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Deutsches Institut für
Entwicklungspolitik

German Development
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Rent management trade-offs

The case of India's National Solar Mission

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2. Jawaharlal Nehru National Solar Mission: becoming a "global hub for solar"
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India's energy situation and solar potential

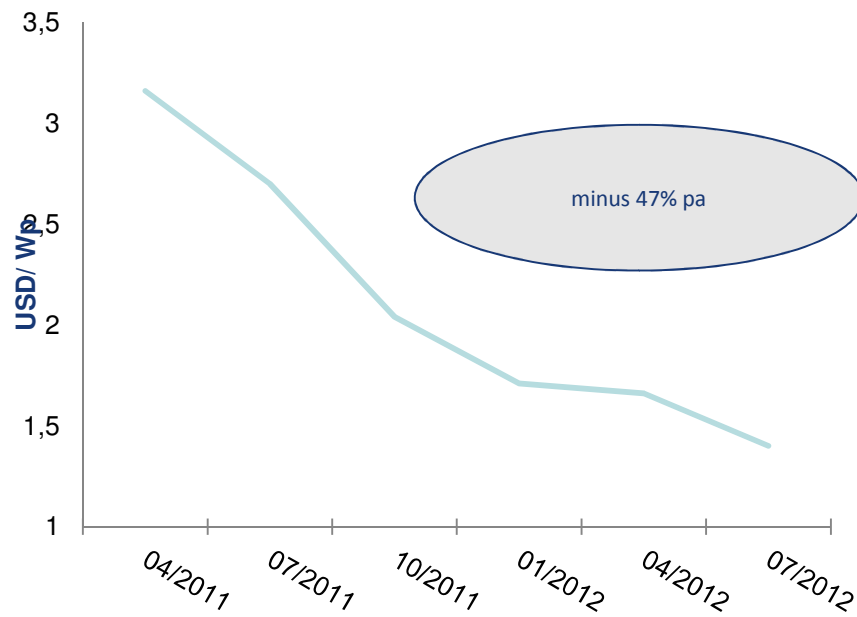


- Significant energy challenges:
 - Power deficit in 2009 was 11%
 - 40% of population (over 400 million people) with no access to electricity
 - Weak financial and technical status of many utilities

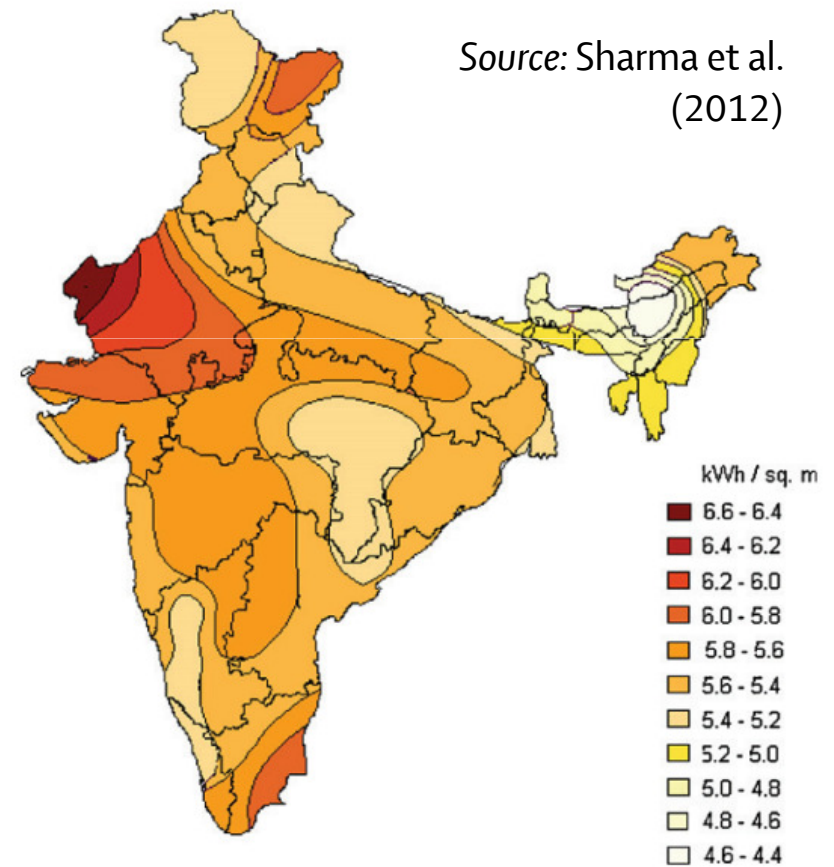
- Dual pressures to avoid fossil fuels:
 - Internal: huge burden of continued high dependence on fossil fuel imports
 - External: international pressure to grow in environmentally sustainable way



➤ Solar energy is promising alternative to fossil fuels:



Source: Altenburg and Engelmeier (2012)





- Despite potential, India's solar energy resource remains largely untapped

- Negligible solar energy generation in 2010:
 - 105.9MW of solar PV
 - 177GW of total electricity generation capacity



Jawaharlal Nehru National Solar Mission:

becoming a “global hub for solar”



“We will pool our scientific, technical and managerial talents, with sufficient financial resources, to develop solar energy as a source of abundant energy to power our economy and to transform the lives of our people. Our Success in this endeavour will change the face of India. It would also enable India to help change the destinies of people around the world.”

Source: Prime Minister Singh in GoI/MNRE (2010)



Creating enabling policy framework for deployment of 20GW by 2022

Use RPOs and preferential tariff to ramp up capacity of grid-connected solar power generation to 1GW by 2013 and an additional 3GW by 2017

Create favourable conditions for solar manufacturing capability

Promote programmes for off grid applications, reaching 1GW by 2017 and 2GW by 2022

Achieve 15m m² solar thermal collector area by 2017 and 20m by 2022

Deploy 20m solar lighting systems for rural areas by 2022

Source: GoI/MNRE(2009)



Creating enabling policy framework for deployment of 20,000MW by 2022

Use RPOs and preferential tariff to ramp up capacity of grid-connected solar power generation to 1GW by 2013 and an additional 3GW by 2017

Create favourable conditions for solar manufacturing capability

Promote programmes for off grid applications, reaching 1GW by 2017 and 2GW by 2022

Achieve 15m m² solar thermal collector area by 2017 and 20m by 2022

Deploy 20m solar lighting systems for rural areas by 2022

Source: GoI/MNRE(2009)



- **Phase 1:** pilot phase to would guide first 1GW of installations
 - For PV, Phase 1 was split into two batches with developers in each batch being given 1 year to commission their plant after the contract had been awarded
 - The first batch was commissioned in January 2012 and the second batch to be commissioned in January 2013
 - For CSP, Phase 1 consisted of only one batch, with developers being given 2 years (early 2013) to commission their plant after contract approval
- **Phase 2:** consolidating the achievements of Phase 1 by directly supporting a further 3GW and leveraging another 6GW between 2014-2017.
- **Phase 3:** scaling up to install another 10GW over 5 years, between 2017-2022.



Looking at the Solar Mission through the lens of rent management



- Why look at Solar Mission through lens of rent management?
 - **Auction-based tariff** used to determine the level of policy rents
 - **Local content requirements (LCRs)** distributes rents between local and foreign manufacturers.

- Note: Analysis focuses on solar PV technology

Determining the right level of rents through auctions



- CERC proposed initial 25-year feed-in tariff of 0.27 €/kWh for PV
- Overwhelming interest, particularly in PV, led to **competitive reverse bidding**
- In Phase 1:
 - Batch 1: 150MW of PV projects offered, max project size of 5MW, average bid of 0.19 €/kWh
 - Batch 2: 350MW of PV projects offered, max project size of 20MW, average bid of 0.14 €/kWh
- Safeguards:
 - bidders to pay a bidding fee and give bank guarantees, which they lose in the case of delays.



Determining the right level of rents through auctions



- First glance suggests reverse auctions were very successful
 - Low bids reflected strong international trend of falling PV module prices
 - Technical capabilities were important – previous experience in auctions helped
 - Delays were penalised and safeguards were properly employed
 - Set to meet target of 500MW of grid-connected solar PV installations

- However, doubts remain:
 - Concern over low viability of projects at such low prices
 - Concern over quality
 - Lag-time in discovering impact



Distributing rents between manufacturers through local content requirements



- Projects benefiting from preferential tariff under the Solar Mission were subject to **local content requirements (LCRs)**
- For PV:
 - Batch 1: projects using crystalline silicon had to use modules manufactured in India
 - Batch 2: projects using crystalline silicon had to use cells and modules manufactured in India
 - Projects using thin-film technology were exempt



Distributing rents between manufacturers through local content requirements



➤ "Perverse support" for thin film PV technology

- Cheap US Exim Bank finance conditional on use of thin film from US
- Solar Mission Batch 1: 50% TF and 50% CSI
- Solar Mission Batch 2: 59% TF and 41% CSI
- Global distribution: 14% TF and 86% CSI



➤ Manufacturing capacity increased, but capacity utilization decreased

- 0% capacity utilization in cell manufacturing, 10-15% capacity utilization in module manufacturing
- Companies bankrupt or in debt restructuring
- Many job losses

➤ Manufacturers survived by diversifying, or soaking up losses



Trade-offs in rent management



- Clear clash of agendas: cheap versus local
 - Determining right level of rents through auctions
 - Distributing rents between local and foreign manufacturers

- Despite this, the Solar Mission was designed in order to allow opportunity to learn from policy implementation issues in each Phase:
 - LCRs will be adapted in Phase 2 so that it is technology-neutral
 - Auctions were applauded not only for lowering costs, but also ensuring transparency of the process – they will be continued in Phase 2



Conclusions



- Given that managing rents for the green transformation is full of uncertainty, having built-in learning processes is essential.

- Lessons from the Solar Mission :
 - Distributing rents to local manufacturers through LCRs can fail if poorly designed
 - If properly designed and implemented, managing rents through auctions can not only lower costs but also ensure transparency and legitimacy
 - A clearly phased approach helps to embed learning in the policy process
 - Enables policy adaptation based on lessons learned during each phase
 - Prepares stakeholders for potential changes and encourages them to give feedback

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Thank you

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