

Smart Power for Rural Development

By

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The Rockefeller Foundation in India

- A long commitment to funding and working in India since 1920s, significantly increased during the Green Revolution.
- During the past 20 years, the Foundation provided nearly US\$ 100 million to impact the lives of the poorest and most vulnerable people in India.
- Launched the Smart Power for Rural Development initiative in 2015



Decentralized Renewable Energy **mini-grids** have emerged as one the most effective and impactful options because of their ability to provide lighting to households and electricity to businesses.



The goal

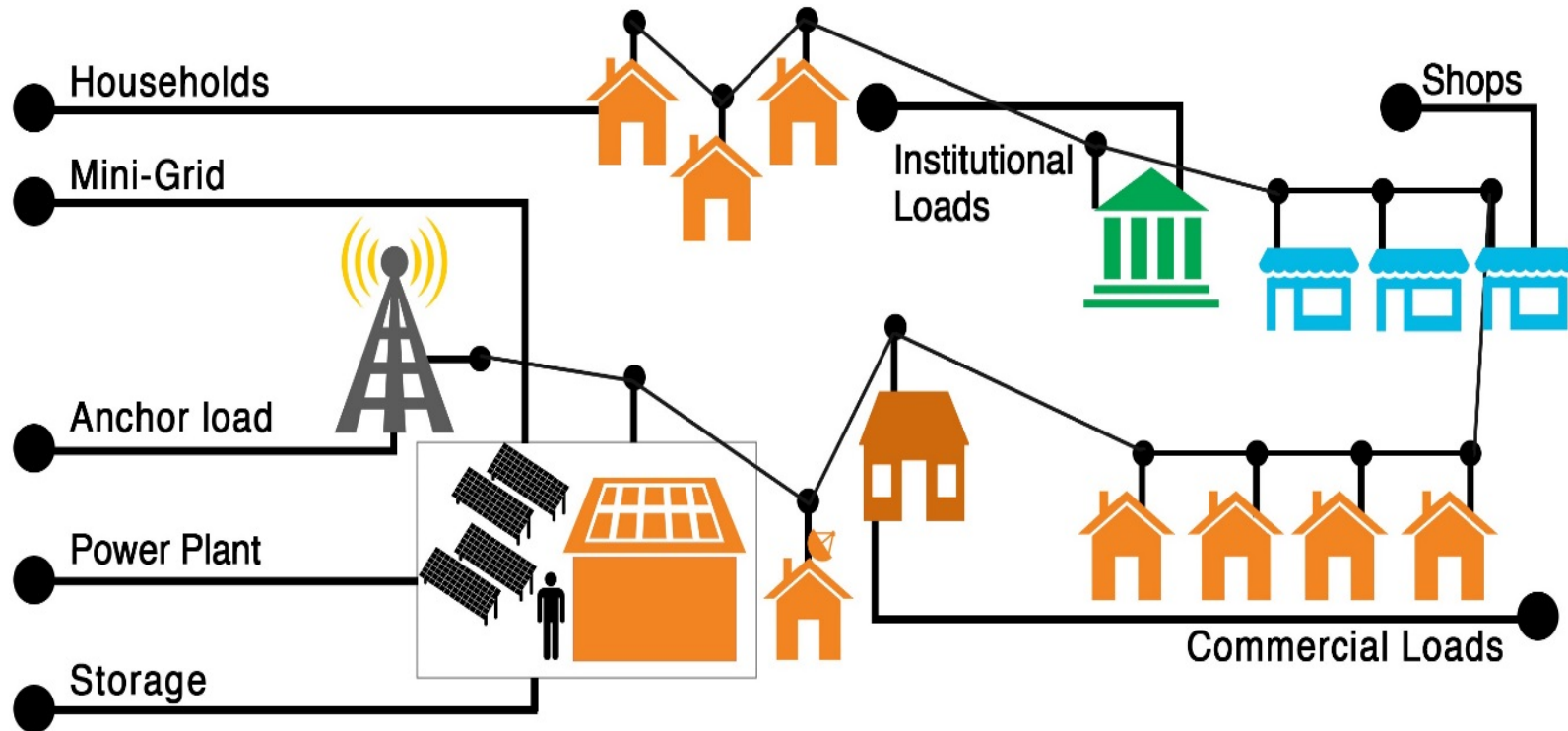
Accelerate inclusive economic growth, community resilience and positive outcomes for poor and vulnerable people in India by catalyzing a rural energy transformation



Smart Power for Rural Development addresses market gaps

Key market gaps	What we do
<ul style="list-style-type: none"> ▪ Limited financing available for mini-grid projects 	<ul style="list-style-type: none"> • Provide long-term debt to ESCOs • Support new financing facilities for mini grids
<ul style="list-style-type: none"> ▪ Grid expansion path is uncertain ▪ Besides Uttar Pradesh, there is a lack of clarity around grid interactivity 	<ul style="list-style-type: none"> • Support policies and regulations for mini-grid market and eventual integration with national grid
<ul style="list-style-type: none"> ▪ Untapped and untested demand ▪ Energy providers lack relationships with rural consumers 	<ul style="list-style-type: none"> • Project development & community engagement • Load development support • Value-chain enterprise promotion • Power Purchase Agreements facilitation
<ul style="list-style-type: none"> ▪ Emerging battery technologies not yet geared to mini grid application ▪ Limited availability of energy efficient appliances 	<ul style="list-style-type: none"> • Investment in innovation (testing of innovative batteries & introducing energy efficiency appliances) • Gather and share learnings and evidence to inform the mini-grid sector more widely

Smart Power model



Invest USD \$6 million in 6 companies



5+ ESCOs in the pipeline

- 83 operating plants in Uttar Pradesh and Bihar
- 13 are under construction
- 2.6 MW (3MW by end of June)
- Average 30 KW/plant
- 2,000+ poles
- 7,600 customers (April)
 - 4,580 households
 - 2,400 shops
 - 520 enterprises
 - 90 cell towers
- 90+% collection efficiency for shops and homes

The SPRD program lays special emphasis on monitoring and evaluation of the SPRD plants

Online Data monitoring system (SIMS)

	Cost-Actual	Cost-Target	Cost-Add	Cost-Drop	% Drop	Actual (kWh)	Target (kWh)	Target (DAYS)	Rev. \$M	Rev. \$M Tar.	Rev. \$M	CE% (DAYS)	CE% (kWh)	Status
W/Basic	678	1,892	25	13	2%	55	129	60	Rs. 60,946	Rs. 92,200	Rs. 38,900	63%	67%	Yellow
W/Advanced	84	102	17	1	1%	15	17	100	Rs. 16,072	Rs. 20,760	Rs. 5,880	37%	51%	Red
Shop Basic	524	1,111	21	34	7%	46	87	150	Rs. 40,776	Rs. 37,940	Rs. 46,960	82%	72%	Green
Shop Advanced	130	73	10	13	30%	20	14	84	Rs. 40,651	Rs. 121,460	Rs. 31,571	78%	77%	Green
Commercial - Appliances (Existing)	127	93	36	0	0%	172	144	22	Rs. 122,573	Rs. 112,210	Rs. 76,394	62%	72%	Green
Commercial - Appliances (New)	0	0	0	0	0	0	0	NA	Rs. 0	Rs. 0	Rs. 0			Red
Commercial - Motor	6	13	1	2	37%	12	15	18	Rs. 15,302	Rs. 48,589	Rs. 25,580	120%	127%	Red
Institutional Load (Existing)	8	12	2	0	0%	19	42	NA	Rs. 20,747	Rs. 30,000	Rs. 16,672	80%	89%	Red
Institutional Load (New)	2	0	2	0	0%	6	0	NA	Rs. 1,860	Rs. 0	Rs. 0	0%	0%	Red
New Meter/connections	0	47	0	0	0	0	271	NA	Rs. 0	Rs. 46,332	Rs. 0			Red
Telecom Tower	2	10	0	0	0%	24	659	NA	Rs. 1,382	Rs. 63,612	Rs. 5,382	100%	97%	Red
Total	1,531	3,187	114	63	4%	371	1,477	64	Rs. 346,699	Rs. 701,802	Rs. 249,029	72%	76%	Red

SPRD Composite Plant Performance

A. SPRD Compliance Indicators

- % GENERATION FROM DG
- % OF COMMUNITY POWER SUPPLIED TO PRODUCTIVE LOADS

B. Business Indicators

- REVENUE (YTM ABSOLUTE)
- OPERATING PROFIT MARGIN %
- COLLECTION EFFICIENCY %

C. Technical Indicators

- UNPLANNED DOWNTIME
- PLANT UTILIZATION VS TARGET
- LEAKAGE %

The program has developed an online monitoring tool (SIMS) for effective monitoring of SPRD sites. The SIMS data is further evaluated using a 3-Dimensional Composite Index. The data is also used to conduct root cause analysis for suggesting corrective actions to ESCOs



17,000 villages
potential for viable mini-grids in UP

USD \$1+ billion
Investment needed