THE COST AND SHORT-TERM BENEFITS OF LOCAL CONTENT REQUIREMENTS

Evidence from the Indian solar auctions

Benedict Probst, **Vasilios Anatolitis,** Laura Diaz Anadon, Andreas Kontoleon
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Background

- **What** are we analyzing?
  - What is the effect of local content requirements **(LCR) on the bid prices** in the solar PV auctions in India?
  - How successful were the LCR in terms of industrial policy goals?
    - (Competitive) PV manufacturing industry
    - Effective achievements of targets
    - Job creation
- **Why** are we analyzing solar PV auctions in India?
  - Important RE market (target capacity: **175 GW** of RE **by 2022**)
  - Indian auction design allows provides a **quasi-experimental setting (counterfactual)**, since separate LCR and "open category" (OC) auctions took place, often in the same State (and even Solar Park), at the same time
  - LCR increasingly popular instrument, especially in developing countries (e.g. Saudi Arabia, Uganda, Argentina, South Africa)

Background

- **How** are the LCR in India designed?
  - LCR: a certain share of total investment costs or certain parts of the value chain have to be sourced locally, and these requirements can either be strict (e.g. Saudi-Arabia) or impact the score in a multi-criteria auction
  - In India, **cells** and **modules** had to be locally manufactured
  - Raw materials, ingots and wavers could be imported
- **Which time period** are we analyzing?
  - 2014-2017: the second phase (Phase II) of the National Solar Mission (goal: 100 GW of PV by 2022), during which LCR were still eligible
  - In **December 2017**, (direct) **LCR abolished** due to a WTO ruling and deal with the US
  - Phase I had no counterfactual auctions (when polysilicon PV modules were used, LCR had to be followed; not applicable for thin-film technology)

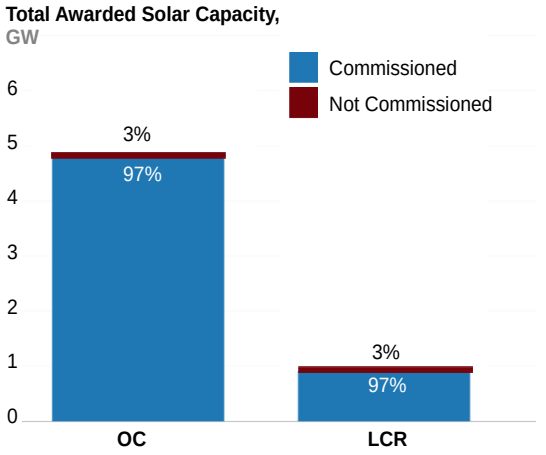
Effects on bid prices and realisation rates

Bid prices

- LCR significantly increase the price of solar power in India
- Average increase between **5.7%-7.1%** compared to Open Category
- Gap between categories **did not decrease over time**
- Experience of bidders leads to the decrease of bid prices

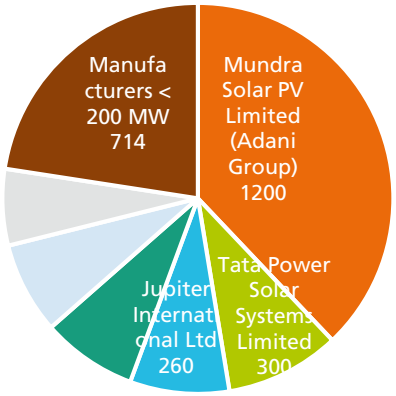
Realisation rates

- LCR can lead to significant delays, such in the case of Brazil, or have a negative impact on the realisation rate of the projects
- In India, we find no difference between realisation rates

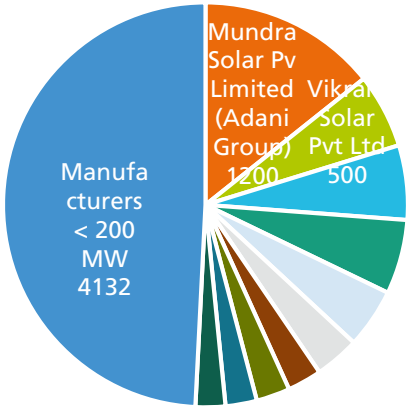


Effects on manufacturing capacities

- Manufacturing capacity shows significant increase from 300 MW/a in 2010 (192 MW/a cell manufacturing) to 8400 MW/a in 2017 (3200 MW/a cells)
- Many producers have a capacity of less than 200 MW/a (the minimum capacity for economies of scale)
- 53% of cell and 65% of module manufacturing capacity currently operational



Cell manufacturers



Module manufacturers

Conclusions

- Increase of bid prices due to LCR regulation by **5.7%-7.1%**
- LCR show no difference in realization rates
- But: unsuccessful in implementing a globally competitive PV manufacturing industry
- LCR policy was not part of a more holistic and long-lasting industrial policy effort
- No integrated manufacturing capacities of companies (only cell and module)
- India should provide more direct financial incentives to manufacturers
- India's new approach:
  - Five 2 GW (total **10 GW**) 25-year PPAs for solar PV projects are auctioned, but with the obligation to build 600 MW of integrated manufacturing facilities (total **3 GW**)

Contact details

Vasilios Anatolitis

Competence Center Energy Policy and Energy Markets

Fraunhofer Institute for Systems and Innovation Research ISI

Breslauer Straße 48 | 76139 Karlsruhe | Germany

Phone +49 721 6809-281 | Fax +49 721 6809-272

vasilios.anatolitis@isi.fraunhofer.de

http://www.isi.fraunhofer.de

Fraunhofer ISI

Vasilios Anatolitis
Fraunhofer ISI
vasilios.anatolitis@isi.fraunhofer.de

AURES II

Website:	http://aures2project.eu/
LinkedIn:	AURES II
Twitter:	@auctions4res
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