty
Covered cause of risks	• Decrease is power output due to Faulty Manufacturing, Material Defect and/or Material Ageing • Warranty Provider fails or has failed to honor its remedy obligations under the Warranty Conditions due to insolvency	• An unforeseen decrease in power output of the Actual Module Performance below the insured module performance • Resulting from PV Modules being defective due to the specified defects
Coverage period	• Maximum 1 year from policy commencement and can be renewed	• 1 year from policy commencement and can be renewed
To Seller for Sold Equipment	• PV Module Performance • Solar Park Performance Contractual obligations (cost not more than 25% of the indemnification for Performance Warranty	• PV Module Performance Warranty • PV Module Product Warranty
To Buyer for Procured Equipment	N.A.	• Applicable if the insured (The Seller) has entered into a Buyers Policy • Buyers shall be the beneficiaries in case of the insolvency of the Insured

Annexures - Demand Aggregation of Solar Water Pumps

Total Demand aggregated from 22 countries: **272,579 pumpsets**

S.No.	Country	Demand
1	Benin	50, 000
2	Democratic Republic of Congo	80,000
3	Djibouti	100
4	Mali	15,000
5	Mauritius	27
6	Niger	15,000
7	Senegal	4,000
8	Somalia	500
9	South Sudan	6,800
10	Sudan	50,000
11	Uganda	30,000
12	Cabo Verde	100
13	Zambia	6
14	Togo	5,000
15	Fiji	27
16	Tonga	258
17	Tuvalu	10,000
18	Sri Lanka	2,000
19	Yemen	1,500
20	Nauru	400
21	Guyana	111
22	Peru	1,750

Demand Aggregated as on Dec 31st 2018

Annexures - Demand Aggregation of Solar Rooftop

S.No.	Country	Demand (MW)
1	Cape Verde	4.5
2	Democratic Republic of Congo	1012.8
3	Cuba	10.4
4	Guinea	1
5	Malawi	1.6
6	Nauru	2.2
7	Sudan	4.4
8	Tonga	1
9	Tuvalu	5
10	Guinea-Bissau	6.5
11	Zambia	1.5
	Total	**1,050.9**

Demand Aggregated as on Dec 31st 2018

Annexures - Demand Aggregation of Solar Mini-Grids

S.No.	Country	Demand (MW)
1	Democratic Republic of Congo	10,400
2	Cuba	0.01
3	Guyana	1.63
4	Malawi	2.8
5	Sri Lanka	3.73
6	Sudan	46.06
7	Tonga	1.01
8	Guinea-Bissau	5
9	Zambia	2.5
	Total	**10,463**

Demand Aggregated as on Dec 31st 2018

Annexures - Demand Aggregation of Solar Parks & Solar Home Systems

S.No.	Name of the Country	Demand (MW)
1	Mali	500
2	Togo	500
3	Sudan	200
4	Malawi	100
5	Mozambique	30
	Total	**1,330**

For Solar Home Systems, from 53 countries, 47 million Solar home system demand has been estimated, basing upon world bank report