3rd GSMA Green Power for Mobile India Specific Working Group

Policy support strategy

April 13, 2012



Agenda

Large opportunity to realize social and economic benefits of RET adoption at telecom towers

Policy conundrum: current trajectory of adoption unlikely to reach DoT targets

Potential framework for policy interventions to drive uptake in RET adoption

Significant public benefits from accelerating RET adoption at telecom towers

Drivers of accelerated adoption of RET at telecom towers

- **A** Industry's push to lower energy costs
- **B** Government drive to reduce public costs
- **C** Potential to provide community power to further improve economics

Potential benefits

Public sector saving

1. Significant reduction in diesel consumption and associated public costs
2. Large reduction in CO_2 emissions

Added benefits of extending electrification

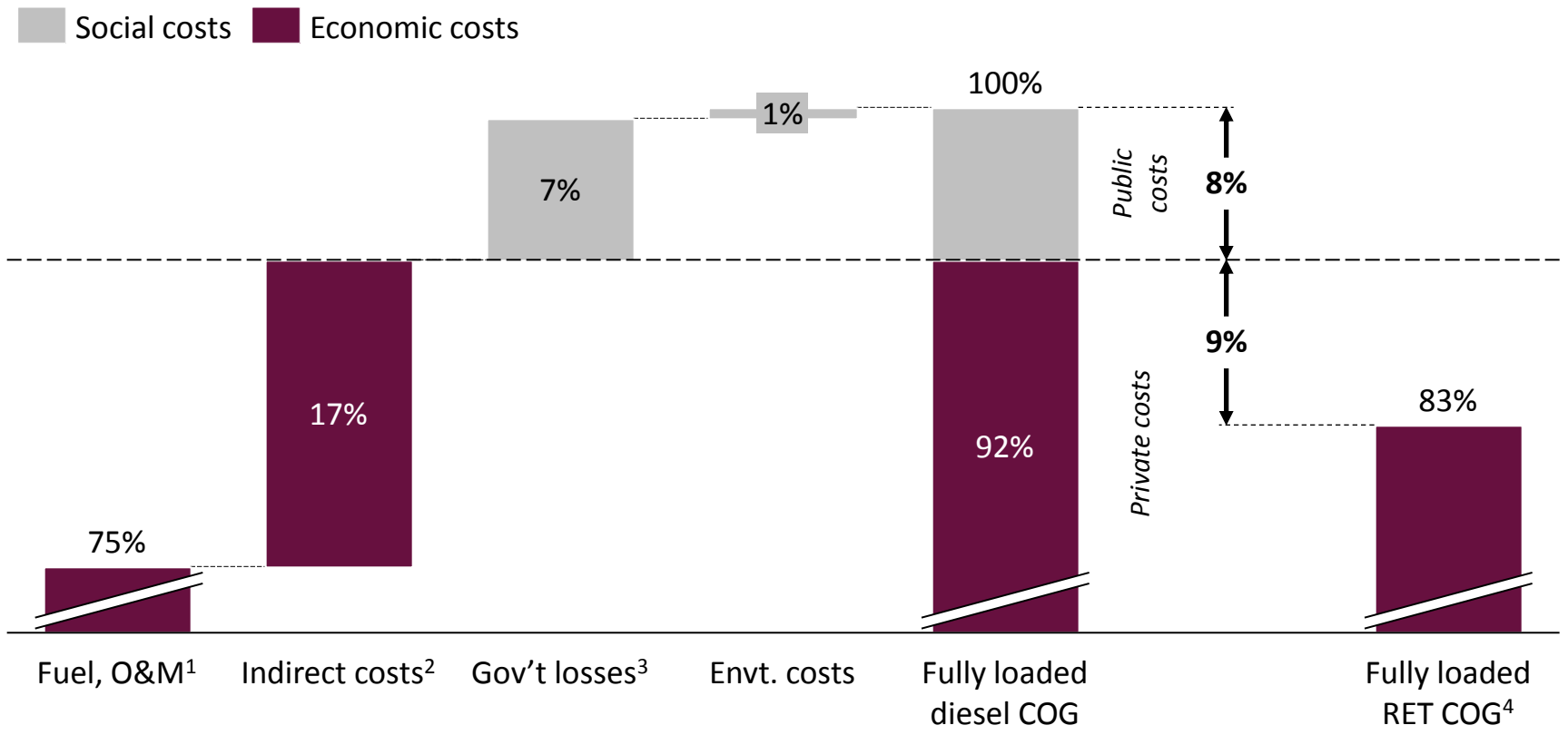
3. Several million people with increased access to energy
4. Increase in ARPUs via mobile phone charging opportunity

1. According to our aggregation of industry feedback, 25% of the tower estate is currently feasible to be RET powered, while DoT mandates ~34% of all towers should be RET powered by 2015 (20% urban and 50% rural).

SOURCE: Dalberg analysis

RET is also beginning to make economic sense for certain telecom towers, driving the industry towards faster adoption

Average composition of cost of generation from diesel and RET at a 2 BTS, off-grid telecom tower
% of average cost of generation of diesel



1. Expenditure on fuel alone accounts for 65% of the fully loaded cost of generation from diesel.
2. Indirect costs include pilferage of fuel and electricity.
3. Gov't losses are the difference between Oil Marketing Companies under-recoveries and central taxes (sales, VAT).
4. Average of modeled costs of generation from Solar-DG hybrid and Biomass-DG hybrid at 100% capacity utilization; 33% of energy comes from diesel fuel.

SOURCE: Dalberg analysis

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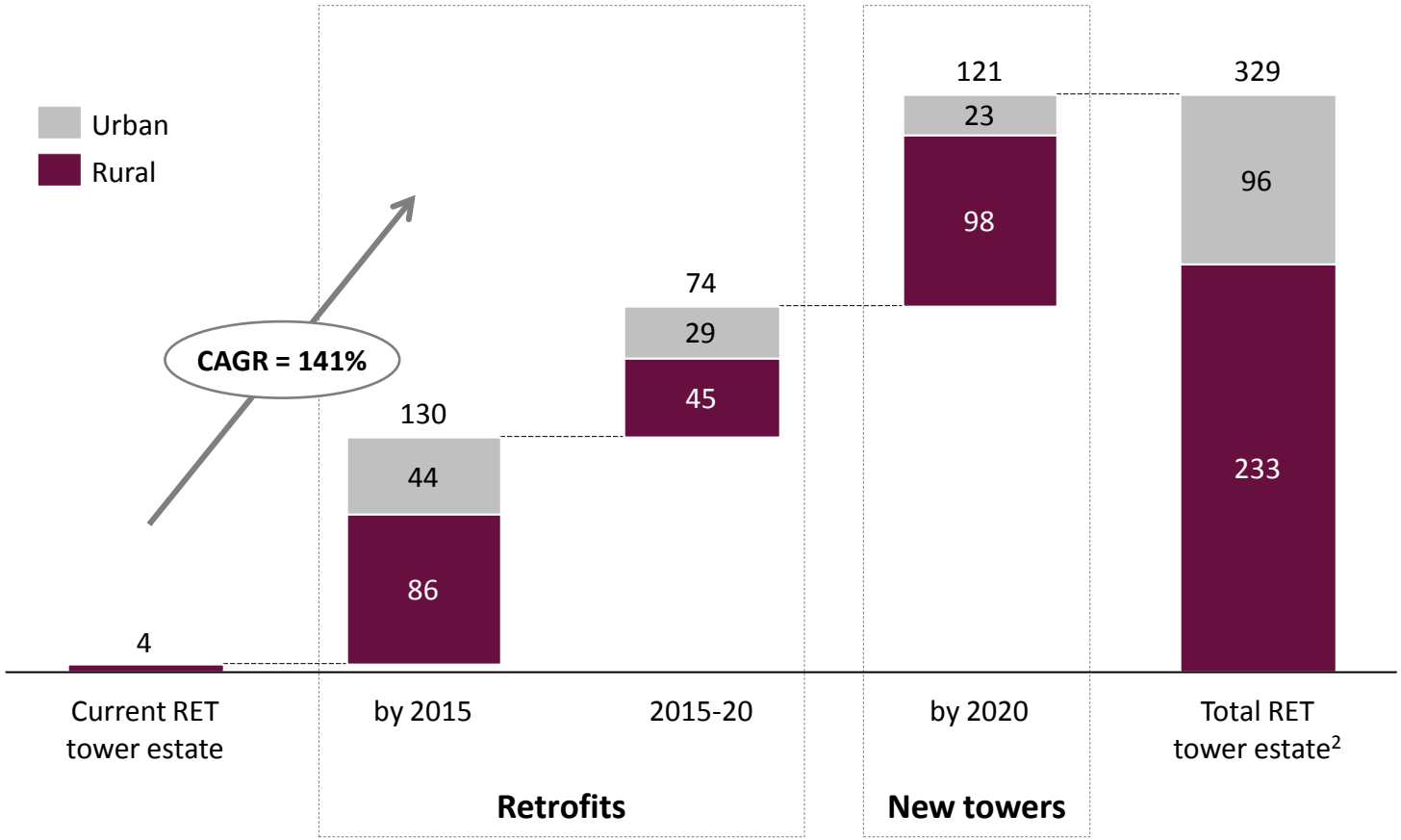
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DoT targets imply more than doubling RET towers every year till 2015

Number of telecom towers in India operating on RET hybrid solutions[1], as per DoT mandate[2]
'000 towers



1. Definition of "RET hybrid", as per latest mandate documentation is a combination of renewable technology and grid power.
2. DoT mandate is on converting at least 20% urban and 50% rural telecom towers to RET hybrid power by 2015; and 33% and 75% by 2020 respectively.
3. According to industry feedback, total tower estate in India is expected to reach at least 600k by 2020 – used in calculations for this analysis.

SOURCE: Dalberg analysis

Several barriers that the government needs to account for

1. **Financial barriers for RESCOs**

   Despite the impending entry of large players in the market, RESCOs will be unable to raise the INR 30-40k Crore capital required to scale the outsourced energy generation model.

2. **Distortions in assessment of economic viability**

   The true cost burden of diesel price is difficult to estimate, as there are significant hidden indirect costs, e.g., fuel pilferage, environmental costs and cost of government subsidies.

3. **Operational barriers**

   Intermediaries informally invested in the diesel supply chain prevent replacement of diesel at a tower site by renewable energy.

4. **Switching costs associated with shifting to renewable energy**

   Even if there is a positive economic case to switch to renewable energy there are some sources of inertia. A key example is the misalignment of incentives versus decision-making powers over the choice of energy technology between MNOs, TowerCos and RESCOs.

SOURCE: Industry feedback, Dalberg analysis

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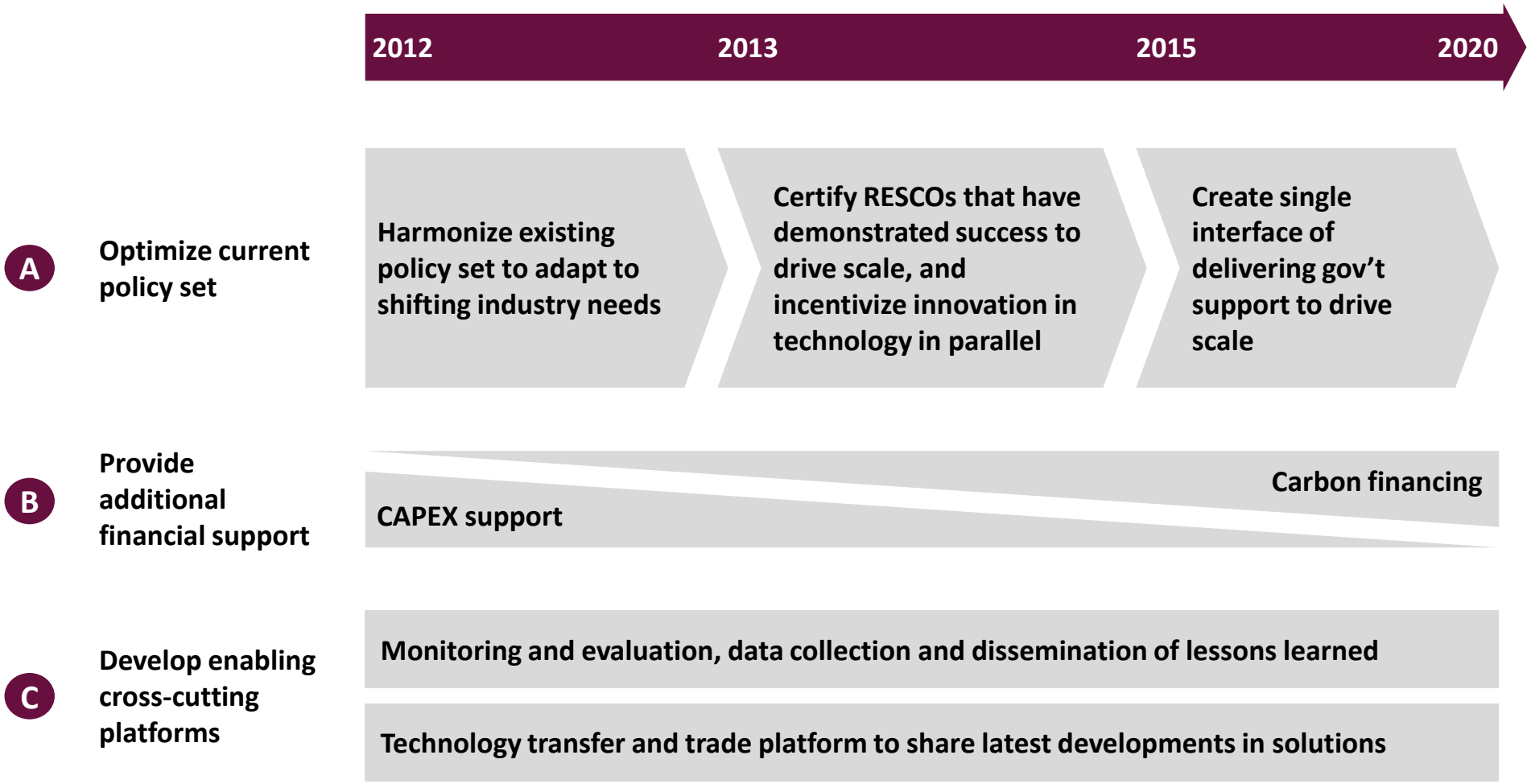
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Key needs are to extend coordination between gov't agencies, optimize the current policy set, and unlock additional funds for RESCOs

Framework for designing a holistic policy support strategy



SOURCE: Dalberg analysis

Harmonize existing policy set to adapt to shifting industry needs

	Barrier	Implication	Potential solution(s)
1 **Merge resource pools**	Several disparate, but potentially overlapping resource pools (e.g., MNRE, USOF etc.) acting towards similar goals	Continuous division of the broader resource pool towards RET restricts capital available for specific applications	Coordinate between subsidies for RET power and rural electrification to enlarge resources available and encourage community power distribution from towers
2 **Promote quality in the RESCO industry**	Current policies (largely application specific incentives) and DoT mandate (unclear share of RET in energy mix) could see the rise of sub-standard solutions	Several fly-by-night operators with products catering to specific subsidies instead of real market needs may emerge, losing the trust of the telecom industry	Introduce standards in technology and service delivery models, and refocus incentives towards delivery of results (e.g., level of diesel substitution), instead of being technology / application specific
3 **Increase access to carbon financing**	Only grid-interactive projects get access to RECs; scale needed to access other programs	Non-grid interactive telecom tower installations by sub-scale RESCOs rule out access	Leverage new solutions for monitoring (e.g., PIUs[1]); apply these to programmatic approaches to aggregate data

1. Power Interface Units

SOURCE: Dalberg analysis

Create single interface of delivering gov't support to drive uptake

Framework to reduce transaction costs for RESCOs by consolidating gov't interfaces

Oversight, monitoring, and compliance

(e.g. centralized data collection system; randomized compliance checks on renewable energy usage)

	1	2	3	4	5
Components	**Energy marketplace**	**Taxes and duties**	**Subsidies & financial incentives**	**Licenses and permits**	**Consultations with broader industry**
Activities	• Aggregation of contracts and government tenders • Knowledge warehouse for investors	• Re-evaluate any distorting taxes and duties for any specific RET equipment needed by RESCOs	• Consolidation of financial incentives (e.g., CFA, MNRE, potentially USOF-FLDG) under one umbrella	• Common application process for licenses and permits, e.g., PCB, safety, REC, etc.	• Encourage sharing of insights and lessons learned on new technology, success stories, etc.

Reduce cost of doing business

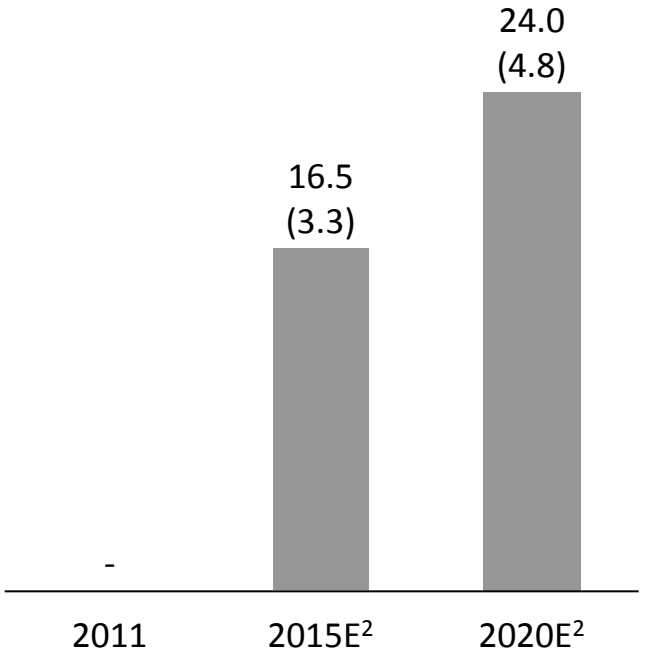
Increase ease of doing business

SOURCE: Dalberg analysis

Unlock additional funds to fill large gap in CAPEX requirement

Estimated cumulative CAPEX requirement for retrofitting telecom towers to RET hybrids, as per DoT mandate[1]

INR '000 Crore (US$ bn)



	2011	2015E[2]	2020E[2]
Cumulative retrofitted towers	**4k**	**134k**	**208k**

- ***Barrier***: Insufficient financing in the market for small-scale RESCOs that will carry 100% of CAPEX burden going forward
- ***Implication***: Large financing gap of ~INR 24,000 Crore (US$ 4.8 bn) for retrofits alone will be a bottleneck for accelerated rollout
- ***Potential solution***: Leveraged financial instruments to reduce cost of capital for RESCOs (e.g., FLDG), potentially using existing resources, i.e., USOF
- ***Rationale***: Improving economics of RET mean government can leverage existing resources with private sector funding

1. Assuming INR 0.7 and INR 1.4 million for retrofitting urban and rural towers respectively (weighted average of expected market share of solar and biomass).
2. DoT mandate targets: min 20% urban towers converted by 2015 (33% by 2020); 50% rural towers converted by 2015 (75% by 2020).

SOURCE: Dalberg analysis

Thank you!