

How Will The Role of Utilities Evolve in Future Energy Systems?

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Energy & Extractives Global Practice**

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Easter Parades on Fifth Avenue, New York

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1900: No cars, just horses



1913: No horses, just cars



Images: L, National Archive, www.archives.gov/research/american-cities/images/american-cities-101.jpg R, shorpy.com/node/204
Inspiration: Tona Sebi's keynote lecture at AltCar, Santa Monica CA, 28 Oct. 2014, <http://tonysebi.com/keynote-at-altcar-expo-100-electric-transportation-100-solar-by-2030/>

The new debate on Power Sector Reform

The time has come to start focusing:

- **more** on unleashing the transformational power of distributed generation; and
- **less** on traditional institutional reforms to fix ailing utilities?

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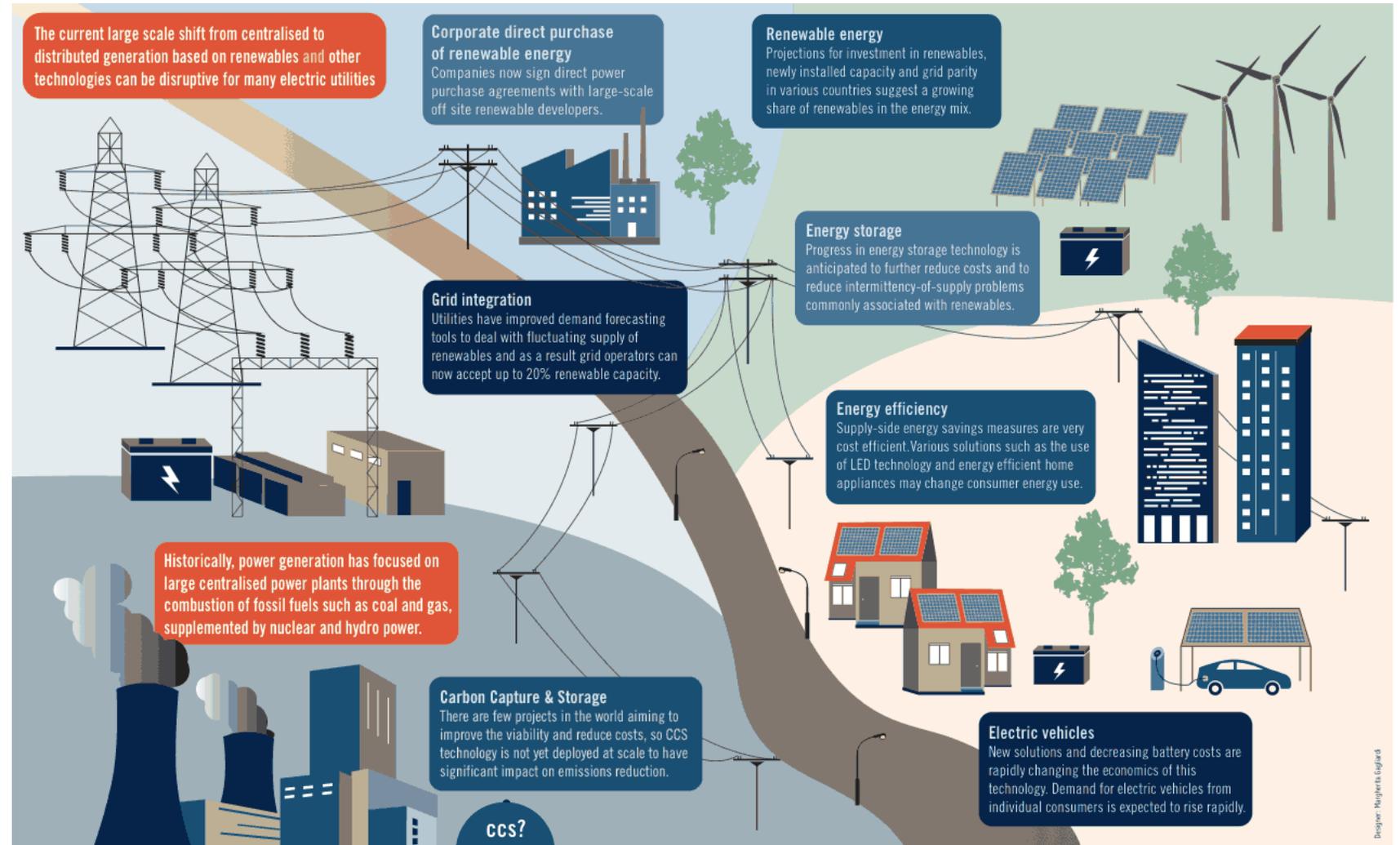
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Outcome of vote by 200+ World Bank Energy Staff May 2017

For: 50% Against: 50%

Disruptive technologies offer potential to transform power systems saving both money and carbon

- Rooftop solar
- Distributed generation
- Electricity storage
- Electric vehicles
- Advanced electronics
- Advanced metering
- Smart grids



Unleashing this potential requires second wave of institutional and regulatory reforms

ELECTRICITY PRICING

- Volumetric charges no longer adequate
- Design charges that are more fully cost-reflective
 - By time-of-use and location
 - Symmetrical for injections and withdrawals
 - Based on use of peak coincident capacity
 - Tax users for 'public good' service provided by grid

REGULATORY INCENTIVES

- Introduce regulatory regimes with flexible incentives for innovation
 - Create forward-looking multi-year regimes
 - Equalize incentives for OPEX and CAPEX
 - Provide outcome-based performance incentives
 - Incentivize innovations with longer-gestation periods
 - Do automatic adjustment factors for forecast errors

INSTITUTIONAL ROLES

- Allocate institutional roles so to avoid conflicts of interest and abuse of market power
 - Full financial and legal unbundling of distribution system operator, system planning and market platforms
 - Consider introduction of data hub or exchange to provide non-discriminatory access to consumer data

Developing countries have struggled to implement first wave of power sector reform

- **Regulation**

- Regulators fairly common but often lack capacity and independence

- **PSP in distribution**

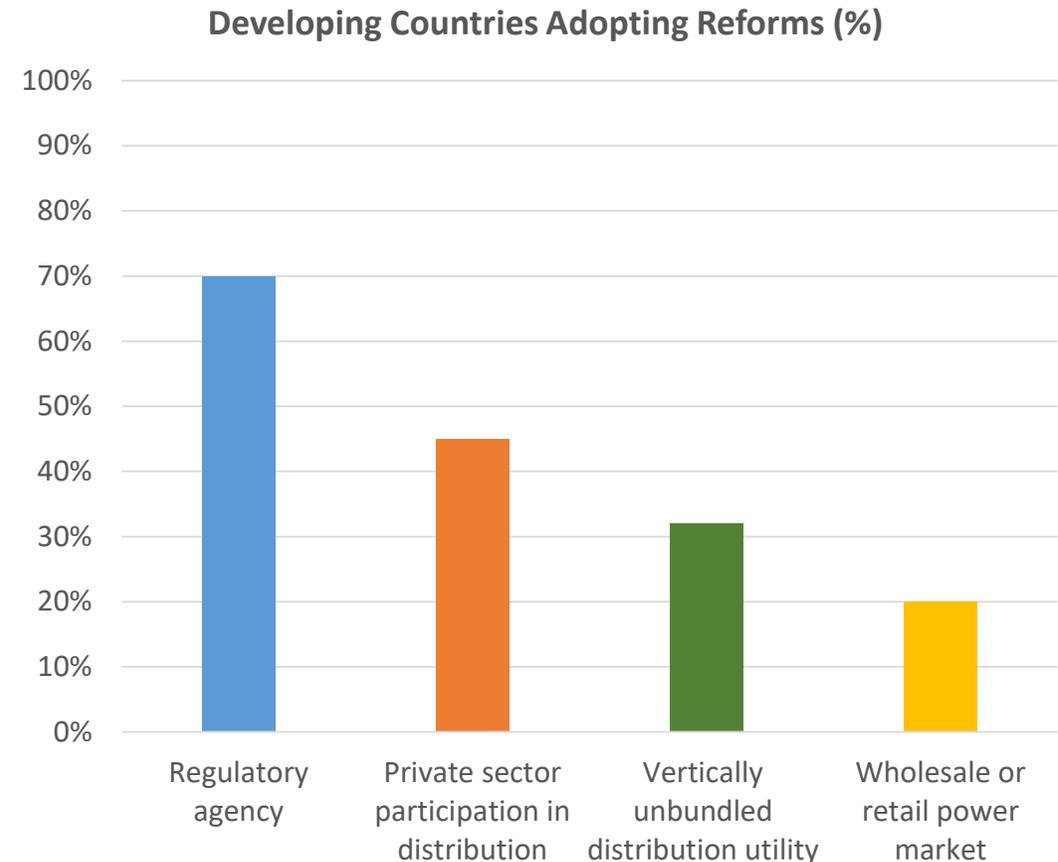
- Tried by almost half of countries but still only affects a quarter of utilities

- **Unbundling**

- Only one in three countries have fully unbundled distribution utilities

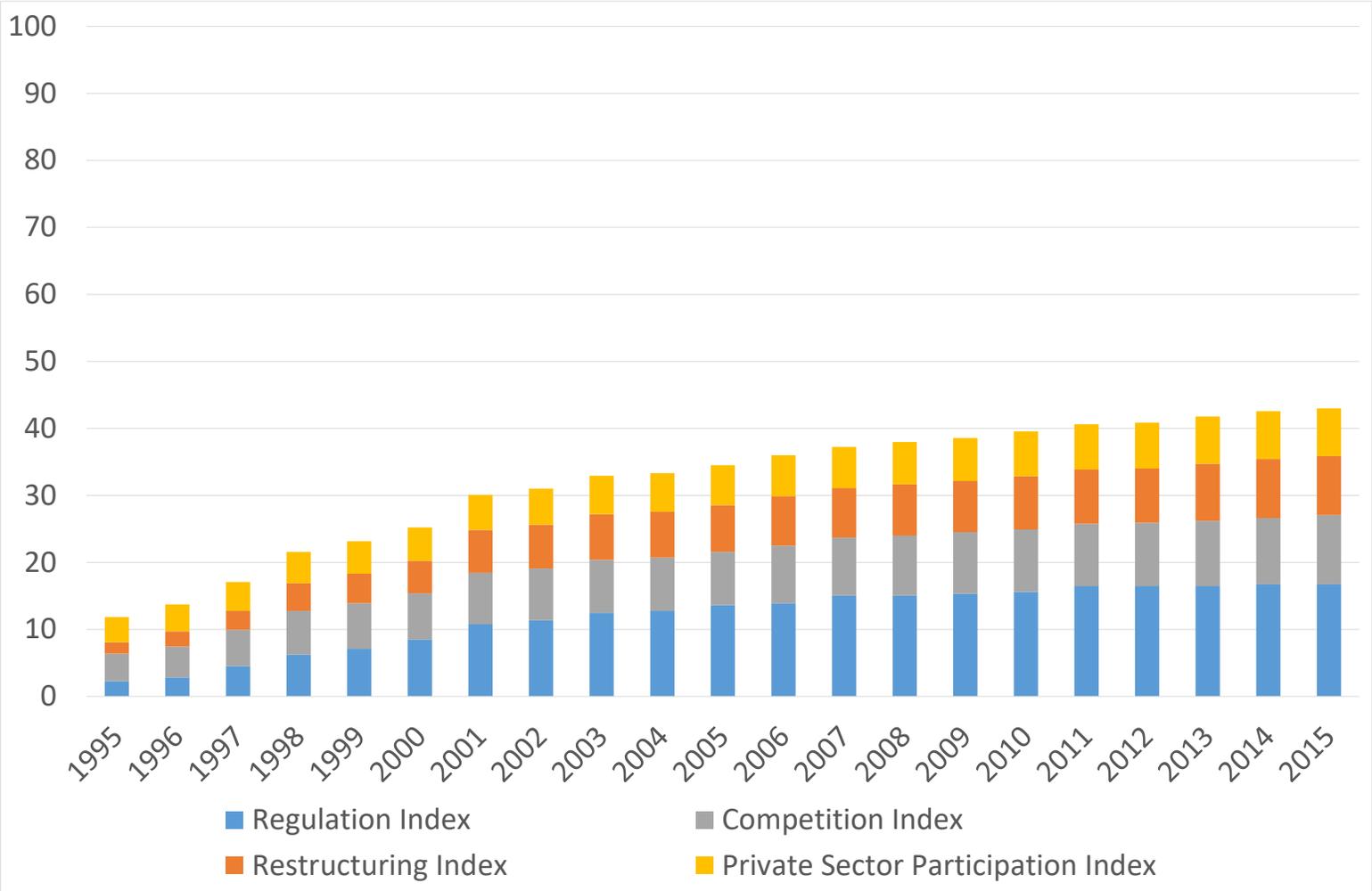
- **Power markets**

- Only one in five countries have power markets, typically larger middle income



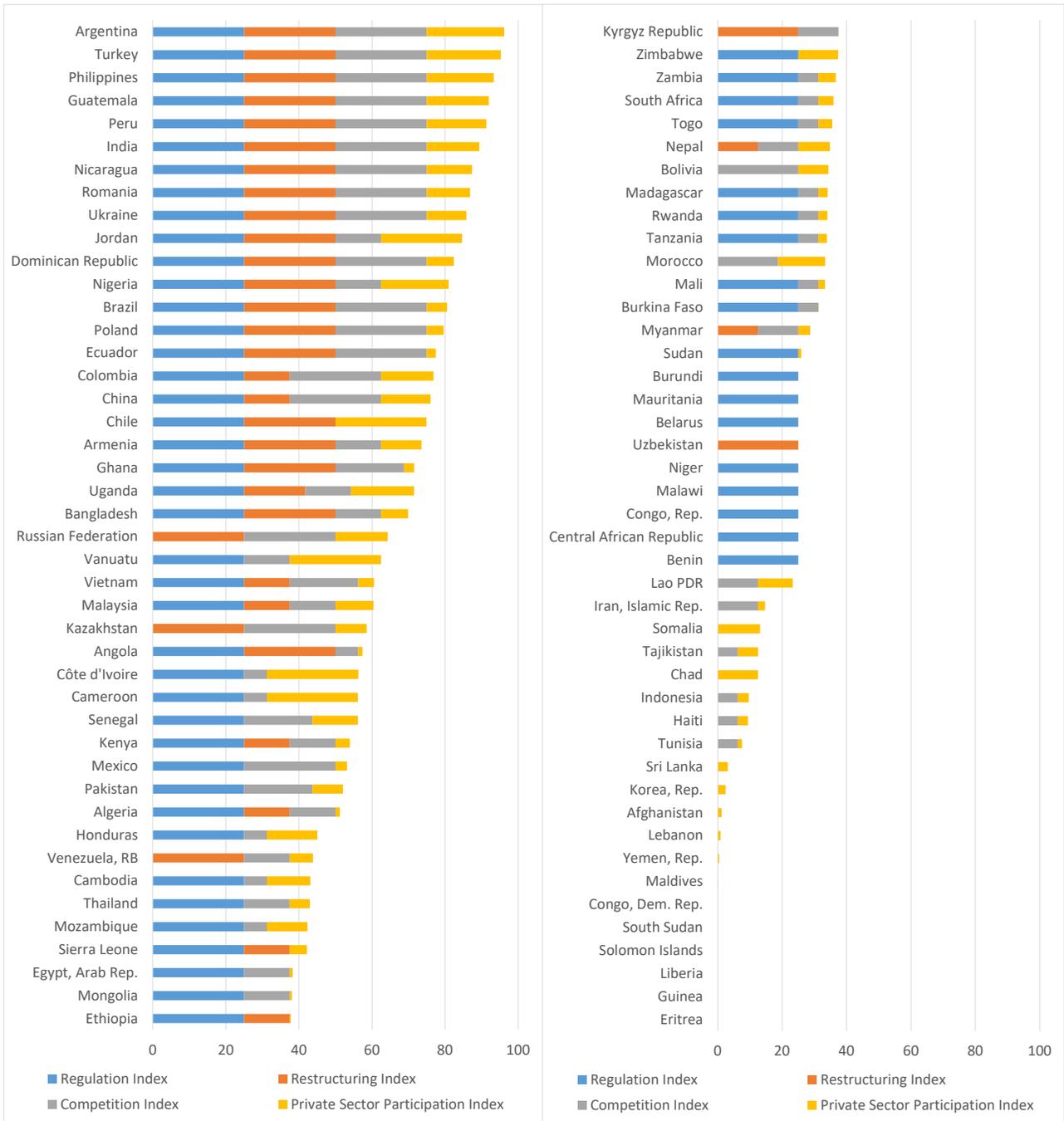
Pace of market reforms has slowed since 2005

Global Average Power Sector Reform Index for Developing Countries, 1995-2015



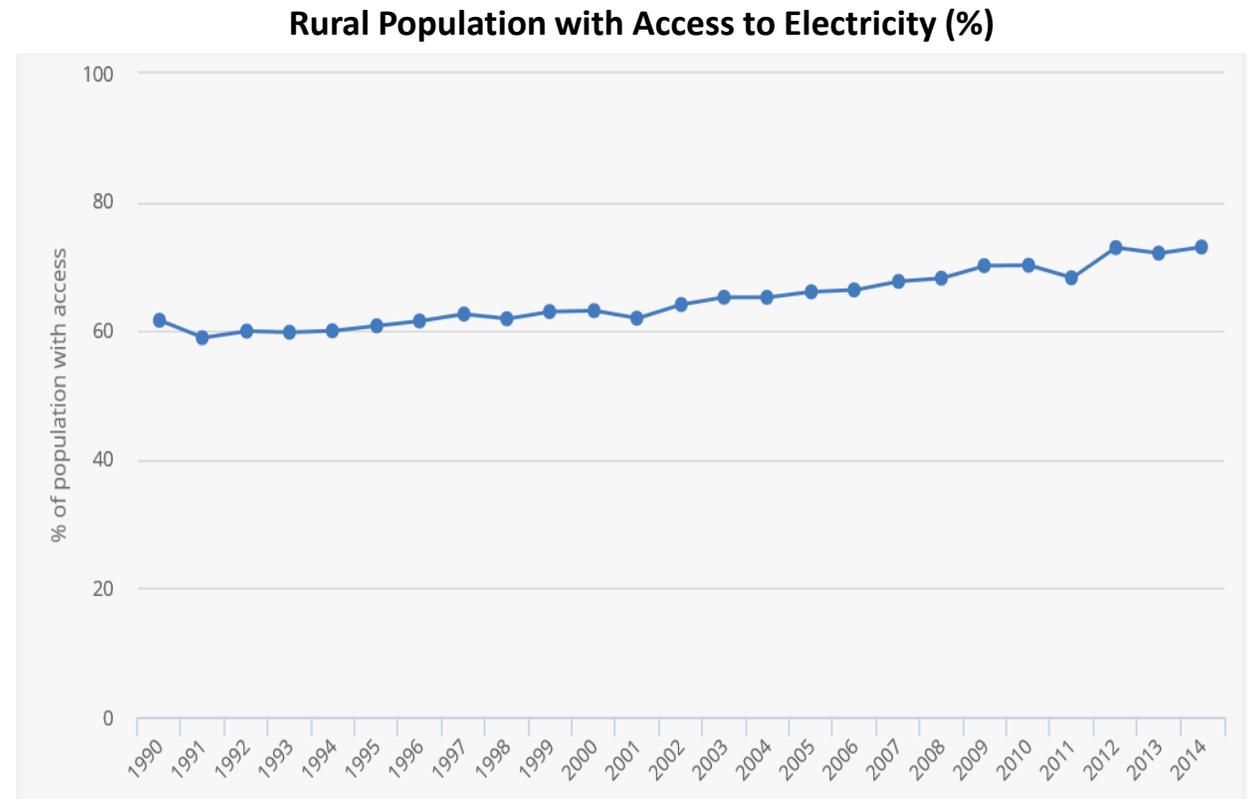
Barely a dozen developing countries score above 80

Country Scores for Power Sector Reform Index, 2015



Growing political focus on rural electrification that was often overlooked by first wave of reform

- Global flat trend of rural electrification
 - High cost of grid extension
 - Affordability challenges
 - Weak incentives for utilities
- New technologies offer promise of accelerating electrification
 - Falling cost of Solar PV
 - Rising efficiency of appliances
 - Digital innovation in payment
 - Mini-grids and off-grid models



The significance and impact of new technologies may differ at different stages of development

Developed countries

- Context
 - Universal access achieved
 - High quality of service
 - State of the art infrastructure platform
 - Advanced stage of market reform
 - Strong regulatory capacity
- Implications
 - Potential to improve efficiency and resilience of established urban networks
 - Contingent on suitable regulatory and institutional platforms being in place

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Developing countries

- Context
 - Major access gaps
 - Poor quality of service
 - Deficient infrastructure platform
 - Market reforms proving challenging
 - Weak regulatory capacity
- Implications
 - Initial focus is on potential to accelerate electrification through off-grid approaches
 - Possibility to leap-frog in urban contexts where conventional grids deficient

Many key policy questions remain unanswered

- Do developing countries need to complete the first wave of power sector reforms before embarking on the second wave?
- How much of a difference can disruptive technologies make in traditional state-owned monopoly sectors?
- Is the threat of grid defection in developing countries larger (due to poor quality of service) or smaller (due to subsidized tariffs)?
- Is leapfrogging to decentralized generation with storage a real possibility in developing markets? If so, is it desirable?
- How do emerging policy prescription for OECD countries need to be adapted to the developing world context?

Break out into two parallel sessions

#1 Smart Delivery On and Off Grid

Moderator: Sheoli Pargal (go to room)

- **From Traditional DISCOM to Smart Utility** (Praveen Sinha, CEO, Tata Power Delhi)
- **An Emerging Distance Model** (Christopher Baker-Brian, CTO, BBOX)
- Table discussions and report back

#2 Drivers of Evolution of Utilities

Moderator: Vivien Foster (stay here)

- **Utility of the Future in Developing Countries** (Pradeep Pursnani, COO, Shell Foundation)
- **Adapting Regulatory Models to Drive Innovation** (Martin Crouch, Senior Partner, OFGEM)
- Table discussions and report back

Breakout Session #2 – Speaker Bios



**Martin Crouch,
Senior Partner,
Improving Regulation,
OFGEM**

- 10+ years at OFGEM leading numerous departments on distribution, transmission, clean energy and European markets
- Currently responsible for regulatory development and innovation agenda



**Pradeep Pursnani,
Deputy Director,
Chief Operating Officer,
Shell Foundation**

- Since 2010, with Shell Group leading their expanding cook stoves program
- Since 2012, with Shell Foundation leading all operational programs and responsible for strategy development

Breakout Session #2 – Discussion Questions

- What barriers and opportunities to implementing the “utility of the future” vision do you see in the country/context in which you work?
- What can governments or regulators do to help drive technological and institutional innovation the country/context in which you work?