Public Financing Models for Grid-connected Solar in India: A World Bank Perspective

SOUTH ASIA SUSTAINABLE DEVELOPMENT ENERGY

THE WORLD BANK

THE FUTURE OF SOLAR ENERGY IN INDIA

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Widespread commercial lending missing despite downstream public financing through FiTs

- Solar PV and CSP development in JNNSM Phase-1 seeks around USD 2 billion of investments; USD 1.4 billion of debt
- Only few participating SCBs with combined debt market share of less than 30%; US EXIM estimated to have sanctioned USD 480 m loans under Phase-1 and Gujarat policy
- Financing of most solar projects limited to full recourse and at higher rates than conventional projects; SCB lending restricted to large corporates and developers with scale
- Consortium lending by Indian lenders for even 5 MW project sizes led to substantive time and effort in financial closures

Upstream public financing, through DFIs, hasn't made much impact either

Development Financial Institution	Financing Products	Actual Participation in solar sector in India
OPIC (Requires US Company involvement)	Direct Loans to Projects, Loan Guarantees to Lenders, Export Credit Insurance and Working Capital Guarantees to Lenders.	Direct lending to 6 PV projects under JNNSM & Gujarat state solar scheme – concessionary & Libor linked, long-tenor
IFC: Private financing – World Bank group	Include equity & debt financing, investment funds, and risk products	Direct lending to 5-6 PV projects (JNNSM & Gujarat state solar scheme) – long-tenor, Libor linked
ADB: Developmental & Private Financing	Include financing facilities for intermediaries as well as projects, and risk products	Direct lending for a solar thermal project; structured a USD 150 million partial Credit Guarantee (PCG) for lenders
GiZ/KfW: Developmental Financing	Include export financing, Lines of Credit, and grants	Focus on industrial solar applications & Distributed Generation under JNNSM

Defining roles and objectives of providing public finance critical

- Efficacy in terms of "Buying down" tariffs vis-à-vis addressing structural impediments to financing
- Leveraging, and not crowding out, commercial financing towards a sustainable and self-rolling market
- Facilitating and supporting appropriate technology development
- Bettering entire ecosystem development for parallel commercial lending

3,600 MW of solar only under JNNSM Phase-II would require around USD 6.4 Billion, and have a debt financing requirement of around USD 4.5 billion

An analytical comparison of past and proposed public funding mechanisms for solar PV

Options for public finance	Funding Instrument / Mechanism	Extent of Budgetary support / MW	Key additional benefit	Key criticism
Buy-down cost of solar by financing incremental costs	Capital Subsidy / Viability Gap funding	~ USD 85,000	Direct impact on tariff; Reduces capital exposure of lenders	Not appropriate for commercial technologies: low emphasis on actual performance
	Generation-based incentive	~ USD 89,000	Output linked; Incentivizes developers and efficient equipment suppliers	Extends government support over the entire project life-cycle
Address or cover specific risks perceived by commercial lenders and impediments to optimal financing	Interest Subvention	~ USD 81,500	Draws commercial banks into lending; reduces cost of finance	As concessional finance is limited, it effectively translates into subsidy
	Sub-ordinated Public Finance to prolong loan tenor	**~ USD 14,800**	**Recoverable credit, draws commercial lending; due diligence by commercial lenders**	**Financing delays on account of combined lending; requires larger upfront commitment**
	Credit Guarantee / Enhancement	~ USD 68,500	Contingent exposure and can leverage investments with zero or limited public funding	Propensity for free-riding & moral hazard by financiers / Distribution companies

While CSP requires an even more careful approach in deploying public finance

Develop Demonstration Projects

- Using public finance with desirable technology features such as storage, air-cooled condensation, and hybridization
- Tap into concessional funding, such as Clean Technology Fund or other multilateral and bilaterals

Public Private Partnership Model

- Bidding with specific technical specification and deterministic approach with site identification, preliminary activities and techno-commercial feasibility completed by a public-sector entity
- Analyze development in manufacturing value chain & explore need for coordinated industrial policy actions and eco-systems development plans to indigenize areas of solar thermal manufacturing

Gather lessons from Phase II projects: Decide on desirable technology standardization & incorporate them into grid-connectivity standards

Private-led model

- Evaluate shift to project allocation on a purely private model and competitive bidding

Phase -II

Phase -III

A few takeaways and suggested way forward

- Critical to evaluate public financing mechanisms: short-term buying down of solar power cost vis-à-vis addressing long-term structural impediments
- Public finance should not crowd out commercial lending, but also not impede technology deployment and diffusion due to lack of public support
- Sub-ordinated Public Finance to provide loans with prolonged tenor (where the commercial lender gets repaid first) seems to offer the maximum impact on a per MW basis and leveraging commercial lending
- CSP requires a careful public funding approach in terms of more project upfront project preparation, technical assessment of bidders, and following a Case-2 approach

Thank You

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