S P E E D
SMART POWER FOR ENVIRONMENTALLY-SOUND ECONOMIC DEVELOPMENT

Overview
GSMA - Community Power from Mobile

Sanjay Khazanchi

Accra, 5th Nov 2012






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SPEED – Long Term Goal

Positive impact on the lives of poor and vulnerable populations by providing affordable, reliable clean energy to rural communities, thereby improving the quality of life and enhancing livelihood security

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No Power





But Mobile Phones Everywhere!





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SPEED
Smart Power for Environmentally-sound Economic Development

Context and Opportunity

Rural India

409 million w/out electricity

- Compared to 490 million in 1991
- Bulk of these are in Rural areas

RGGVY a great step towards rural electrification and with good intent but has it resolved issues?

- Can we rely on "Power for all by 2012"?
- Does Grid connectivity mean power access?

18,000 villages will not be connected to the grid.

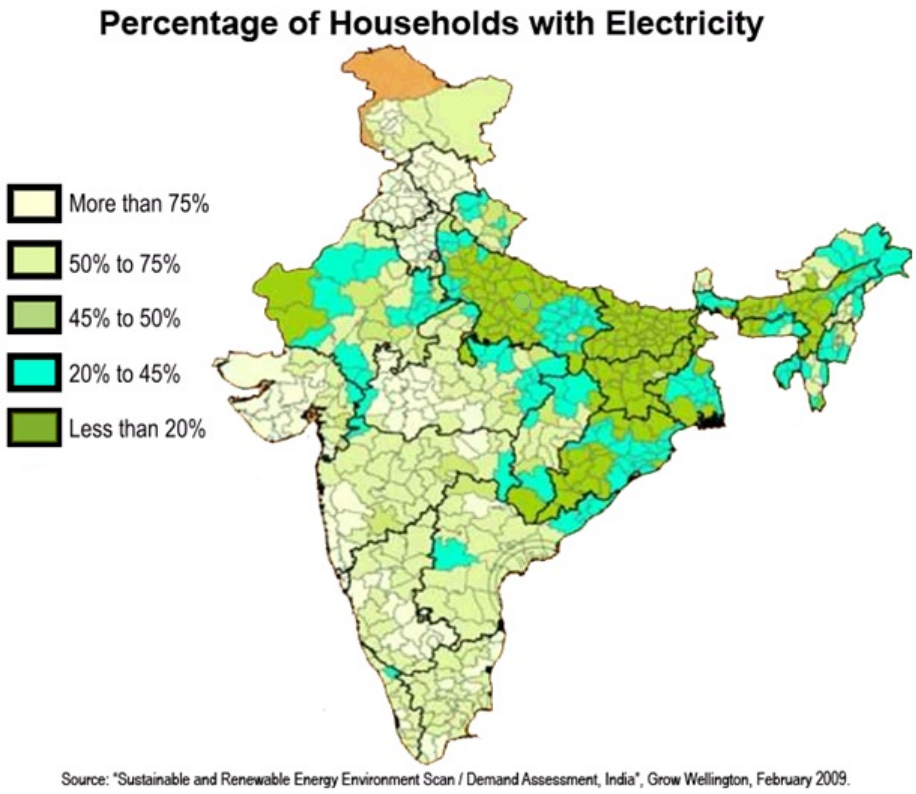
Telecom towers

- Rural cell towers in the country represent key customer base customers
  - using 2bn litres of diesel p.a
- Assured Energy access is the key

% of cell sites	Grid supply availability	Description
10%	>20 hrs	Mainly metros – Delhi, Mumbai, Chennai, Kolkatta. Some cities of Gujarat, Punjab, Chhattisgarh
20%	16-20 hrs	Most other major cities and towns
30%	12-16 hrs	Semi-urban and small urban towns
25%	8-12 hrs	Mostly rural areas
15%	< 8 hrs	Parts of Bihar, Jharkhand, Orissa, UP, J&K and NE states

Problem

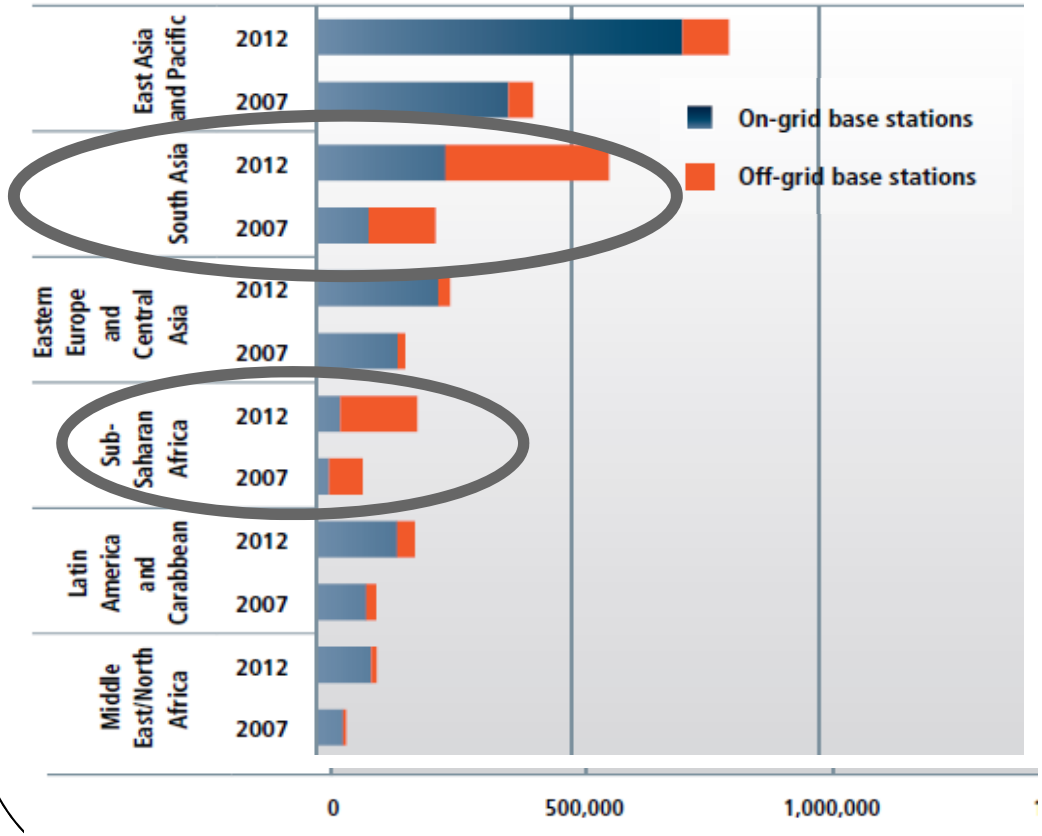
- **Goal:** Shape sustainable Economic development and Poverty Alleviation program
  - Assured Energy access is the key
- **409** million w/out electricity
- Compared to **490** million in 1991
- Bulk of these are in Rural areas
- 18,000 villages are yet to connect with grid



Source: "Sustainable and Renewable Energy Environment Scan / Demand Assessment, India", Grow Wellington, February 2009.

The Opportunity

Mobile Phase Base Stations by Region



- *Over 400 million people without access to electricity services in India*
- *India has over 400,000 cell phone towers*
- *150,000 of those in rural areas*
- *60% of all towers are powered by Diesel generators*

Source: GSMA

Source: TRAI

Barriers to Rural Electrification at scale

Why Scale is not seen?

- Demand broad but shallow - uncertainty around contiguity of demand leading to sustainability issues.
- Under-developed industry and financing infrastructure to drive growth...capability and appetite constraints to support the scale
- Lack of clarity and adequate recognition around ability and willingness to pay
- Sustained O&M – profitability and trained manpower
- Under-developed regulatory environments

The SPEED Approach



- Enter an unserved or underserved community
  - Engage cell phone operators as customers and investors
  - Involve local communities as owners, customers and entrepreneurs
- Stimulate local economic activity
  - Drive viability of other anchor loads
  - Extend power to households and businesses
- Drive long-term economic development
  - Attract capital for ESCO development
  - Aim for grid parity

DG Bio-mass Wind Solar Micro-hydel Micro-enterprise

SPEED: an Integrated Solution

Micro Utility

Optimize Resources

- *Biomass*
- *Biofuel*
- *Sunlight*
- *Wind*
- *Fossil Fuel*

Produce Power

Candidate Technologies

- *Biomass Gasification*
- *Biogas*
- *Solar PV*
- *Backup Genset*
- *Wind Turbine*

Distribute Power

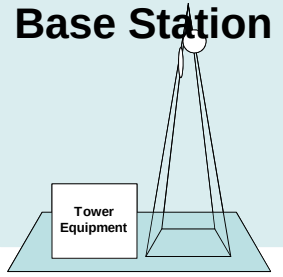
Tower Power Management System

Community Distribution System

- *Marketing*
- *Collections*

- Steady load
- 99.9% uptime

Anchor Loads such as Mobile Phone Base Station



- Varying load
- Cross - subsidized by tower

Host Villages

Public Use
street lighting, schools, clinics

Microenterprise
battery charging, agri-processing, manufacturing

Personal Use
lighting, communications

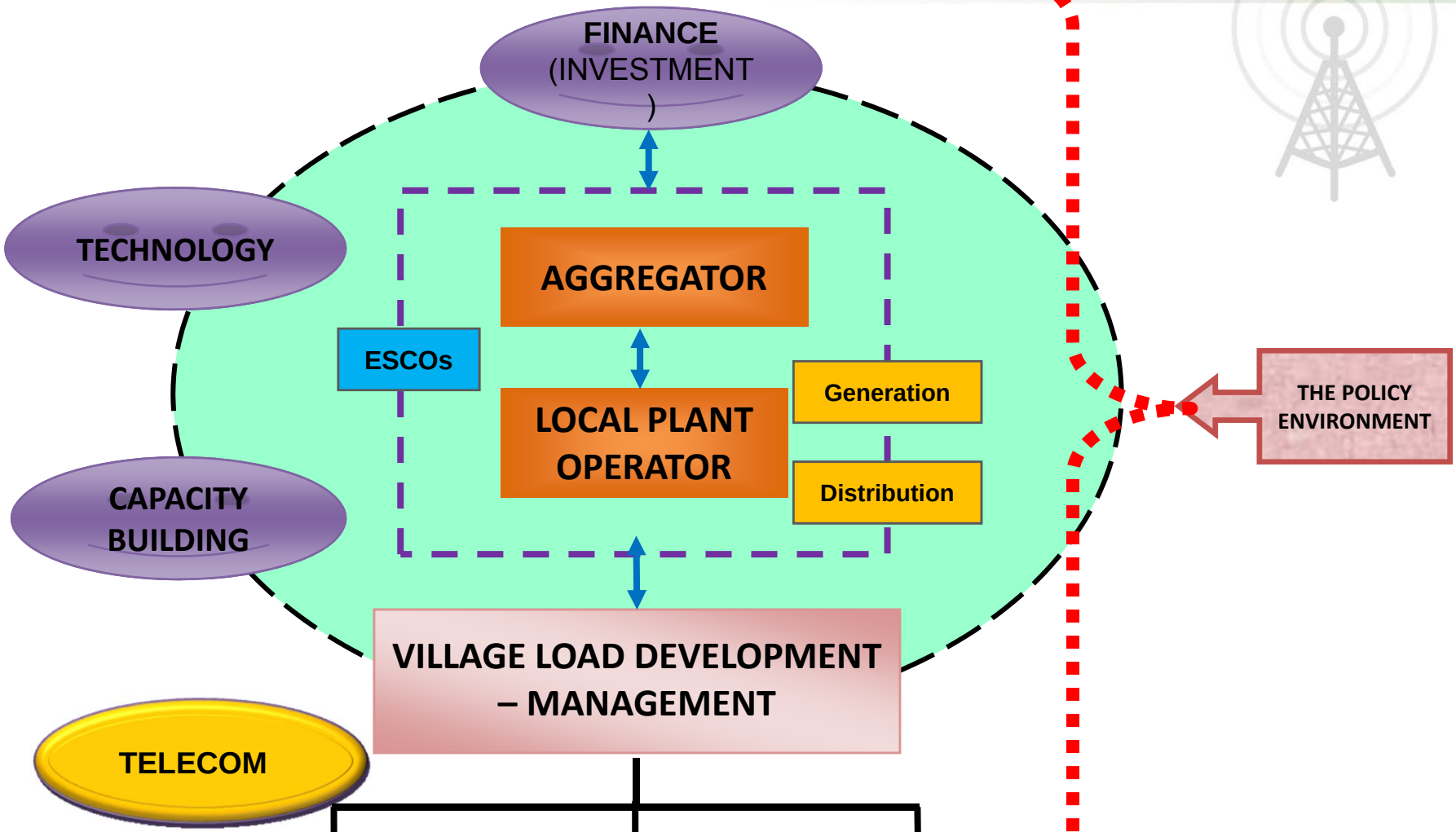
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SPEED ECOSYSTEM & CURRENT STATUS

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SPEED ECOSYSTEM

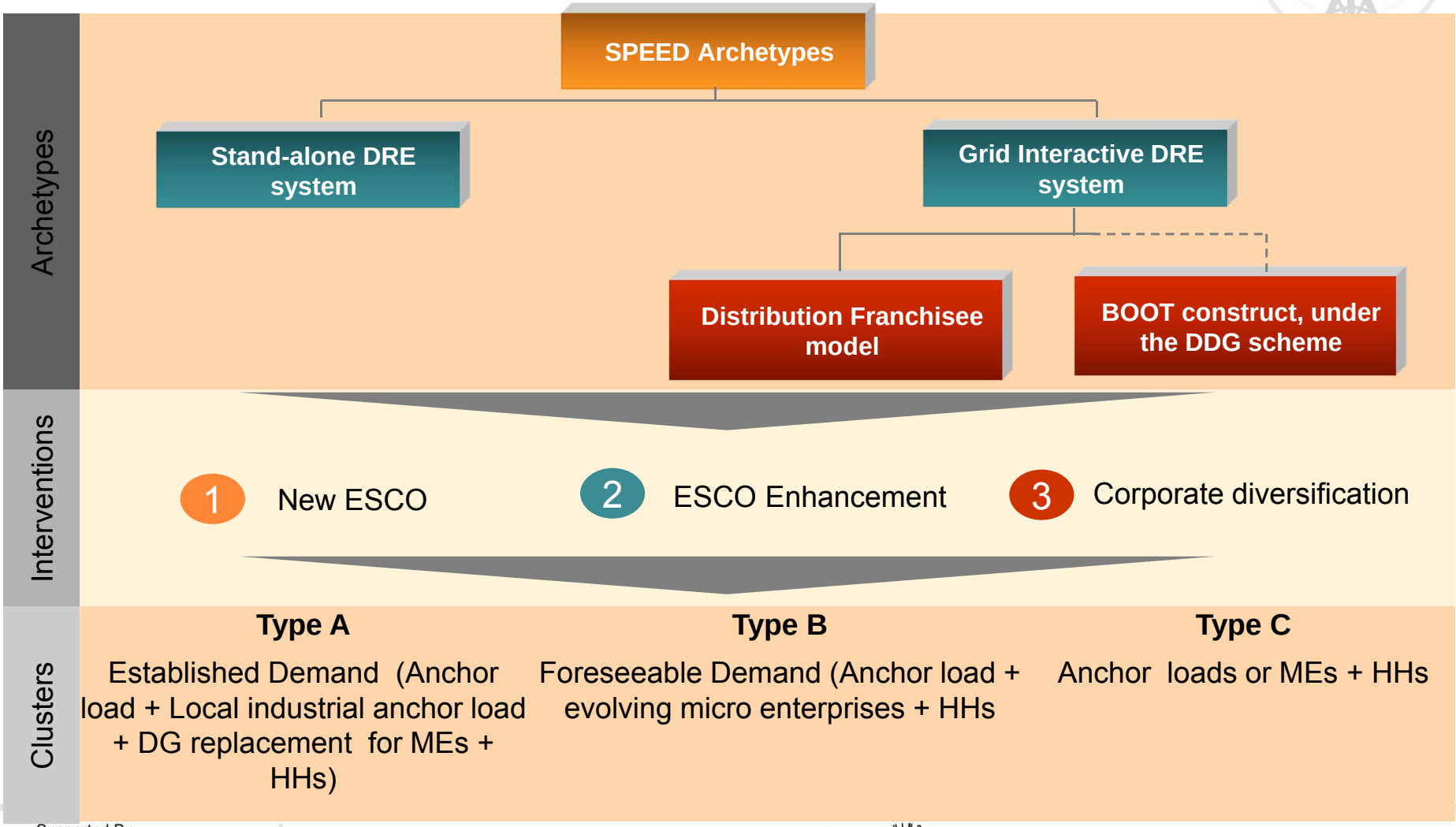
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ESCO Intervention Overview





SPEED Financing Approach

Catalyzing Diverse Financing Approaches

- **Grants** for research, convening, M&E, capacity building, rural enterprise promotion

- **Government and donor finance** for capital expenditures, working capital, technology promotion (grants, loans)

- **Impact investment capital** for early-stage investors - ESCos, technology providers, enterprise promotion (equity, loans, micro-finance)

- **Commercial capital** for expansion (equity, loans)



SPEED
Smart Power for Environmentally-sound Economic Development

SPEED Program for ESCO Financing

Goal: Drive large scale adoption of renewable energy technologies and service delivery models

- Analytical and business advisory support
  - Site feasibility assessment
  - Sizing Optimization & Plant Economics
  - Business case development and Inputs for Business Models
  - Handholding for DPR and/or Business Plan creation
- Cluster development to support business foothold and link-up to demand
  - Tower clients, Interaction with local demand sources
  - Technology suppliers collaboration
- Investor interaction
  - Investor Workshops as also facilitating targeted conversations with FIs
  - Shaping collaboration with other initiatives /schemes in the field
  - Facilitating discussion with IREDA and State Agencies
- Large scale Investor engagement, to attract equity as well as debt capital
  - Guarantee Instrument to motivate lenders (e.g. USAID Partial Risk Credit Guarantee)
  - Line of Credit to local FIs for shaping attractive lending rates to catalyze micro-grid based rural energy market
- Direct access to **SPEED Catalytic Facility**, (for specific site contexts)

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Indicative Returns: Plant economics at a glance

Particulars ↓		Site clusters				
		Type A		**Type B**		**Type C**
Archetype investigated		Stand-alone	Stand-alone	DF tail end gen	DDG construct	Stand-alone
Plant size	kVA	190	55	40	40	25
Technology		Biomass	Hybrid	Biomass	Biomass	Solar
Available power	kW	115	30	25	25	14
Institutional load (tower) price	Rs/unit	18-20	18-20	14-20	18-20	18-20
Microenterprise load price	Rs/unit	12-15	12-15	7-13	5	12-15
Community price		Point basis (avg~20)		3.5 - 5	5	Point basis
Ramp up of tower		3 months		3 months		3-6 months
Ramp up of community load		3 months		3 months		3 months
Ramp up of ME load		3months		6-12months		1-2yrs
Modeled peak load	kW	115	28	25	22	14
Unlevered IRR post subsidy		14%	19%	0 - 11%	8%	16%
Project cost	Rs	22.8m	4.8m	2.8 - 3m	1.3m	3.6m

Extensive work being undertaken to create demand assurance and help shape feasible IRRs

Catalyzing demand through anchor load and local micro-enterprise development

Identification of anchor tenant in order to maintain a minimum PLF for plant and ensure sustenance

Business case varies by capex optimization, storage constraints and nature of load centers

SPEED in Phase 2: 2011 – 2014 Work Plan

	2011-12	2012-13	2013-14
Ground-level demonstrations	Pilot cluster (5 units) Baseline established Partnership with CBO	9 clusters (15 Plants) Evidence of viability Enterprise development Enhanced involvement of CBOs	20 clusters (40-50 units) Range of business models Proven community benefits
Building the Enabling Environment	Regulatory mapping Industry partnerships Technology facilitation	Regulatory momentum New demand aggregators	Integrated Regulations Scaled up power purchase agreements
Finance Mobilization	Convene stakeholders	SPEED equity fund Expansion of new entrants	Increased commercial and public finance

Current Focus

- Implement **successful pilot projects in 30 to 50 villages**
  - demonstrate sustainability of the model
  - create verifiable conditions for its scaling up to 1000 villages or more

- Build an **"ecosystem" around the SPEED** concept by:
  - supporting the spread of scalable, sustainable implementation models
  - engaging critical industry players
  - creating financing models
  - promoting favourable policies

Clusters currently under Development

… 5 states, 9 clusters, 72 towers with 6 ESCOs

Sr. No.	State	Cluster	Villages/ Sites
1	Bihar	Araria	4 Villages (Bara, Lalua Bari, Chakai, Jokhihaat) – 8 towers
		Vaishali	5 villages (Dabaich, Balatar and 3) – 18 towers
2	MP	Kesla	Pradan campus plus 5 Villages (Chakhipura, Kochamau and 4 forest villages) - 6 towers
3	Jharkhand	Peterbar	2 Villages (Merudaru, Etke) – 1 tower
		Hazaribagh	2 villages (Ghurmuja, Gharonda) – 2 towers
4	Chhattisgarh	Korba	5 Villages shortlisted; 10 Telecom Towers
5	Uttar Pradesh	Faizabad	5 Villages shortlisted; 8 Telecom Towers
		Ambedkar Ngr	3 Villages (Rice Mill owners);12 Telecom Towers
		Bundelkhand	5 Villages (Shaguniya Maaf, Tudiyan + 3) – 8 towers

Program Partners

TARA	Ooverall Programme Coordination and Capacity Building, Policy Dialogue, Knowledge Management & Communications.
CII – Godrej GBC	Industry Anchor and Investment Influence.
Pradan	Community Engagement and Micro-enterprise Development.
cKinetics	Analytics, Business Modeling and Investment.
DESI Power	Technology & Innovation partner.
SAIS Energy Resources and Environmental Program	Global Outreach – Finance & Technology
Sambodhi	Monitoring, Learning and Evaluation.
Prayas	Policy Research

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