



Early Lessons Learned from CSP in India

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ADB

Early Lessons Learned from India CSP

- National Solar Mission (NSM)
 - Initiated in 2008, integrated into National Action Plan for Climate Change 2010
 - “home grown” program, little concessional finance
 - Guiding policy document, (for grid and off-grid), long-term commitment (20 GW by 2022)
- The PPP Structure - critical inputs from Government:
 - Sites identified, land acquired, permits ready (time and cost)
 - Water supply (competing demands, time!)
 - Model PPA with NTPC subsidiary (bankability concerns)
 - offtake arrangements (blending of power, govt backstop funding for any defaults)

An Investor's Perspective on Solar

“We believe India is well on track to exceed the government’s 20 GW solar power installed capacity target by FY22-23. This is based on:

- 1. increased foreign investor participation and their willingness to take on exchange rate risks [oops] given diminishing returns from Europe-based solar projects;*
- 2. state-level Renewable Portfolio Obligations (RPO);*
- 3. the mandatory replacement of diesel powered generators with solar to power telecom towers; and*
- 4. rural electrification and other off-grid applications.”*

Source: UBS, *Can money be made from the Indian sun?*, 16 April 2012

Early Lessons Learned from India CSP

- DNI Data
 - 10-20% lower than initial estimates
 - importance and accuracy of on site ground measurements (insolation, wind, turbidity, other conditions)
- NSM Reverse Bidding Process:
 - CSP bids were around 11 rupees/kwh (~22 US cents/kwh) – without concessional funding
 - Flexibility for bidders to figure it out; did this reduce costs? (who reaps the benefits – the EPC contractors, the investors or the consumers?)
 - “Go big or go home” – time, schedule and cost implications
 - 5 of the 7 Phase 1 CSP projects face difficulties in meeting the mandated deadline for commissioning

Early lessons learned from India CSP

- High Capital costs:
 - can CSP compete in India with PV? Utilities prefer dispatchable power
 - Are ancillary services from CSP plants valued in India?
 - Areva: Solar field 30-35% cheaper than 2010, localization of materials (how much is possible with trough? tower?)
- Indigenization – welding skills, local manufacturing of components, mirrors, technology development
- Financing – local banks concerns:
 - technology performance in India, no operating data, goods sourcing issues
 - transmission capacity in western areas
 - Over reliance on corporate guarantees for financing

Conclusions

- Add'l CSP demo projects (e.g., 12h storage, 500 C, dry cooling, hybrid) coming soon – is it too late?
- Industrial applications for CSP (it's not all about power generation)
- Can CSP be scaled to reach “Model T” prices? Or is “Tesla X” price the best we will get?
- Don't forget the **End Game** – in India, solar is about electricity reaching the masses who don't have it (not necessarily global technology development):
 - *ADB loans for public transmission capacity, smart grid*
 - *Multiple private sector PV projects (loan and equity)*
 - *Capacity building with commercial banks, loan guarantees*
 - *Off-grid business models and mini-grid investments*