



# Early Lessons Learned from CSP in India

By Don Purka  
Principal Investment Specialist (Climate Finance)  
Asian Development Bank  
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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*