

Mini-grids and the Arrival of the National Grid: Case Studies from Cambodia, Sri Lanka & Indonesia

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**With Bernard Tenenbaum
& Dipti Vaghela**

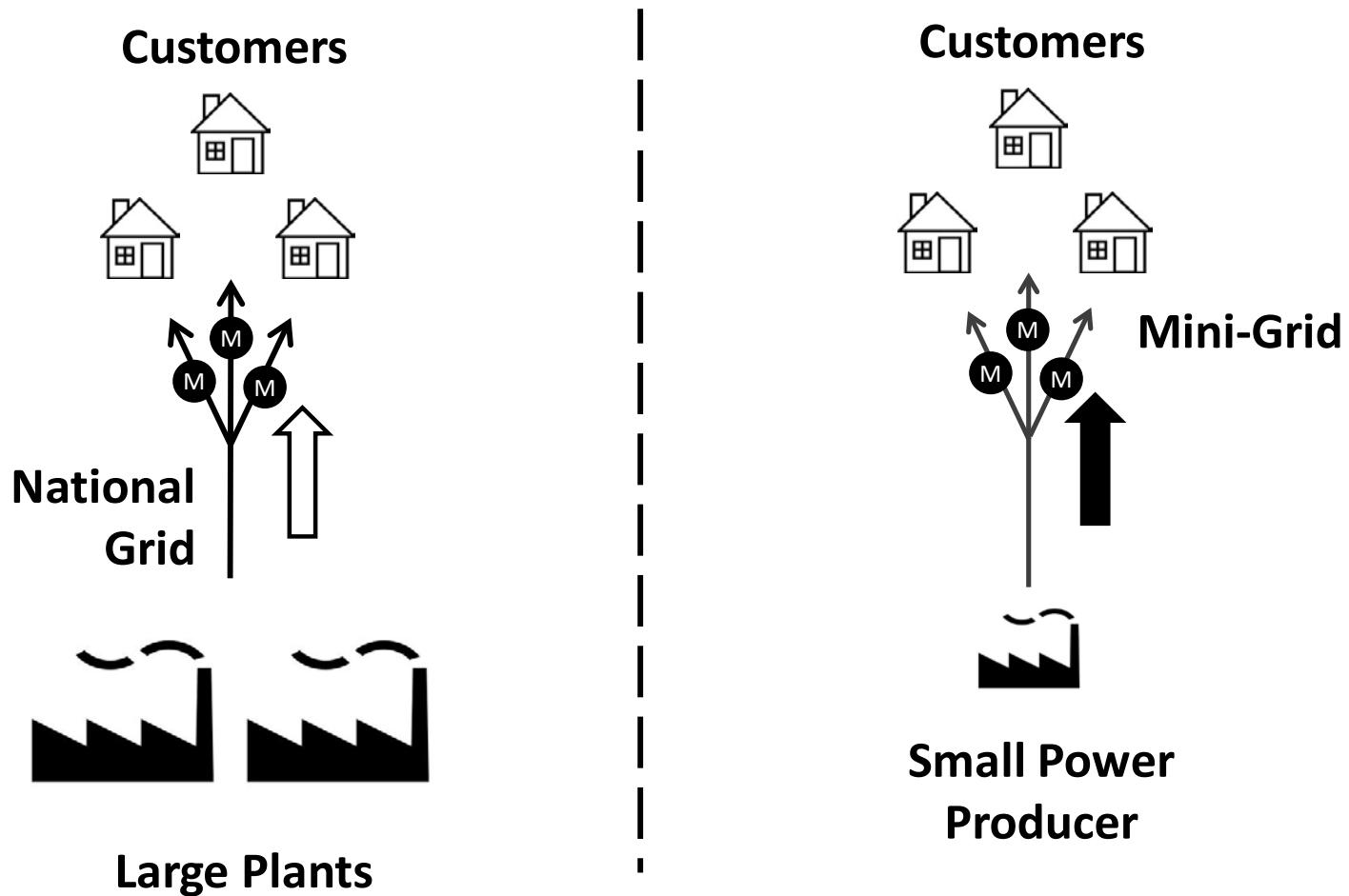
**Up scaling Mini-Grid
Workshop**

Naypyitaw, Myanmar

February 7, 2017



Before the national grid arrives

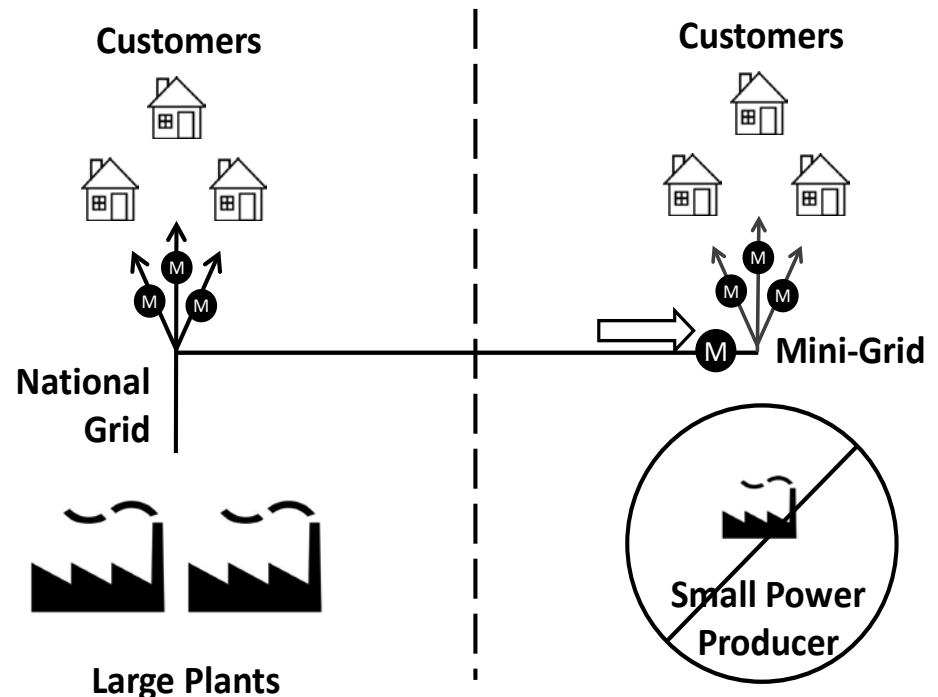


Key: = power from utility = power from SPP = meter

Cambodia: from isolated mini-grids to distribution franchisees

- + >250 mini-grids became distribution franchisees
- + Electricity Authority of Cambodia (EAC) put in place a comprehensive program:

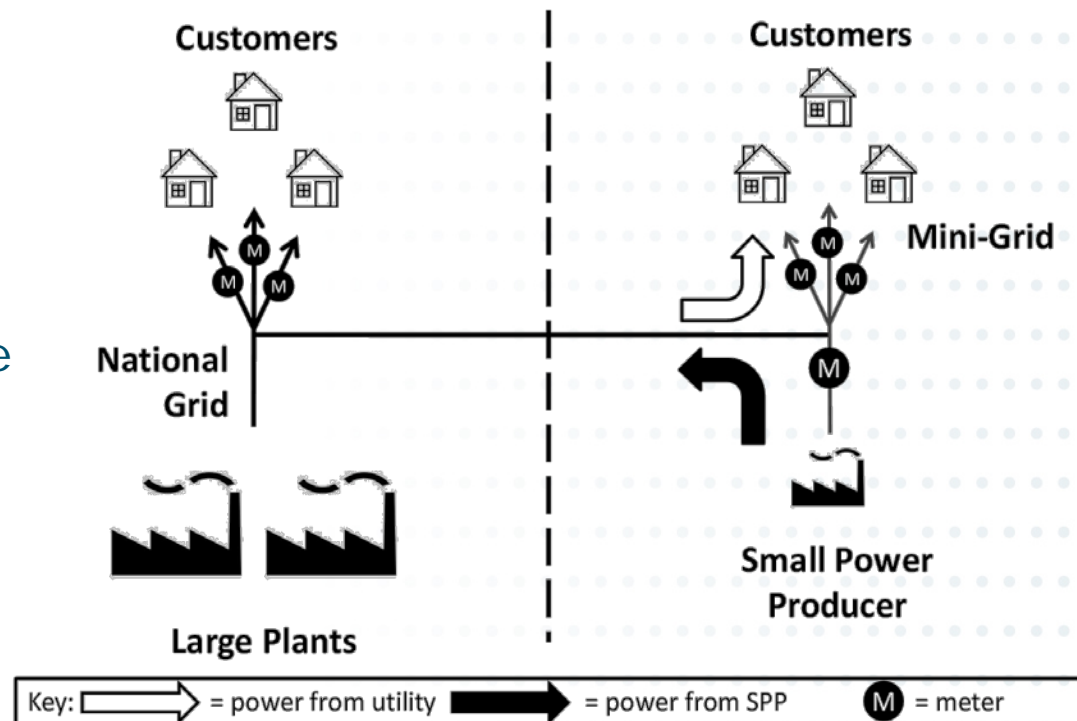
- Long-term distribution licenses required...
To acquire one a mini-grid must:
 - Invest in utility-quality distribution network
 - Extend network thru service territory
 - Grants and loans
- Retail tariffs standardized and subsidized for distribution franchisees.



Key: = power from utility = power from SPP = meter ³

Sri Lanka: from isolated mini-grid to SPP (sometimes)

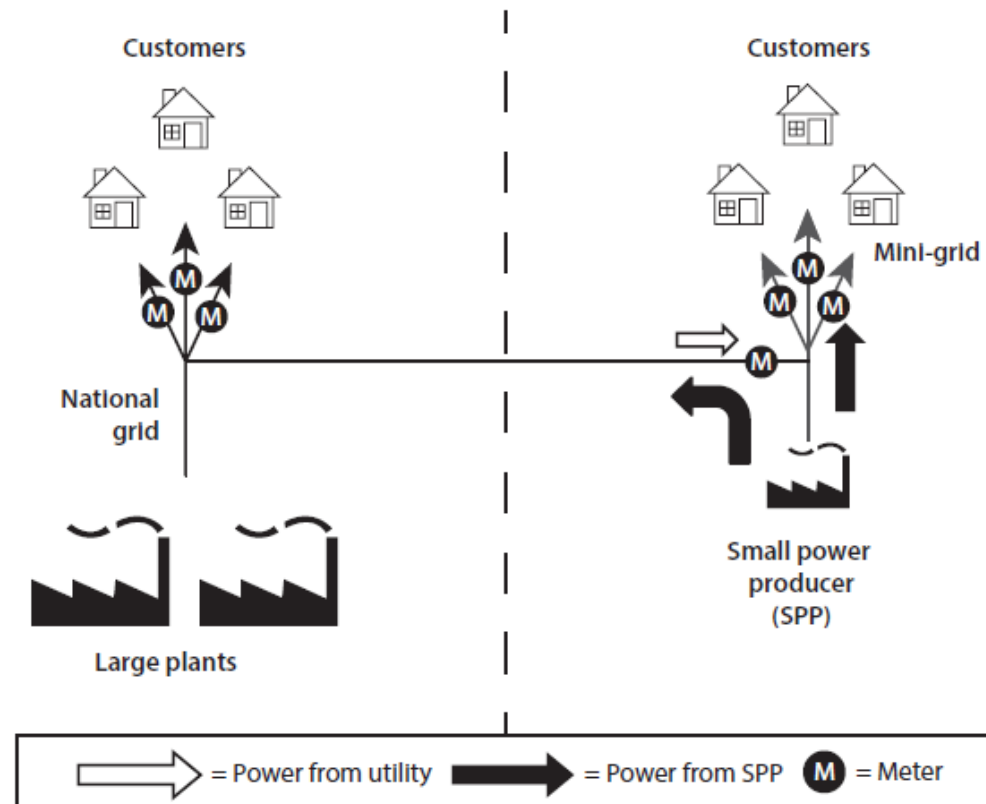
- + >250 isolated community-owned hydropower built with financial support from GoSL, GEF and World Bank
- + With arrival of national grid >100 mini-grids abandoned
- + Three projects: 12 to 45 kW converted to SPPs
 - Five more in pipeline
 - No longer provide retail sales to village



Indonesia: SPP selling excess, coexist

+ Of 200 community-owned mini-grids where national grid has arrived...

- 150 abandoned, PLN takes over.
- 40-50 villages mini-grids co-exist selling retail electricity but electrically isolated from PLN (side-by-side distribution networks).
- 9 have become SPPs.
 - Sell all or some electricity to national grid



Lessons

- + **Viable examples of formerly isolated village mini-grids connecting to main-grid exist...**
 - Hydropower able to remain financially viable selling wholesale to utility (Sri Lanka & Indonesia)
 - Mini-grids with utility-grade distribution networks transitioning to small power distributors (Cambodia)
- + **... but are rare**
 - Most mini-grids abandoned when utility arrives
- + **Cost of interconnection depends on business model**

Questions

- + What can be done to lower risks accompanying arrival of national grid?**
 - Governments
 - Utilities
 - Mini-grid developers

- + Do new technologies or new business models hold promise in facilitating smooth integration of mini-grids and the national grid?**

Thank you



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MINI-GRIDS AND ARRIVAL OF THE MAIN GRID LESSONS FROM CAMBODIA, SRI LANKA, AND INDONESIA

Chris Greacen

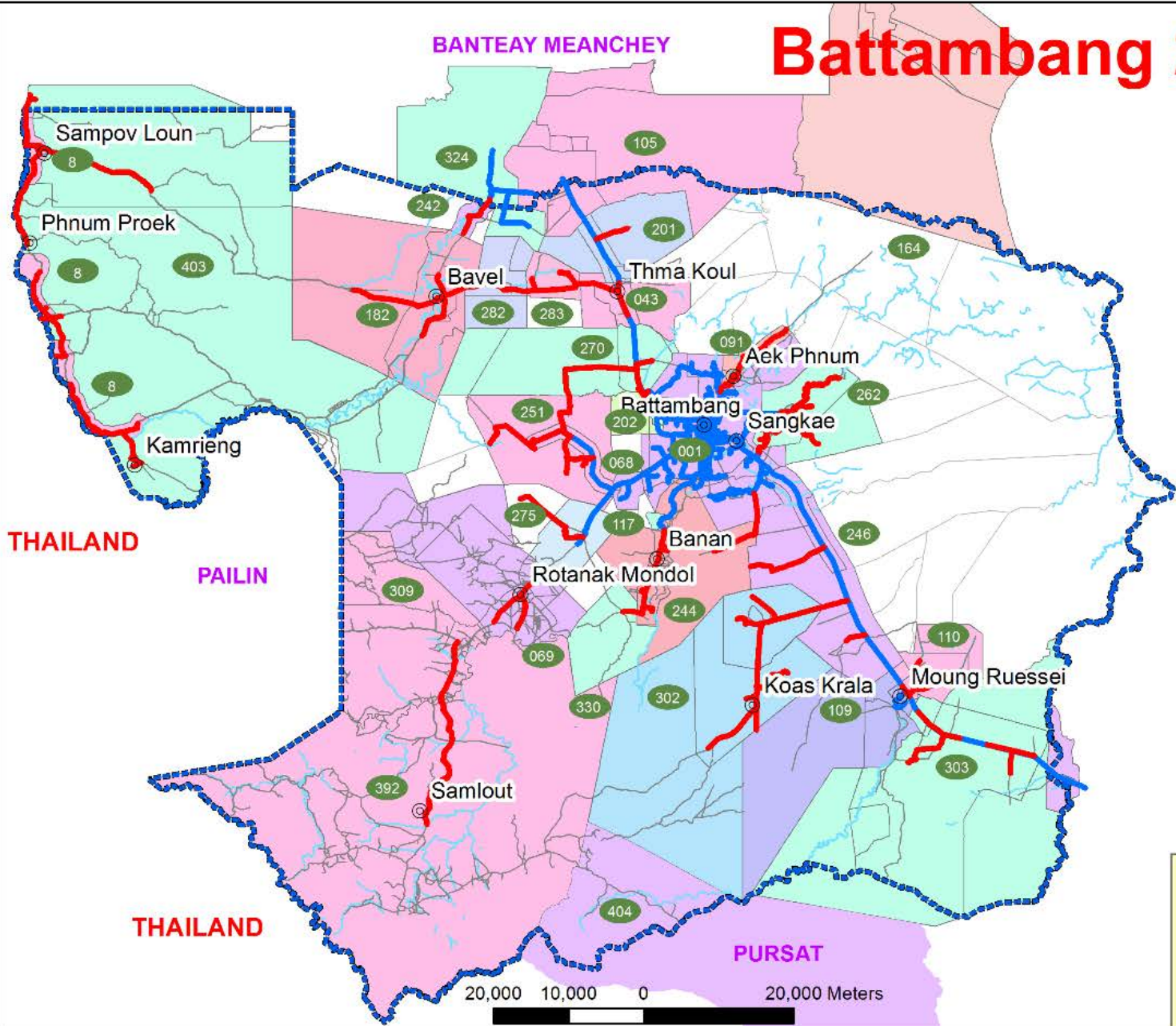
<https://www.esmap.org/node/57666>



Breakout guidance

- + 10 minutes: to re-introduce and answer any questions
 - + 15 minutes: identify problems that need to be solved
 - + 2-3 minutes: to pick two key problems
 - + On each topic -- 15 minutes: what has been tried? Under what circumstances? If it didn't work, why not?
 - What roles can gov't, private sector, development partners play?
- + What can be done to lower risks accompanying arrival of national grid?
 - + Do new technologies or new business models hold promise in facilitating smooth integration of mini-grids and the national grid?

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