

This study explores how the public sector catalyzed commercial financing for grid-connected solar projects in selected developing countries. It analyses the linkages between global and country-specific factors bringing out the complexity of the choices that decision makers face and their rationale for pursuing a specific course of action. This study aims to offer a useful perspective to governments and development partners on their efforts to attract non-concessional sources of financing in the solar market.

CONTEXT

Grid-connected solar projects, using technologies such as Solar Photovoltaic (PV) and Concentrated Solar Power (CSP), have several advantages, such as diversifying the energy mix, reducing exposure to fossil fuel price volatility, and decreasing greenhouse gas emissions.

However, deploying these technologies comes with a high price tag and relying solely on concessional public resources to deploy them may not be a sustainable long-term development pathway. Yet, the public sector plays an important role in attracting commercial investors and capital to the sector.

KEY FINDINGS

1 Due to decreased technology risk, accelerated deployment, and lower costs, public financing for solar PV plants is not critical.

Given the commercial maturity of the market, solar PV plants can now be developed on commercial terms, worldwide. On the other hand, the CSP market is nearing maturity. Once markets fully monetize the full value CSP brings to the electricity system (including its contribution to grid stability), its penetration will increase, making it more competitive and obviating the need for public investment there, too.

2 The public sector should invest in grid infrastructure, especially for solar PV deployment.

The scale-up of grid connected solar power projects requires public investment in automated control centers, transmission infrastructure, regional power interconnectors, and energy storage systems. Optimal solutions will vary across countries.



QUICK FACTS

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RELEVANT CIF PROGRAM

Clean Technology Fund (CTF) and Scaling Up Renewable Energy Program in Low Income Countries (SREP)

EVALUATION FIRM

The World Bank, through funding provided by the Climate Investment Funds (CIF), the Energy Sector Management Assistance Program (ESMAP), and the Public-Private Infrastructure Advisory Facility (PPIAF)

RELEVANT COUNTRIES

Chile, India, Maldives, Morocco, the Philippines, Senegal, South Africa

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3 **The capacity of key institutional stakeholders should be strengthened.**

Most developing countries need to build institutional capacity and strengthen the technical and operational management of grid operators, regulators, power sector planners, and state-owned utilities to face the challenges associated with the scale-up of solar power. Regulators and policy makers need to keep abreast of the development of solar technologies, their applications, and benefits, to design fit-for-purpose responses that would maximize the value added and attract commercial interest.

4 **Governments' plans and policies should offer long term predictability.**

Commercial investors closely follow the development of potential project pipelines and upcoming procurement processes – sudden policy reversals can erode market confidence and lessen the likelihood of financing future programs.

5 **Governments should undertake reforms to ensure the financial sustainability of power utilities.**

Solar deployment can be supported by credit enhancement mechanisms, such as guarantees in the short-to-medium term. However, the extent to which such mechanisms can be sustained over time is limited by fiscal constraints and budgetary restrictions. Sector reforms should be undertaken to reduce the reliance on government guarantees in the long-term.

FORMS OF PUBLIC SECTOR INTERVENTIONS

Direct and indirect financing

Direct financing encompasses concessional loans, grants from governments and equity investments for which the return is below the level required by commercial investors. Typically, indirect financing refers to fiscal and financial incentives provided by a government to market investors.

Legal, policy and regulatory framework

This comprises laws, policies, regulations, and guidelines governing private investment in renewable energy in general, and solar in particular.

Planning, technical, and operational capacity

This encompasses integrated generation, transmission and grid integration planning, solar development zoning, and grid operational management and it affects the extent to which national actors can introduce, expand, and maintain the stability of solar deployment in the power sector.

Government-sponsored guarantees

These refer to commitments made by sovereign entities to compensate commercial investors for payment defaults due to the failure by state-owned organizations to honor their contractual obligations.

Investment in enabling infrastructure

This refers to major capital expenditures, excluding investments in solar plants, undertaken by the public sector to facilitate the development of solar projects.

COUNTRY EXAMPLE

MALDIVES: SMALL POWER SYSTEM AND DISPERSED GEOGRAPHY



Maldives is one of the world's most geographically dispersed countries, with 1,192 islands spread over an area of 115,300 square kilometers. Electricity production from solar resources increased significantly in the last decade, however, private sector led solar investments outside the resort islands are still limited. In 2016, the government of Maldives launched the Accelerating Sustainable Private Investments in Renewable Energy

(ASPIRE) program, aimed at encouraging private sector investment in the renewable energy sector. The program yielded its first successful project in 2018: a 1.5 megawatt solar rooftop facility on the island of Hulhumalé.

A government-backed guarantee from the World Bank and a payment liquidity facility prefunded through a grant from the Scaling-Up Renewable Energy Program, were critical to the successful procurement of the project. The example of Maldives reveals that during the early market deployment stage and in the presence of financially weak state owned single-buyer off-takers, governments need to support guarantees and other liquidity facilities to mitigate the risk of nonpayment.

Building on the lessons learned from the first bidding process, the government of Maldives has launched a second round of tender under the ASPIRE program, laying a firm foundation for commercial investment in the Maldives solar market. In the short-to-medium term, capacity building for generation and transmission planning and grid integration studies are needed to reduce uncertainty about grid absorption capacity and determine operational and investment needs. The government is keen to promote the development of solar hybrid systems combined with energy storage solutions. In parallel, encouraging knowledge exchange and cooperation with other island countries further strengthens institutional capacity.