ADB energy for all
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100% Solar in South Asia Implications for Technological and Social Transformation

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India's electrification is expanding enormously x3 to x4 by 2040;

Key features

- Ambitious renewable energy targets (100% solar is technically feasible)
- A geographically very large grid, with weak connectivity
- Huge diversity, in demand patterns, and generating patterns

= High complexity (over time and space, over sinks and sources)

= "smarter" grid operations from "the last mile" to the "large generators"

= "demand management" is essential ("demand is king" is on the way out)

= India can lead the world in energy management technology

Demand management components

Last-mile

- "end use" storage capacity as "energy storage" (reduce requirement for battery storage) (typically >50% of domestic/light commercial end use energy is related to heating, pumping, cooling)
- Micro-grids can be run in DC mode = 30% less copper, much higher transfer efficiency, easier demand management control

Transmission network

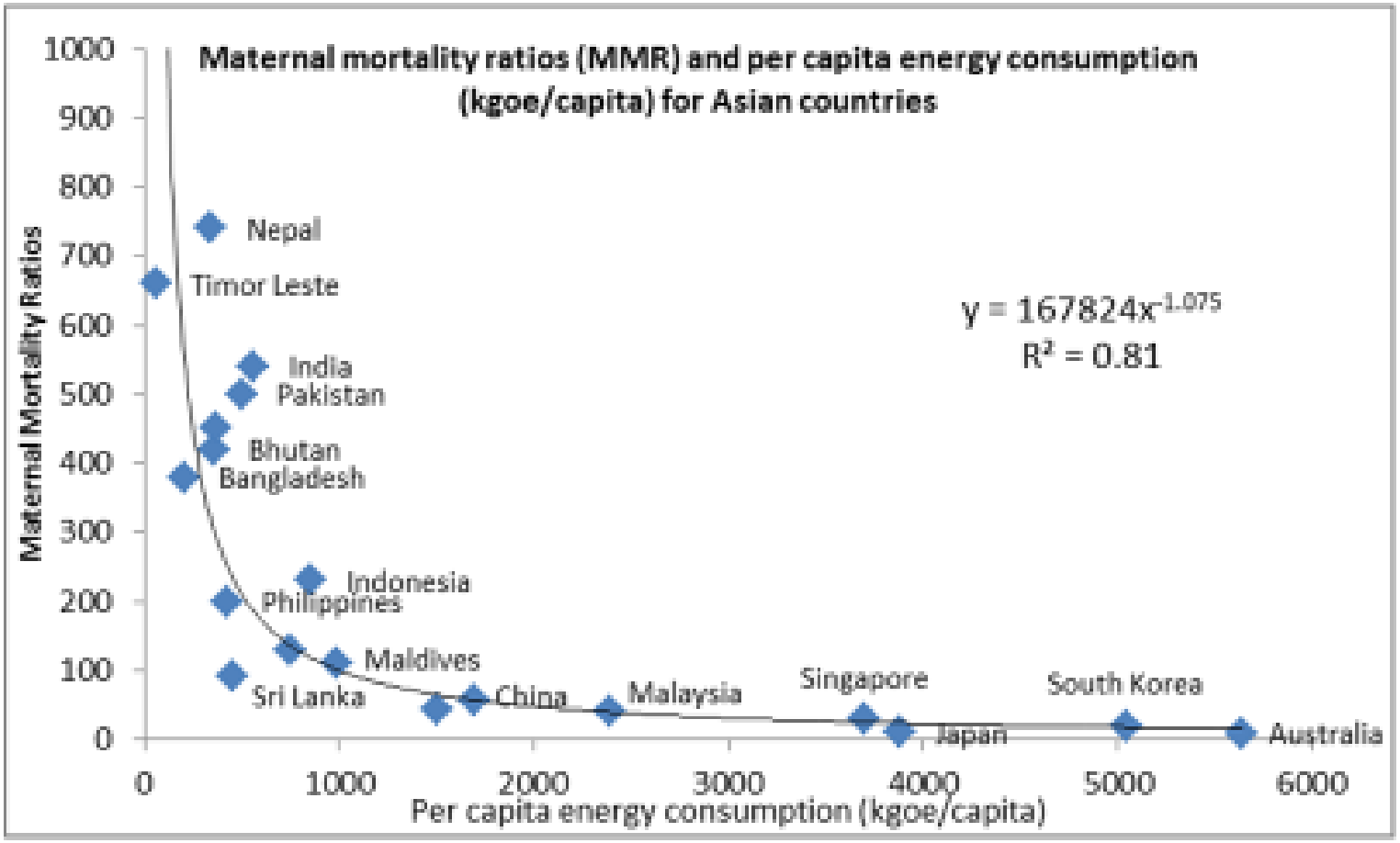
- Enable diversity with precision PMUs
- Develop novel protection methodology (reverse currents, tie-line control)
- Dynamically predictive management of grid (wind and solar friendly)

Energy Access and Women's Health

There is a strong (-ve) correlation between energy consumption and MMR

Education is key

Little energy but great impact



R. Mohideen, 2014. University of Melbourne, PhD research.

- Smarter grid technology can enable India's unusual diversity in electricity
- No 'technological-fix' to socio-economic problems and gender inequalities
- Distributed and decentralised small-scale systems will be key (flexibility, reduced cost to install as compared to other options)
- Renewable energy technologies inherently gender-friendly?
  A question the University of Melbourne, in partnership with the ADB is analysing in Bhutan, Nepal, India and Sri Lanka