



## THE CHALLENGE

- **400 million people** in India live without grid connectivity with little to no access to power, with **over 90%** located in rural areas.
- Off-grid villagers resort to **burning kerosene** to produce light at night and biomass for cooking.
- The most widely available yet **wasted energy source** in India is agricultural waste.

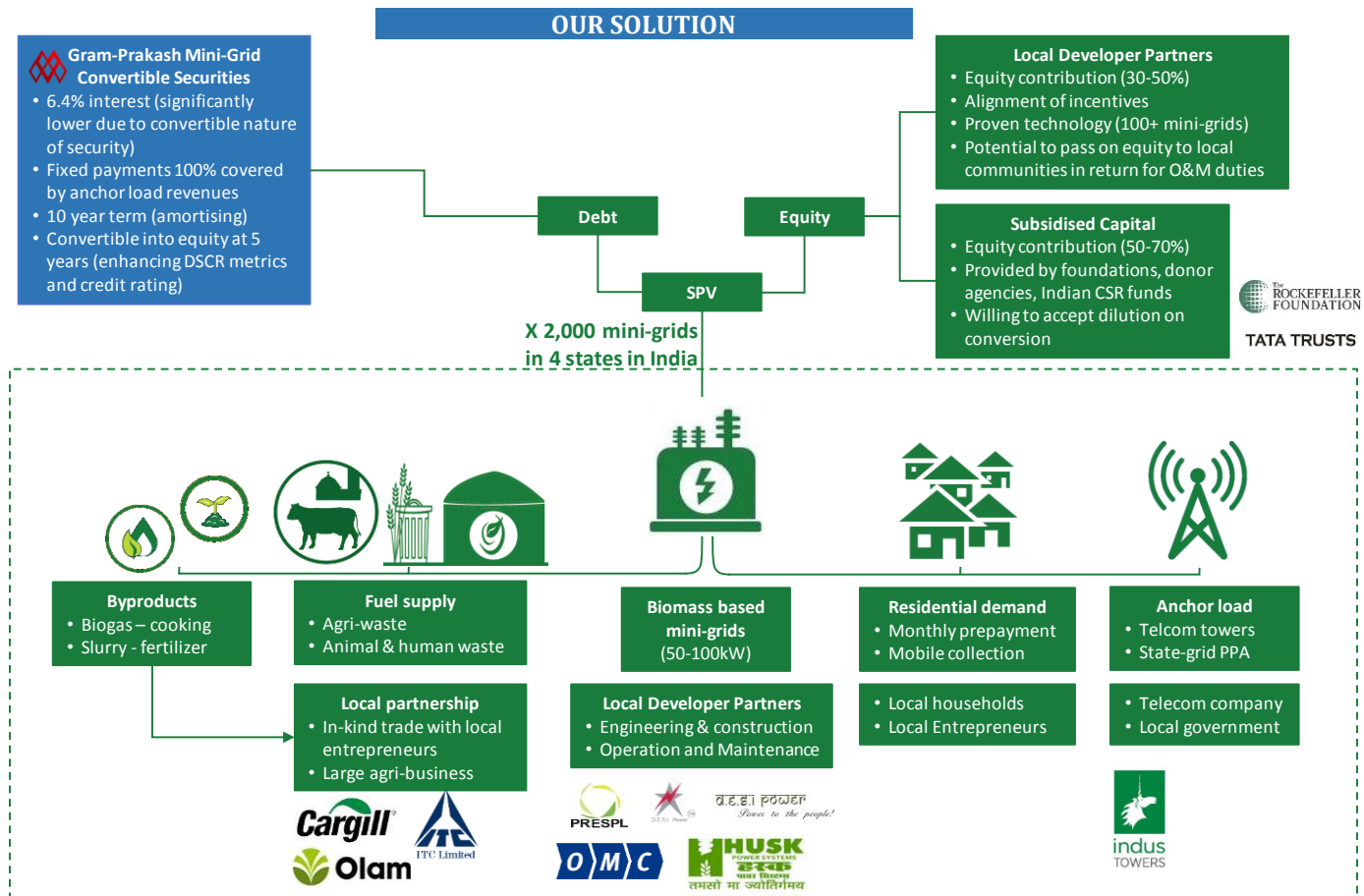
Renewable energy mini-grids are believed to be the solution, however there are significant impediments to achieving this goal, mainly:

- (1) lack of scalable technology and business solution to handle the heterogeneous social and environmental conditions
- (2) poor revenue realisation from users
- (3) unreliable energy feedstock supply chain
- (4) lack of local community ownership and inadequate O&M

## THE OPPORTUNITY

A combination of vast population eager for electricity as a means of poverty reduction, pro-economic growth and pro-renewable government agenda as well as proven technology and business practices on the ground point to strong potential for attractive and scalable investment opportunities.

Pro-investment conditions	Implications
<b>Huge market size</b>	400 million people in India without electricity, 33,000 villages in candidate pool
<b>Favourable public objectives</b>	Mini-grids identified as a key means to achieve full electrification by 2022 Public sanitation and pollution control policy Corporate Social Responsibility (CSR) policy
<b>Proven technology and business practices</b>	Technology and best business practices have been established on the ground
<b>Affordable alternative to current electricity supply</b>	Diesel generation costs nearly triple of biomass electricity, and therefore high willingness to pay (WTP)



## SOCIAL IMPACT

Desired Impact	Measurement	Expected outcome
<b>Sustainable access to electricity</b>	No. of houses, hydro pumps, shops with 7 hours of electricity every day	Each mini-grid supports 1000 households, 10-20 pumps, 5-10 shops
<b>Improve household income and productivity</b>	Annual household income in Rupees/year	Average household income increases by 30%

<b>Create work opportunities</b>	Total no. of jobs created by underlying assets	12,000 jobs in O&M and supply chain with tested training programs
<b>Reduce pollution and manage human/animal waste</b>	CO <sub>2</sub> emission reduction in tonnes/year	Reducing 600,000 tonnes of CO <sub>2</sub> emission/year
<b>Improve health and education</b>	Study time; medical costs	2 hours/day increased study time; 15% reduced medical costs

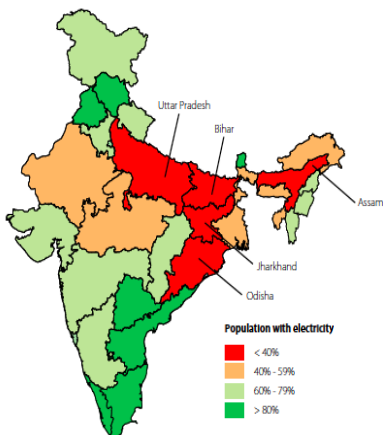


## POSITIVE POLICY DEVELOPMENTS

- The 24x7 Power For All joint initiative between federal and state governments seeks to supply all retail and commercial consumers of power by 2019 (excluding isolated villages)
- Two draft policy proposals currently under review seeking to clarify mini grid standing within larger electricity generation network
- First state level policy for mini grids introduced by Uttar Pradesh in 2016

## GEOGRAPHIC FOCUS

Initially the fund will invest in states with very low electrification rates (ex.: Bihar, Jharkhand, Madhya Pradesh, Uttar Pradesh, West Bengal, Odisha) where there is little likelihood of main grid extension. It will also focus on states with existing minigrad policies (Uttar Pradesh) to reduce regulatory uncertainty.



## VILLAGE DEVELOPMENT CRITERIA

There are 33,000 rural villages from four states of India that could greatly benefit from stable and affordable access to electricity.

Four criteria are established to identify villages that will be best suited for such investments.

Investment Criteria	Preference
<b>Current grid-connection</b>	No planned grid-connection; essentially a natural monopoly
<b>Resource availability</b>	Biomass readily available within 7km to control costs
<b>Willingness to pay (WTP)</b>	Current reliance on diesel generators implies high WTP (20c-30c/kWh)
<b>Government efficiency</b>	Pro-renewable local government for max support

## GRAM-PRAKASH SECURITY OVERVIEW

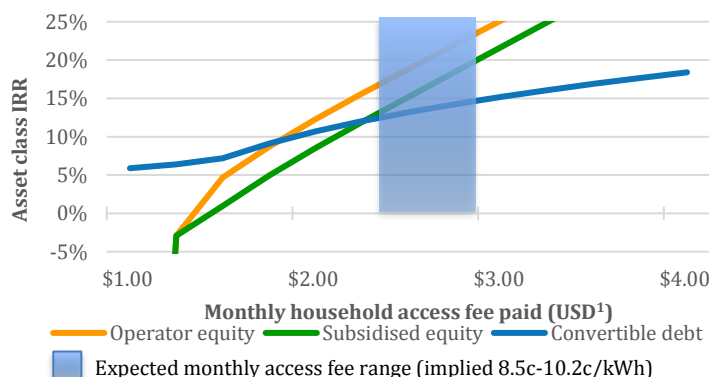
<b>Asset Class</b>	BBB-/BB+ grade convertible debt security
<b>Fund Size</b>	US\$100M, sufficient to catalyse 2,000 projects in villages at 50% leverage
<b>Target return</b>	12%-15% (local currency)
<b>Management fees</b>	1.0% + 20% return over 8%
<b>Fund Maturity</b>	20-25 years
<b>Term</b>	10 years, with option to convert to equity after 5 years. Subsidised equity capital willing to accept additional

	economic dilution in event of conversion (still likely to receive 15%+)
<b>Interest rate</b>	6.4% (10 year Indian govt bond rate)
<b>Underlying asset</b>	<ul style="list-style-type: none"> <li>• Income generating mini-grids are pooled to form SPV.</li> <li>• Primary revenue counterparty (25% capacity allocation) to be investment grade Telco firms</li> <li>• Strong partnership with preferred operators within target States with successful projects underway</li> <li>• Fund expected to invest in 5-10 separate SPVs (across various States and operating technologies)</li> </ul>
<b>Target investors</b>	Pension funds and insurance companies seeking to expand exposure to impact investments
<b>Hedging</b>	Product will remain unhedged
<b>Credit rating</b>	Target BBB-/BB+ rating, with long term offtake agreements with anchor tenants to cover O&M and debt financing costs.

## KEY INVESTMENT CASE ASSUMPTIONS (USD)<sup>1</sup>

Capex cost	\$1890 / KW	Approx. household energy consumption	30 KWh / month
Indicative plant size	50-100 KW	Feedstock cost	\$41.28/T
Capacity factor	60%	Feedstock usage (p.a.)	259-518T
Anchor capacity utilisation	25%	Feedstock escalation	5.0% p.a.
Anchor tariff (PPA)	20c / KWh	Operations & maintenance expense	5% of revenues
Household access tariff	\$2.50-\$3.00 / month	Marketing & admin expense	5% of revenues

## SENSITIVITY OF RETURNS TO HOUSEHOLD ACCESS FEES



## RISKS AND PROPOSED MITIGANTS

<b>Feedstock availability &amp; security</b>	<ul style="list-style-type: none"> <li>• Partner with large agri-business</li> <li>• Co-ownership of plants with local communities for stable biomass supply</li> </ul>
<b>Revenue stream uncertainty</b>	Secure anchor users <ul style="list-style-type: none"> <li>• telecom towers</li> <li>• local public/private businesses (schools, clinics)</li> </ul> Prepaid mobile collection for residential consumers
<b>Policy and regulation change</b>	<ul style="list-style-type: none"> <li>• Partner with well established local companies</li> <li>• Political risk insurance (Arbitration Award Default)</li> </ul>
<b>Unreliable plant maintenance</b>	Long-term O&M contract with reputable counterparty. Utilize proven low-cost technologies with optimised design solution (50-100kW)
<b>Competing technologies</b>	Open to integrate other technologies later as they become cost-effective. Currently biomass energy is most cost-effective energy solution with LCOE at 6c-8c/kWh

<sup>1</sup> USD figures used rather than IDR for ease of comparability in prospectus.