

# SPEED

## SMART POWER FOR ENVIRONMENTALLY- SOUND ECONOMIC DEVELOPMENT

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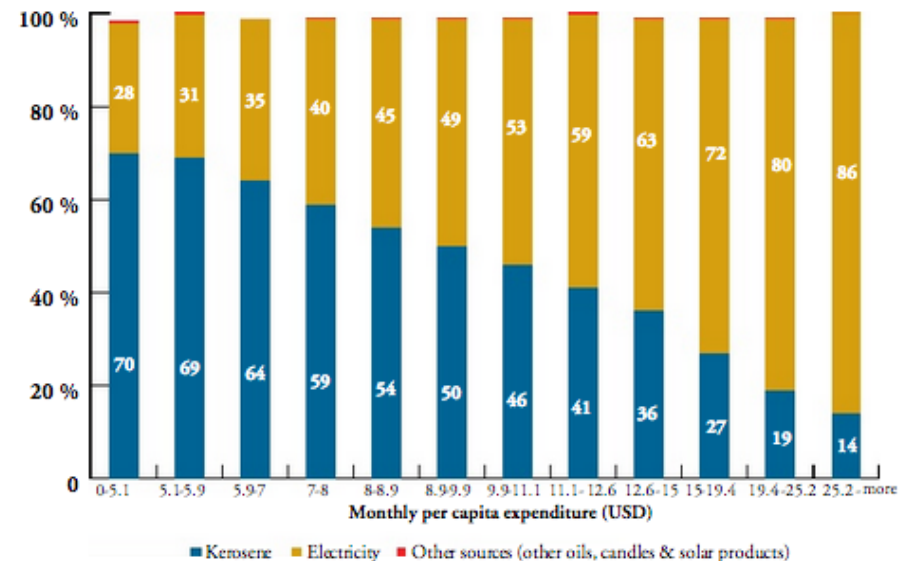
# The SPEED Concept

- ❖ Sponsored by the Rockefeller Foundation, the SPEED program aims to expand livelihoods and enhance quality of life of rural populations by providing ***affordable, reliable, clean energy services for social and economic development.***
- ❖ The initiative harnesses ***telecom towers as “anchor tenants”*** for renewable mini-grids.
- ❖ SPEED is currently being piloted in India and aims to ***stimulate large-scale investment in rural energy services*** in order to drive equitable and inclusive economic growth.

# The Opportunity:

## 400 million people in India lack electricity

- ❖ Approx. 75 million households lack access to electricity
- ❖ Over 60,000 villages remain classified as unelectrified (in reality, even more)
- ❖ Rural households spend \$1.8 billion per year on kerosene for lighting
- ❖ Government spends ~\$4 billion per year on kerosene subsidies



Note: Monthly per capita expenditure is used as an indicator for income  
Source: Energy Sources of Indian Households for Cooking and Lighting (NSSO) (2007), Intelicap analysis

Figure 2.2: Distribution of primary sources of lighting in rural India (2004-05)

# The Opportunity: Capitalize on telecom infrastructure to electrify off-grid communities

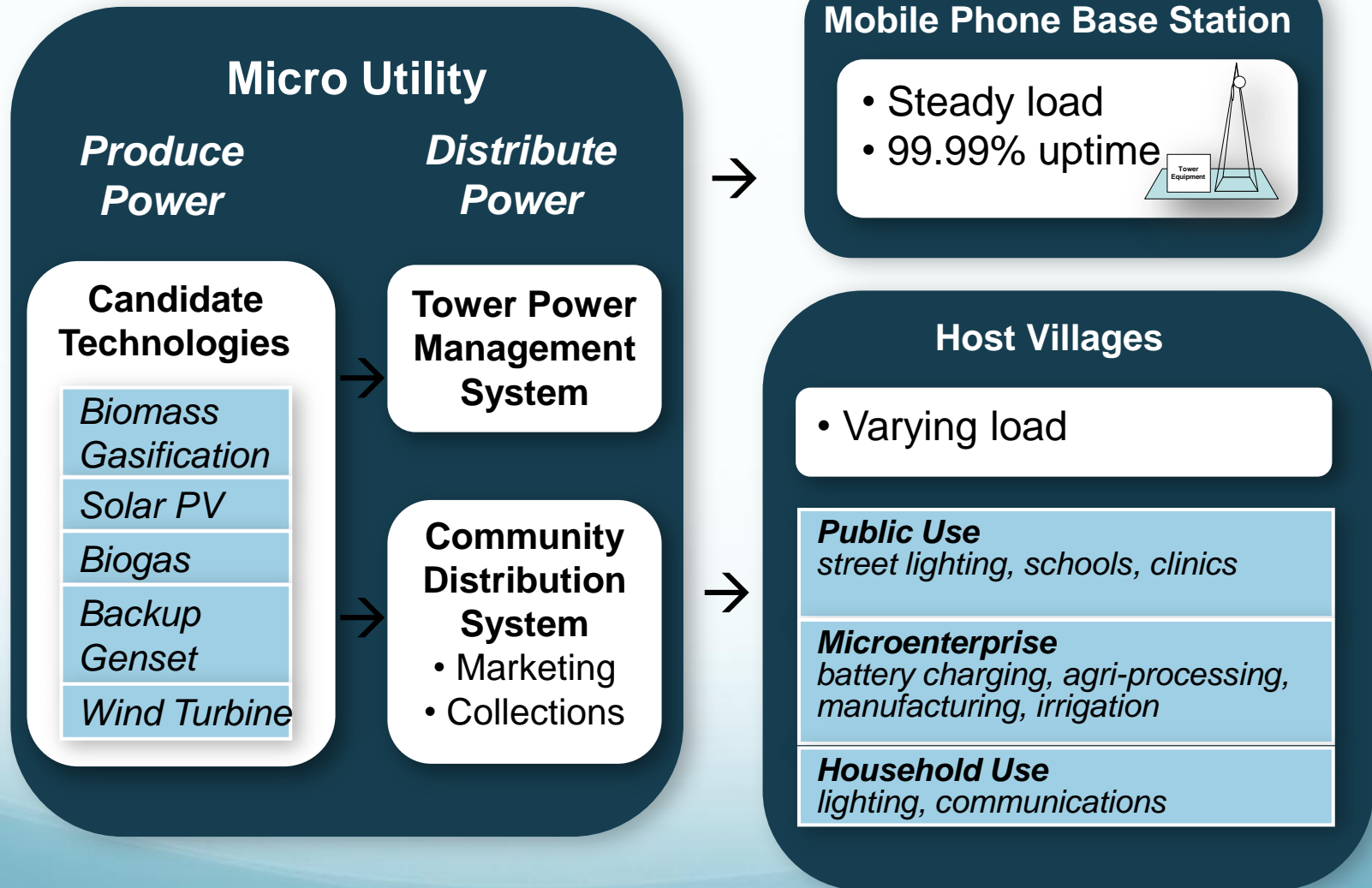
- ❖ India has over 300,000 telecom towers, including 150,000 off-grid towers
- ❖ Vast majority of off-grid towers powered by diesel, which is both costly and polluting



- ❖ **SPEED vision: introduce RE-based mini-grids to green telecom towers while extending energy services to surrounding communities**



# The SPEED Approach – An Integrated Solution

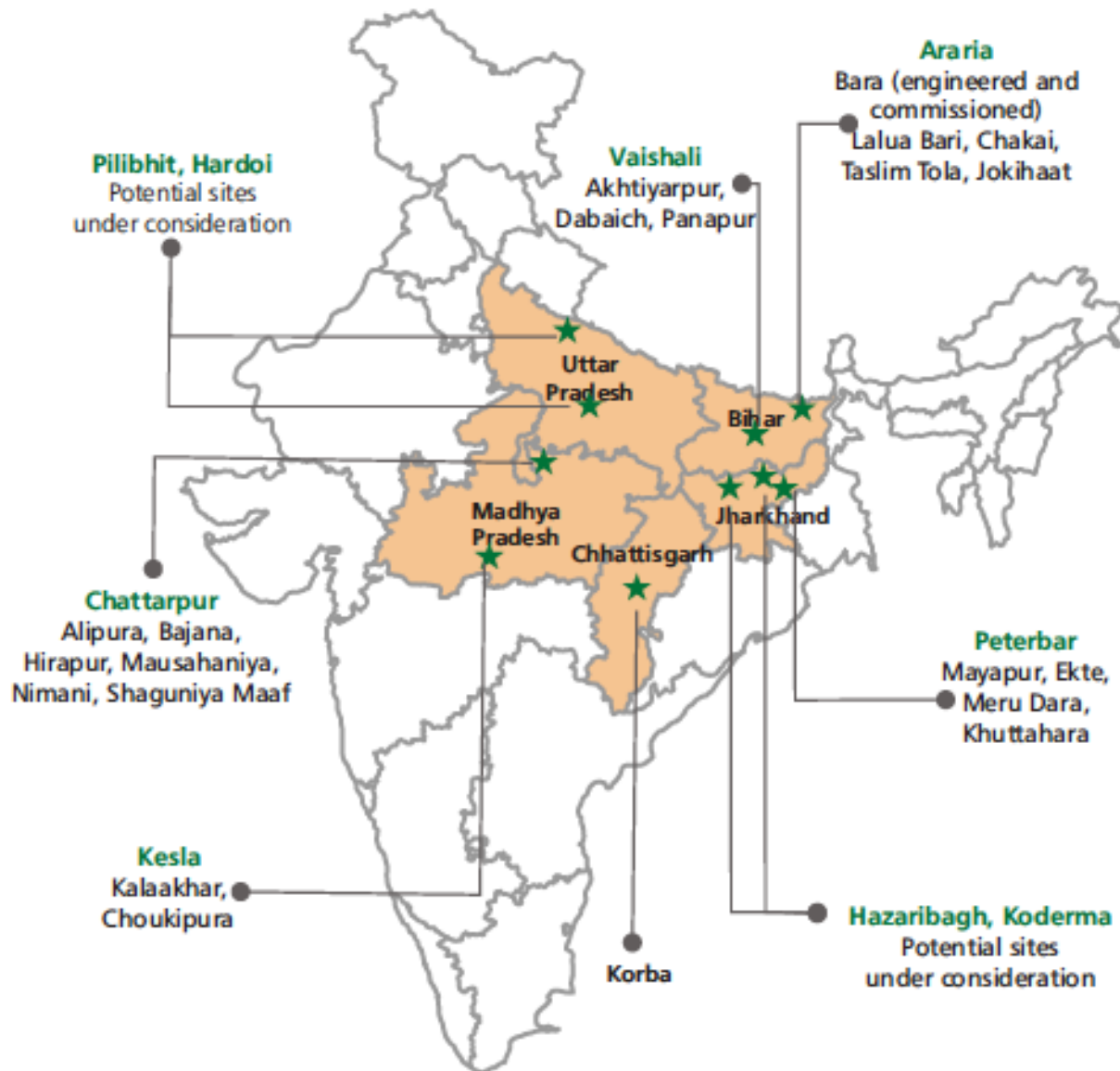


# Project Status and Timeline

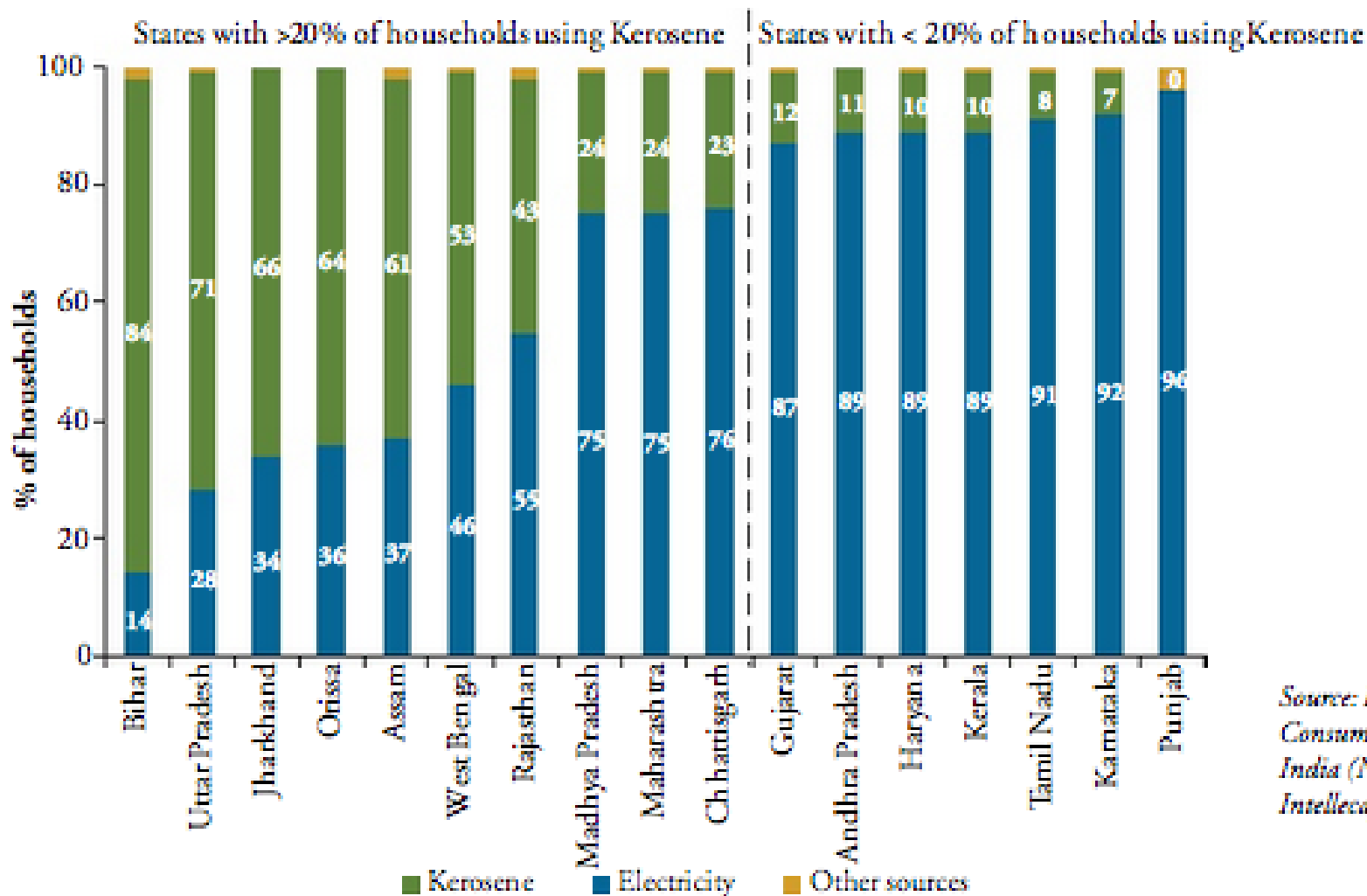
*SPEED connects diverse private companies to village sites*

- ❖ Currently working in 4 states
  - 44 sites identified
  - 9 clusters under development
  - 9 ESCOs engaged
  - 4 NGO partners
  - >70 telecom towers targeted (0-3) per site
  
- ❖ Anticipated rollout of pilots
  - 4-6 by March
  - 12 by June
  - 30-50 villages by 2014

# States and Clusters



# Focus on under-electrified states



Source: Household Consumer Expenditure in India (NSSO) (2010), Intelicap analysis

Figure 2.3: Primary sources of lighting in households across states (2007-08)



# ESCO Engagement and Cluster Development

State	Cluster	ESCOs	No. of Projects	
			Sites Assessed	Sites Committed
Bihar	Araria	DESI Power	5	4
	Saran/ Araria	AST	0	10
	Vaishali	Telesolar	5	2
	Araria	Greenfields	2	4
Jharkhand	Bokaro	G P Green Energy	2	2
	Hazaribagh	AST	3	5
	Koderma	AST	2	5

# ESCO Engagement and Cluster Development

State	Cluster	ESCOs	No. of Projects	
			Site Assessed	Site Committed
Uttar Pradesh	Faizabad	Greenfields	2	4
		Gram Power	1	1
	Bundelkahnnd	First ESCO	2	2
	Jaunpur	AST	1	
Madhya Pradesh	Hoshangabad	Gram Oorja	1	5

# Plant Types

	Type A	Type B	Type C
<b>Local Economic Development</b>	Relatively High	Medium	Low
<b>Load Profile</b>	Assured anchor (e.g., poultry farm, silk production); small local enterprises; irrigation pumps; household lighting	Small local enterprises; irrigation pumps; household lighting	Primarily household lighting; possibly some irrigation; SPEED will support enterprise development
<b>Typical Plant Generating Capacity</b>	> 50 kW	25-50 kW	< 25 kW

# DESI Power – Baharbari biomass plant in Bihar





# Powering Productive Activities



# Pricing System for Baharbari Plant

	Cost to Consumer	Diesel/Kerosene Comparison	Notes
<b>Irrigation</b>	Rs 50/hour of pumping = ~Rs 15/kWh	~ Rs 60/kWh (based on diesel price of Rs 50/L and 1.2 L/hour)	DESI operates 6 pumps at 3kW each
<b>Agri-processing enterprise</b>	Rs 12/kWh	Rs 20-25/kWh	Uses 8-10 hours of electricity daily
<b>Household Lighting</b>	Rs 4-5 per 100W light bulb for 4-5 hours/day = ~Rs 1/hr/bulb		Charge by point of consumption, not kWh; Provide lighting from ~6 pm to 10-11 pm



# Biomass Supply Chain



- 2 acres planted produce ~60 tons/year
- 50 kW plant requires ~400 tons/year



# Chakai: Site Currently Under Development



← Gasifier to power 2 telecom towers, mill, ice factory, market and nearby households

30-35 kW gasifier primarily to irrigate fields →





# Challenges

## ❖ Operational

- Shortage of well trained personnel
- Demand assurance (understanding existing demand and scheduling, developing new demand)
- Revenue assurance (metering, remote monitoring, pre-paid systems)
- Biomass supply chain (seasonality, type, price sensitivity)

## ❖ Financial

- Difficulty of unlocking private sector finance, especially commercial debt
  - Economically viable projects may not be bankable due to: small ticket size, low IRRs, high due diligence costs, unproven business model, policy uncertainty, etc.
  - Employ aggregation strategy: develop portfolios of projects in order to increase ticket size, reduce risk, attract finance, achieve scale

## ❖ Policy

- Uncertain policy environment, e.g., surrounding grid extension, future tariffs
  - Need clear and enabling legal and regulatory environment, including dedicated off-grid renewable energy policies

# SPEED Program Partners

Organization	Function
<b>TARA</b>	Overall Program Coordination and Capacity Building, Policy Dialogue, Knowledge Management, Communications
<b>CII – Godrej GBC</b>	Industry Anchor and Investment Influence
<b>cKinetics</b>	Analytics, Business Modeling and Investment Outreach
<b>DESI Power</b>	Technology & Innovation Partner
<b>Pradan</b>	Community Engagement and Micro-enterprise Development
<b>Prayas</b>	Policy Research
<b>Sambodhi</b>	Monitoring, Learning and Evaluation
<b>SAIS Energy, Resources &amp; Environment Program</b>	Research, Analysis and Global Outreach

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