



THESIS-DRIVEN INCUBATION

Karthik Chandrasekar, Founder & CEO, Sangam Ventures

5th June 2017 | ADB





Sangam Ventures

Energy | Innovation | Capital

Sangam invests in seed and early stage enterprises that improve access to sustainable energy and increase resource productivity leading to inclusive development and creation of communities that are resilient to climate change

Setup in partnership with



We Target Underserved Markets

We invest in enterprises solving global problems
with India as an initial target market

New Energy
Consumers



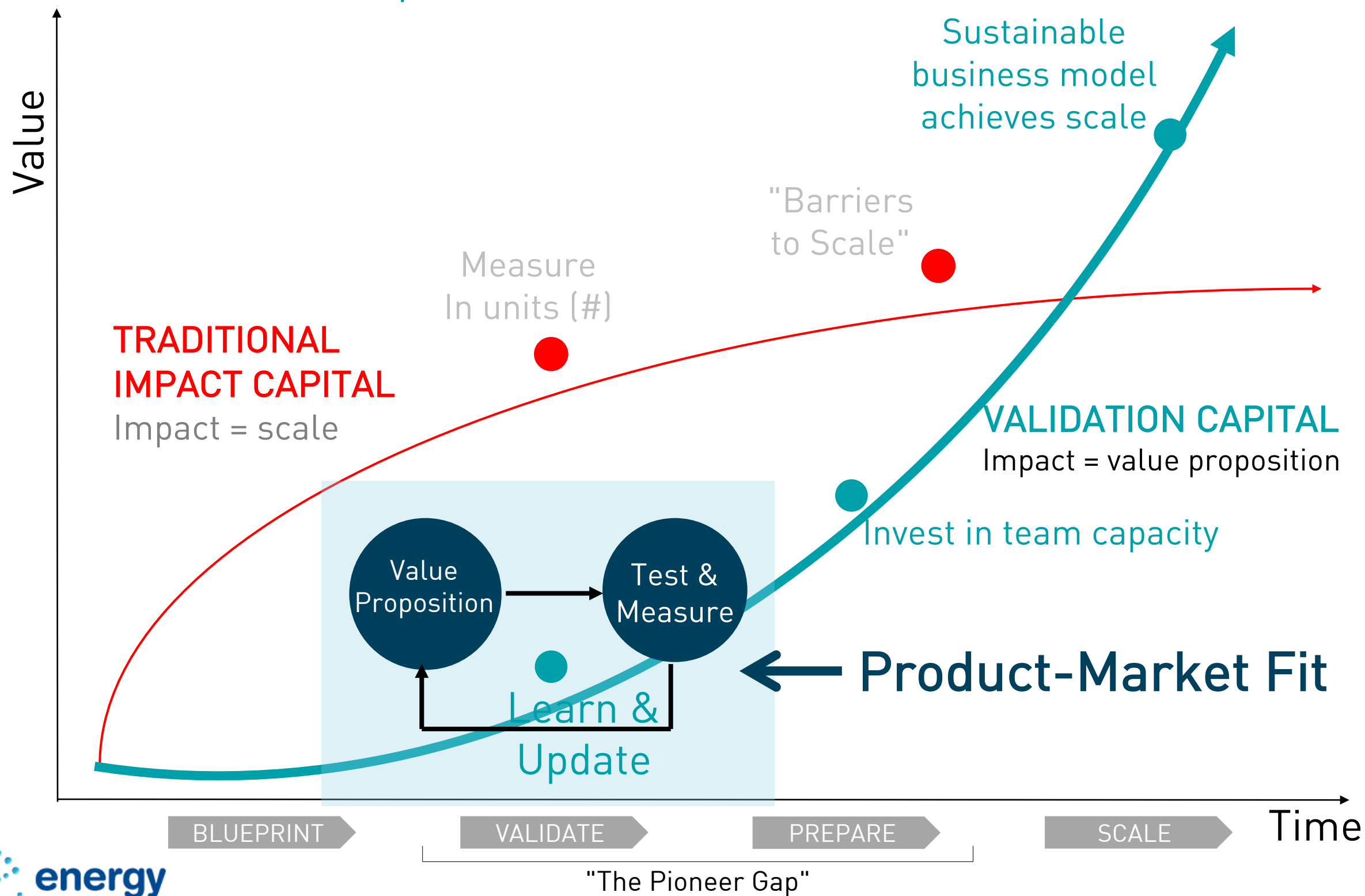
Small & Medium
Enterprises



Communities affected by
climate change &
resource depletion

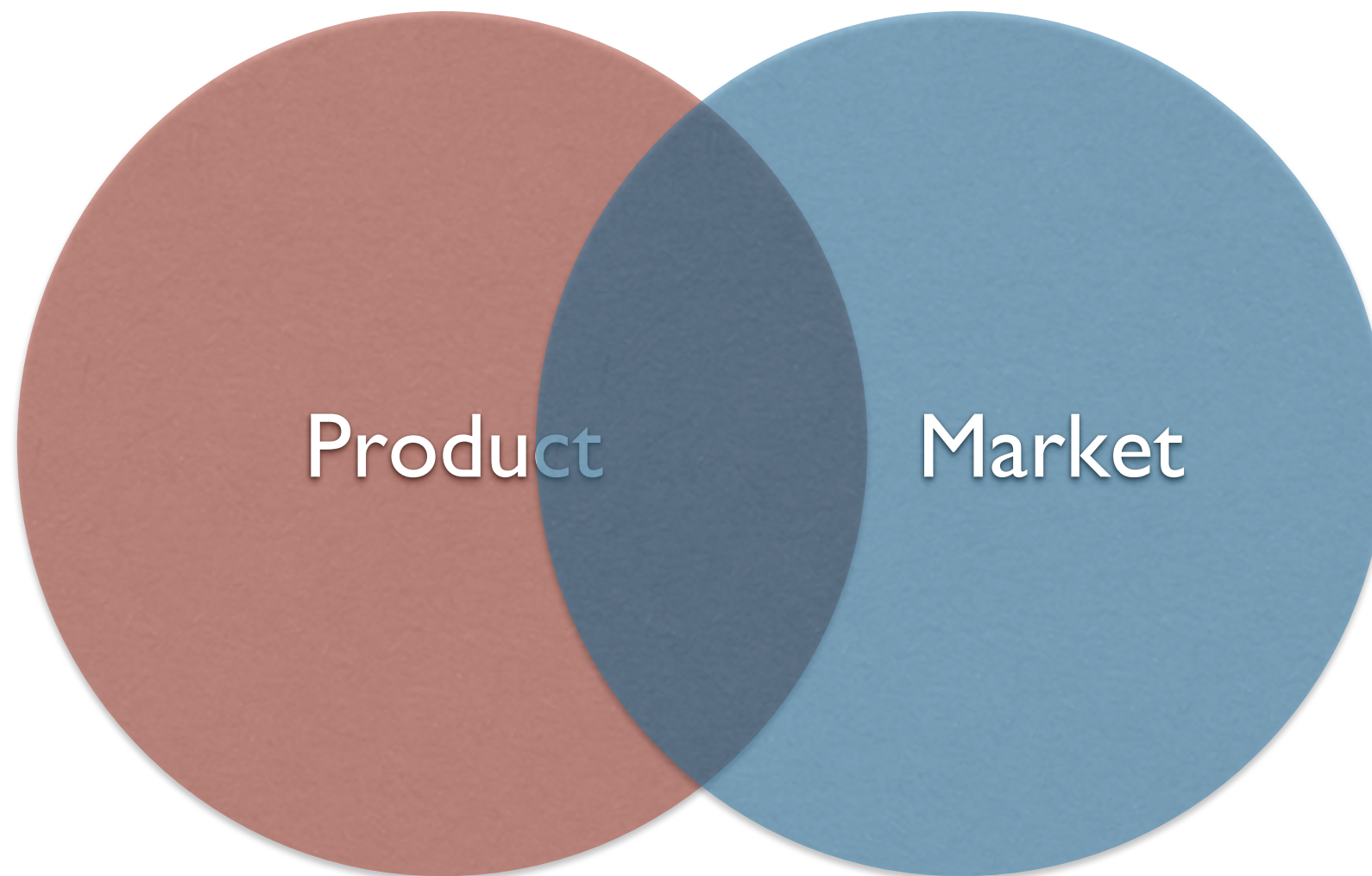


1st step towards solutions that scale



Product-Market Fit

1st step towards solutions that scale



Components of impact framework at early-stage

- The singular focus before Product-Market Fit is getting to Product-Market Fit
- We are not yet talking about units sold or lives reached! We think about and evaluate progress before Product-Market Fit across these key components that drive impact:

Components	Key question	What to track
Additionality	Is this a different approach to fixing something that is broken?	<ul style="list-style-type: none"> ▪ Well-defined customer problem statement in overlooked area ▪ Understanding of prior attempts at solutions
Affordability	Is this affordable to underserved customers?	<ul style="list-style-type: none"> ▪ Improvements in price/performance ratio allow greater affordability & expansion of the addressable market ▪ Ability to efficiently absorb capital and reach a large customer base
Accessibility	How easily can customers get a hold of the solution?	<ul style="list-style-type: none"> ▪ Well-defined target customer segment ▪ Clearly defined channels and business models to reach the target market
Availability	Is this a reliable solution with robust value proposition?	<ul style="list-style-type: none"> ▪ Can the product / service be relied upon by the customer – good quality, reliability and level of customer service ▪ Does the startup have the bandwidth to engage with customer to get feedback on what is critical and what to change

Committed team working hands-on with early-stage startups



Karthik Chandrasekar

Founder & Partner

Leads all fund activities. Previously with Acumen, TVS Capital. BTech, IIT Bombay, MPA, CMU, MBA, Chicago Booth.



Ramesh Ramaswamy

CFO

Ramesh brings strong experience in operational financing for cash and WC management. Most recently, he was CFO, InKlude Labs



Anisha Patnaik

Venture Partner, Legal Counsel

Founder at LexStart, serves as our legal counsel. Previously partner at K-Law and legal counsel at Acumen.



Starlene Sharma

Principal, CEO, Incubation

2-time entrepreneur (Spatial Ideas and V-OPT), investor (Landmark Advisors) and consultant to social enterprises. NYU Wagner MPA and ESADE Business School, Ex-MBA.



Aritra Bhowmik

Senior Analyst

Focus on product development assistance and field operations with startups. Joins us from PR Clean Energy



Shashank Agrawal

Analyst

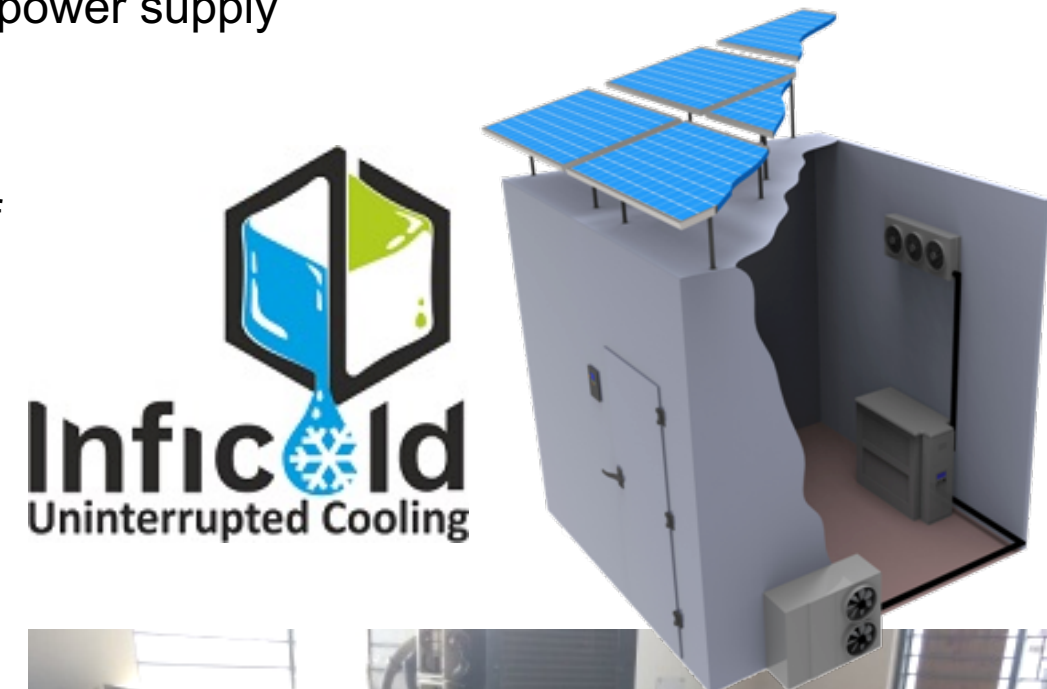
Leads financial diligence and management. Certified CA, previously with E&Y.

Thermal battery by Inficold will enable affordable access to cooling & refrigeration for off-grid customers

Inficold is a thermal energy storage company developing affordable power backup solutions for air conditioning and refrigeration applications for customers with unreliable power supply

The Problem:

- 43% of on-grid customers (379M) face power outages of 6+ hrs/day, driving a \$3B/yr UPS & inverter market
- Traditional battery storage is inefficient for high-energy (and high-power) cooling load, so backup is provided through expensive, dirty diesel gen-sets



The Solution:

- Inficold stores energy in a thermal battery (water in the form of ice); core innovation is easy integration into any existing vapor compression cycle (uses same refrigerant, compressor, condenser)
- System provides direct grid cooling, battery charging (ice freezing), and battery discharging (off-grid cooling)

Inficold Thermal battery provides ~ 6hrs of backup power for 1.5T cooling at 83% lower cost/kWh of backup vs. diesel or 25% of cost of Lead Acid Batteries



Promethean converts waste heat into useful energy to improve industrial & commercial energy efficiency

Promethean Energy develops systems to recover waste heat and reduce fuel consumption across industries such as chemicals, textiles, dairy, food, and hospitality.

The Problem:

- In India, industry accounts for ~1/3 of total energy consumption, of which an estimated 20-50% is lost as waste heat (varies based on industry)
- For every 100 units of cooling energy provided by a chiller, ~125 units of energy are dissipated to the environment

The Solution:

- Range of waste heat recovery (WHR) products for chillers, air compressors, & waste hot air that also improve system performance (e.g. 20% lower chiller power consumption)
- Waste heat recovered is 75-90°C (wide applicability across industries) & payback periods are 6-20 months

Energy efficiency is a better investment for increasing overall energy availability than energy generation



Carbon Masters is capturing organic waste and flared biogas and replacing fossil fuel use

Carbon Masters has developed a business model for bottling and sale and use of biogas in kitchens, automobiles and agro-industries reducing harmful Methane and CO₂ emissions

The Problem:

- Biogas naturally improve access to energy but have languished in India due to lack of supportive policy & infrastructure
- The lack of institutionalized business models and capital intensive nature of the business keeps venture capital investors away
- Traditional biomass accounts for over 80% of energy consumed in rural India and most of the black carbon and Methane (GHG is 21x CO₂) released



The Solution:

- Carbon Masters is specifically focused on developing institutional linkages between producers of biogas - agro-industries (lot of whom flare the gas) and consumers of biogas for cooking, transport and back-up power
- Their main focus and innovations are to solve the supply chain and usability issues related to biogas use, for e.g. they have developed a unique cascade system and biogas tanks to ensure ease of use and higher utilization of the gas in commercial kitchens

Opportunity for biogas as a flexible fuel and energy store is largely untapped because of business failure

Distinct Horizon helps farmers save on Urea - biggest driver of food security and largest consumer of natural gas

Distinct Horizon is developing a Urea Deep Placement (UDP) Applicator that drastically reduces the labor cost of UDP which is the key barrier to the adoption of UDP in India and other emerging markets

The Problem:

- Without synthetically manufactured Urea the earth would only be able to support a population of 2 billion people
- Urea is extremely subsidized in India with the government unable to bear the burden with backlogs to industry of over \$1.1 billion dollars
- Urea consumers approximately 12% of the countries Natural Gas and the process for generating Urea is extremely energy intensive
- IFDC (International Fertilizer Development Corporation) has developed UDP, which involves briquetting of Urea and placing it deep in the soil to improve productivity of Urea by almost 2x productivity across emerging markets outside of India, labor shortage and cost are the biggest barriers to scaling the adoption of the technology

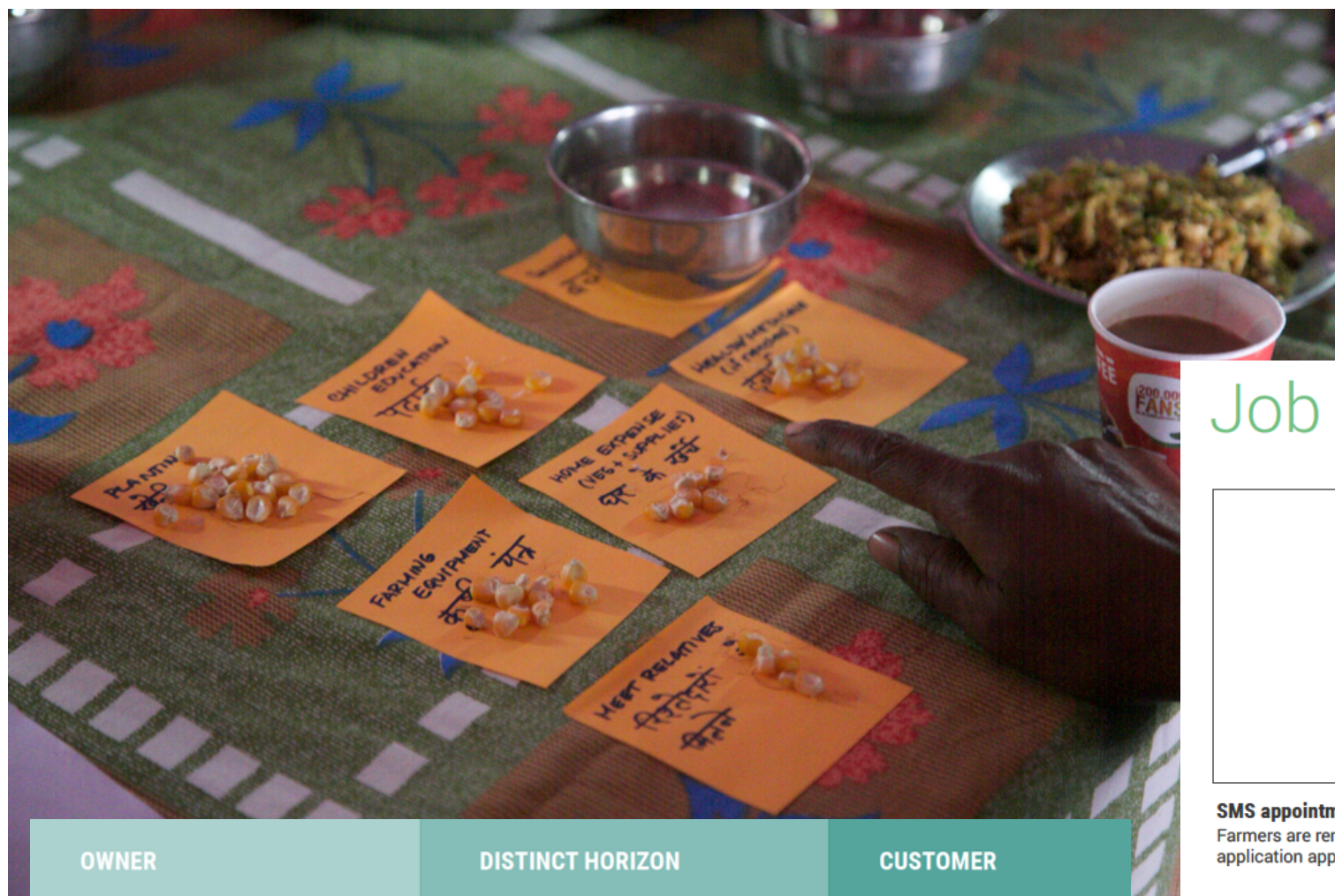


The Solution:

- Distinct Horizon in collaboration with Tata Chemicals has created a UDP applicator which brings down the labor cost associated with UDP by 80%

At scale the company can save India 6% of its Natural Gas production

We partnered with IDEO.org to bring HCD to our portfolio, pipeline and incubation



Our incubation assistance happens where the customers are!

Job Execution



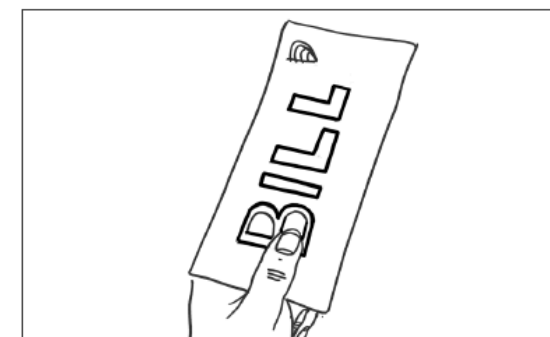
SMS appointment reminder
Farmers are reminded via SMS of their upcoming application appointment. They can reschedule if needed.



Operator arrives at the farm
The operator arrives on the farm and greets the farmer (if he's present). The operator explains the service.



Bill is adjusted with remaining or additional inputs
The operator keeps a buffer of briquettes in case additional are needed to complete service. He keeps any excess.



Farmer is given a bill for the service cost
The farmer receives an adjusted bill with a credit for unused inputs or additional fee for extra briquettes. He pays later.



Driving disruption across the energy market

- + Cleaner
- + Safer
- + More Reliable

- + Affordable (including financing)
- + Best in class customer service

Grid, LPG



10¢/KWh

Distributed systems



20¢/KWh

Household system



60¢/KWh

Customer service

Service & infrastructure

High cost and health issues

Traditional solid fuels and kerosene



Consumer durables

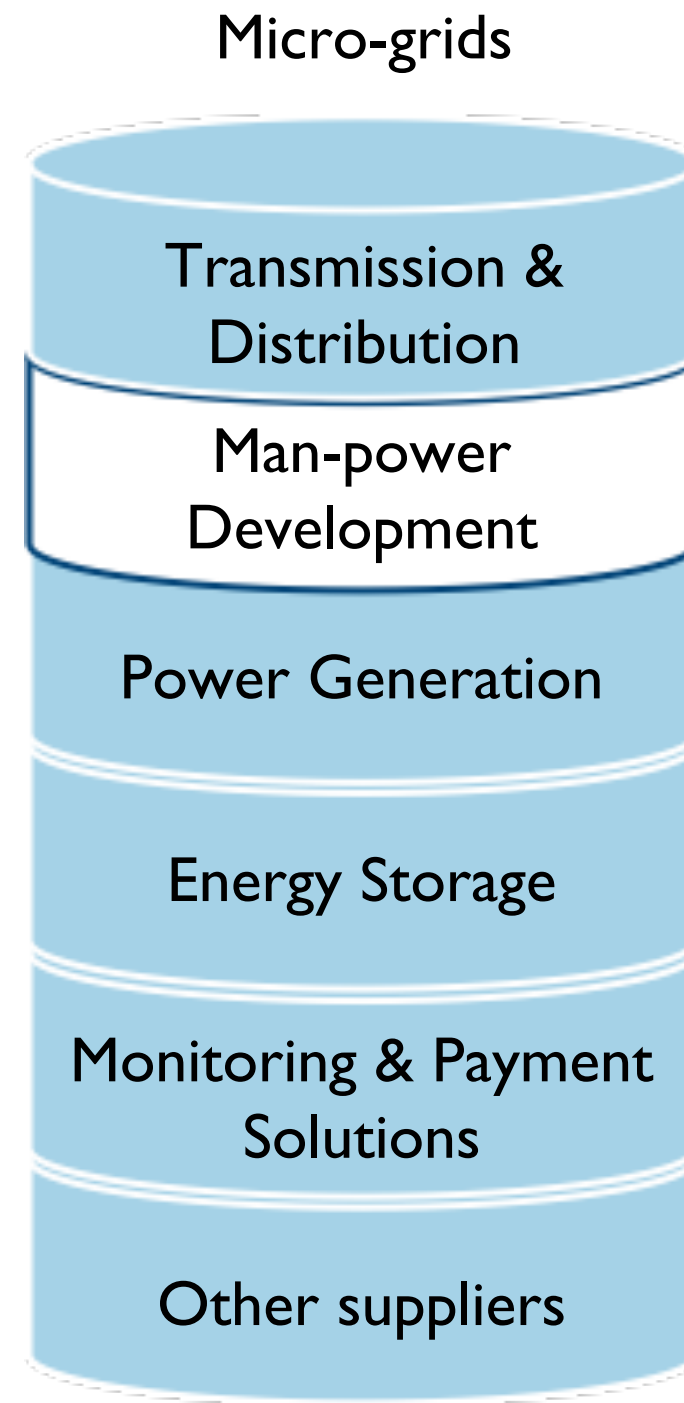
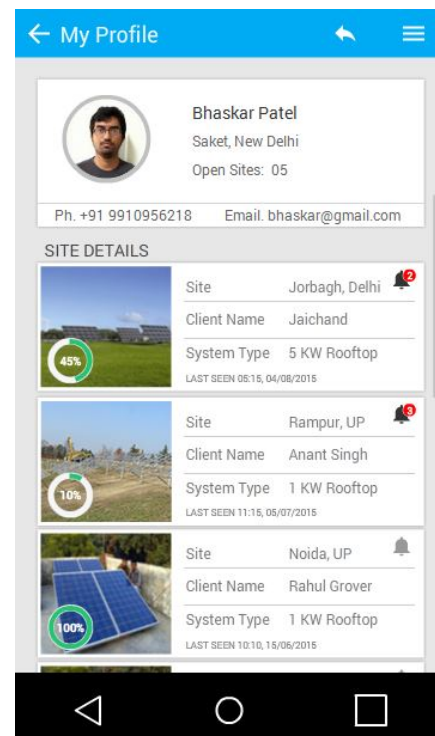
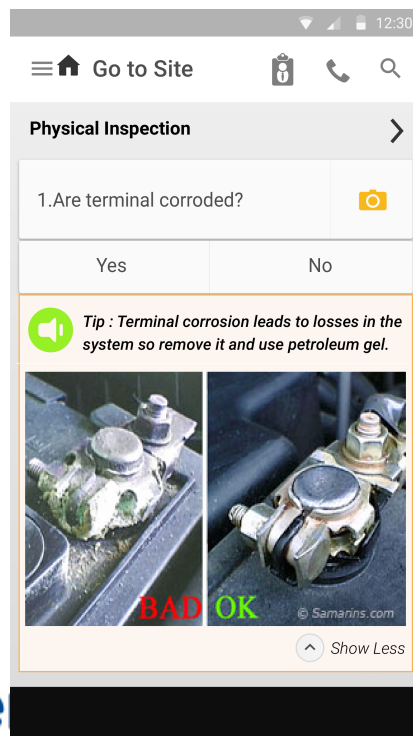
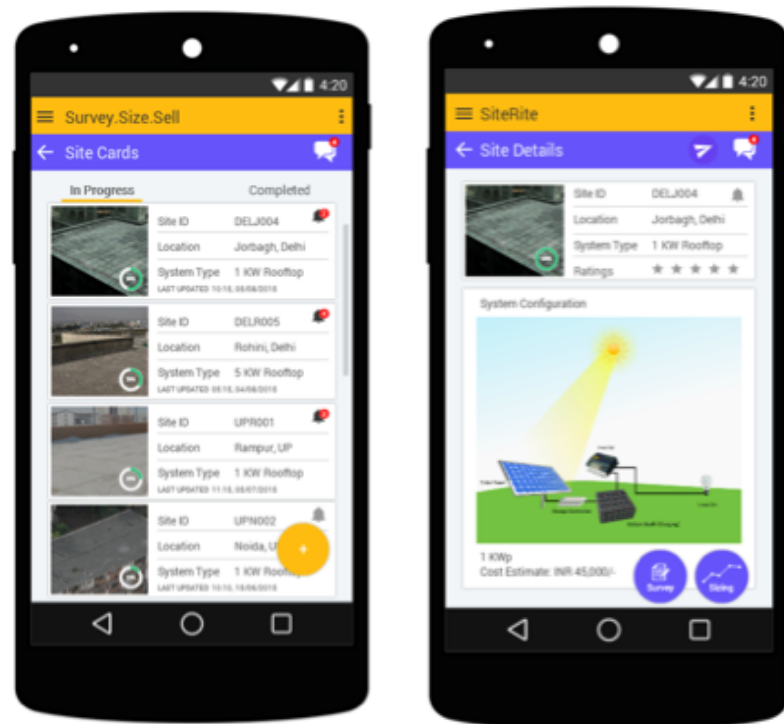


\$2 /KWh

Products & distribution

Moving up the Energy Access Ladder

AnthroPower is filling the gap of trained manpower in the distributed energy value chain

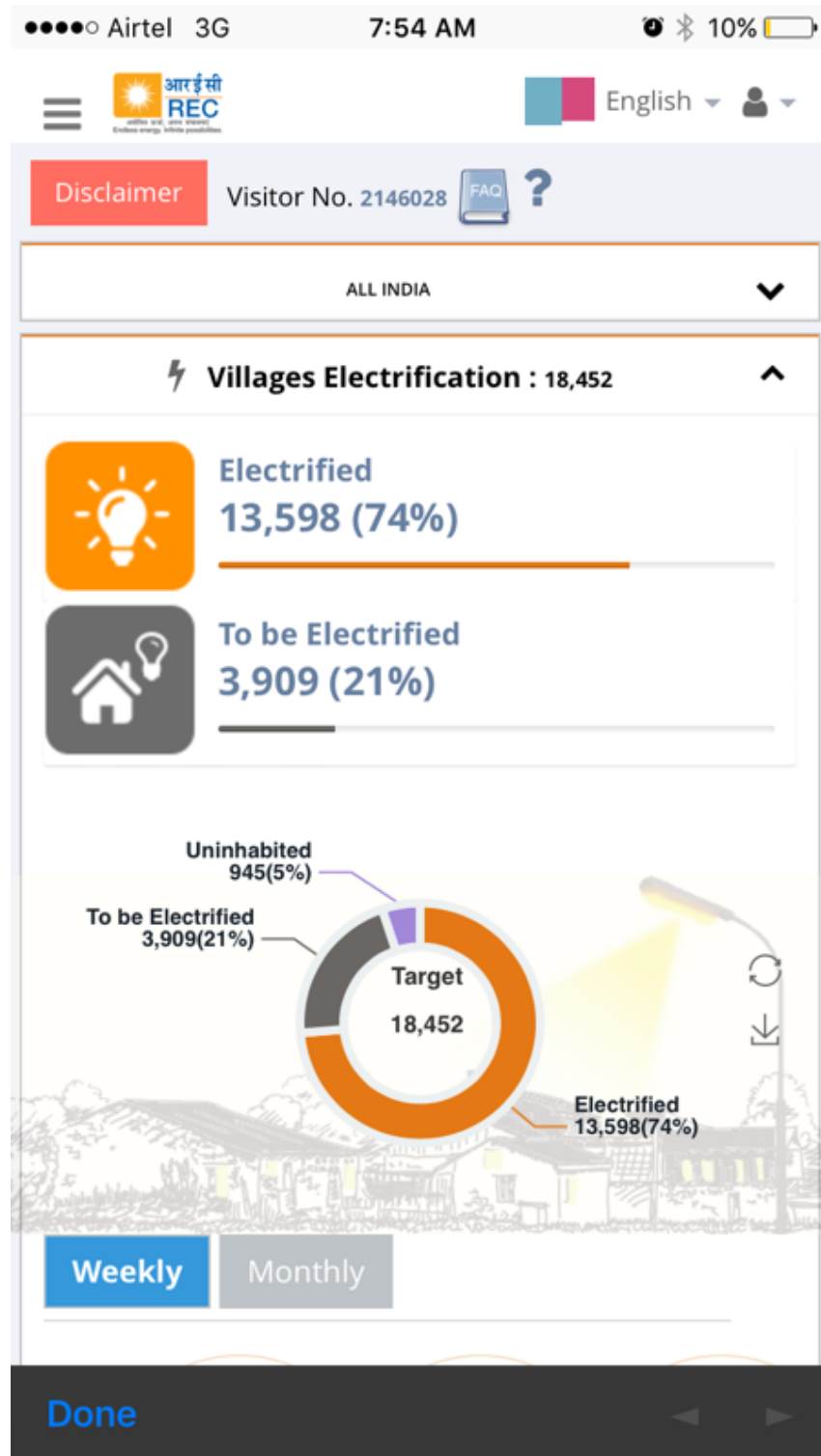


Shortage of trained man-power is a key issue with scaling distributed energy systems

Gap in Value Chain

The Accelerator made a seed stage investment in AnthroPower, a company focused on man-power development

Most of India is “Under-grid”



← Only 8 percent of these villages have 100% of the households electrified

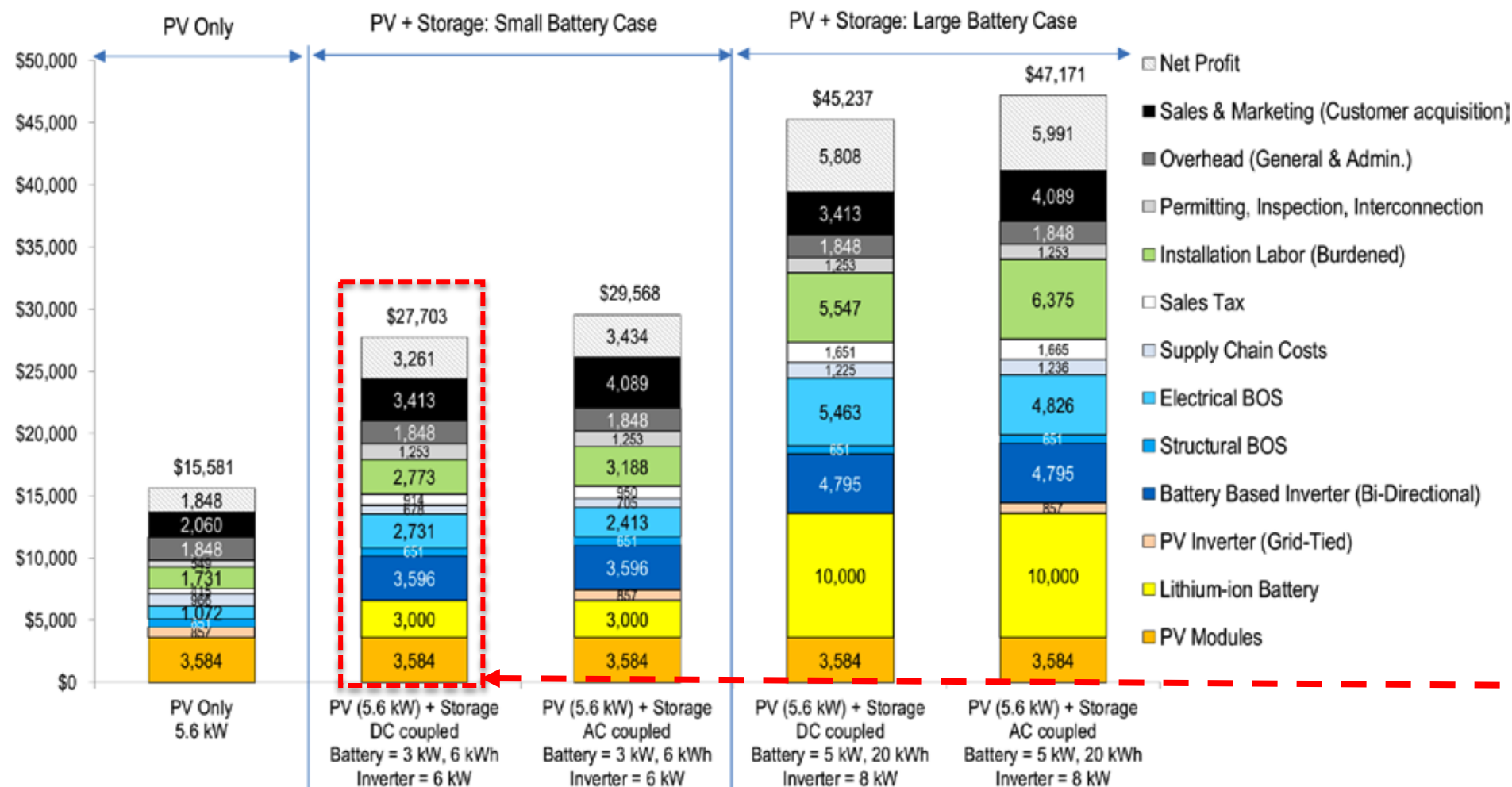
- The biggest barrier is the upfront cost of connection ₹2,000 – 3,000 (about \$400 in Kenya!)
- India currently have a power surplus
- Solar PV bid-prices have plummeted
- Net-metering globally is seen as an unviable solution

Need distribution service cos. for customer service, billing and collection

Need license to operate, own customer

Invest in self-consumption & talented labor force

Pricing of DC- and AC-Coupled PV Systems w & w/o Storage in US market *



NREL makes the case for “Solar PV with storage behind the meter for self-consumption” – need to validate the same for India

Despite the higher cost there is a case for DC-Coupled PV + Storage based solutions for self-consumption, emergency back-up power, peak demand shaving and time of use shifting – without net-metering

The average demand of a US HH is 30 Units per day! Indian requirement would be < 5 Units per day *

There is an opportunity to:

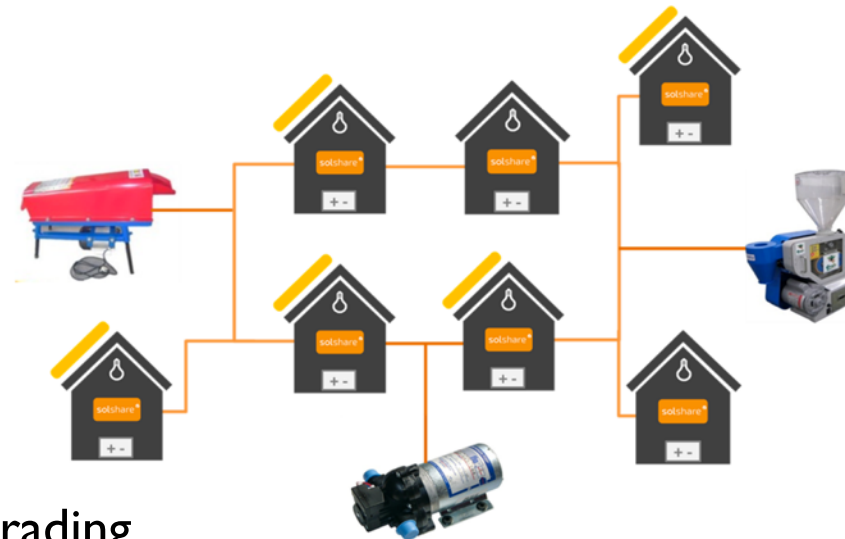
- Go beyond electrical battery storage (Inficold TSS, overhead tank pumps);
- Non-time-sensitive demand shifting and EE behind the meter;
- Invest to drive efficiency in Skilling (AnthroPower) & Customer Acquisition

Provides opportunity to explore new business models

LO3 Energy + Siemens

Brooklyn Microgrid, virtual, peer-to-peer energy trading system built on **blockchain**, using Google Earth to find potential customers

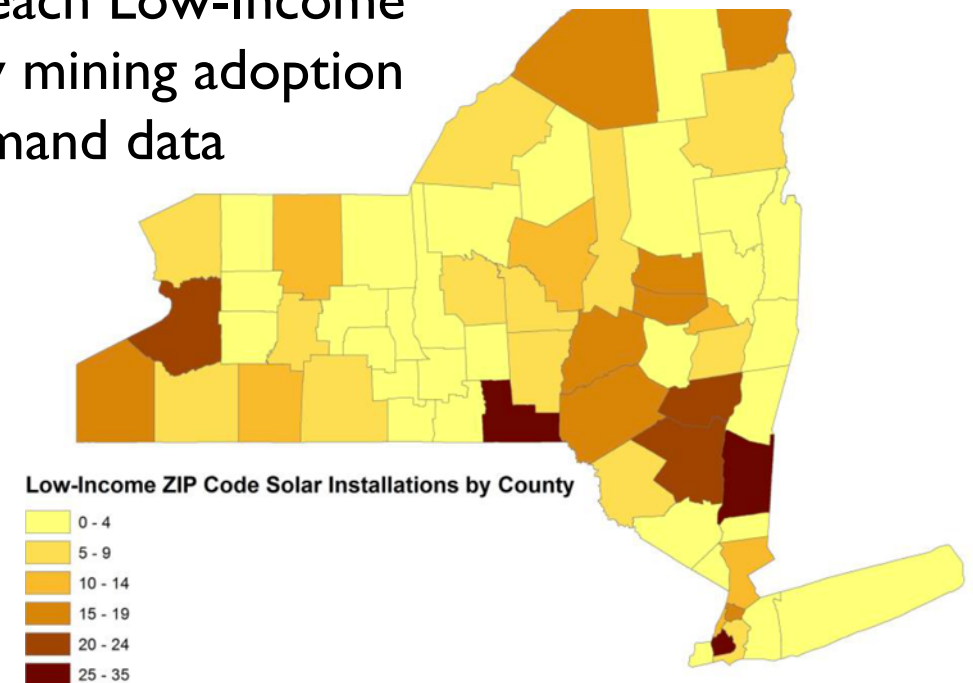
solshare



In Bangladesh, peer-to-peer trading networks of rural households with and without rooftop solar systems.

Producer + consumers can sell excess power into the network, where neighboring homes and businesses can buy it in small increments with a cellphone.

Ensuring New York Solar Programs Reach Low-Income Residents by mining adoption & demand data



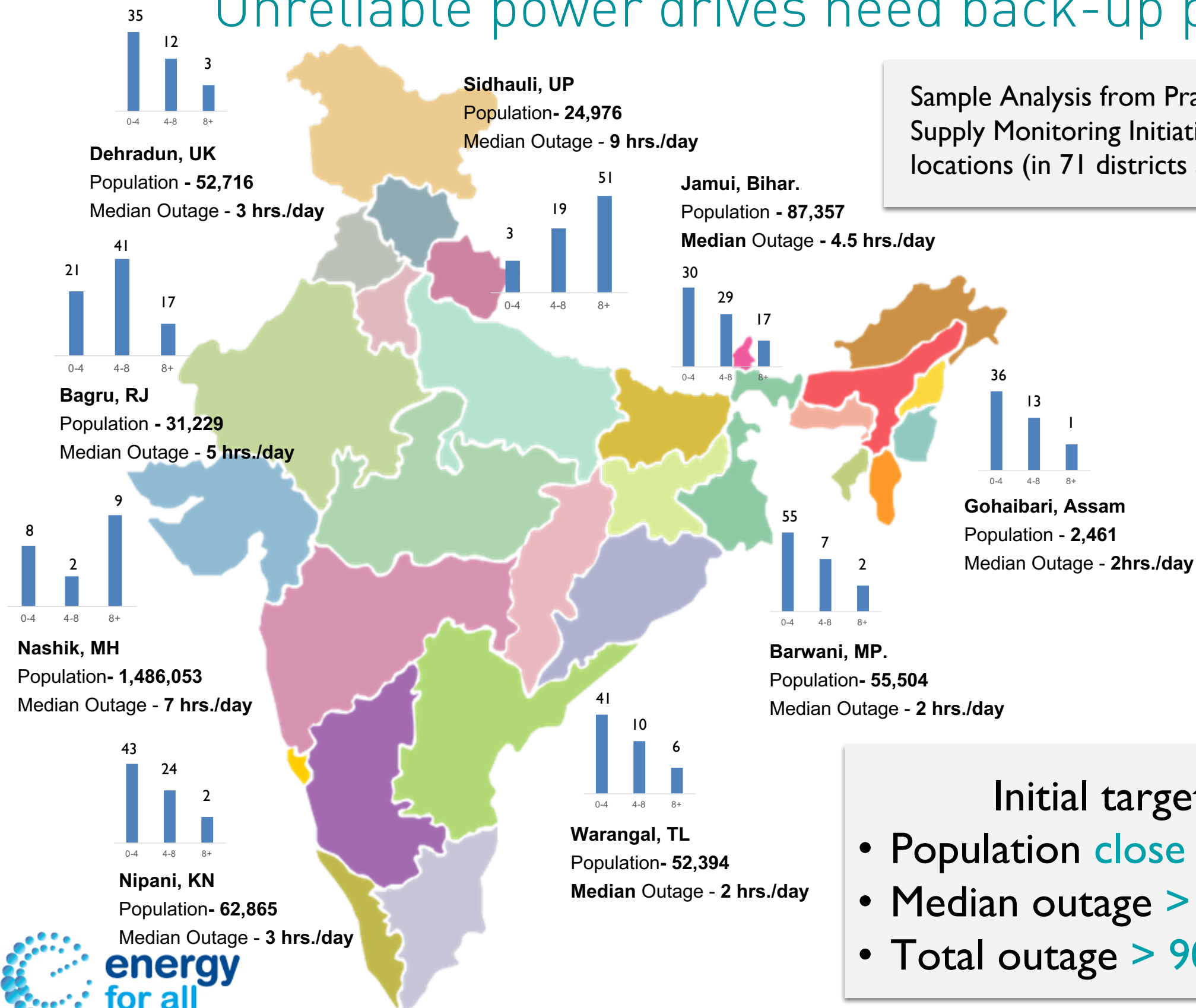
Sonnen



In Germany, a web of about 8,000 customers, both with and without solar on their roofs, who are trading their stored energy among one another.

Unreliable power drives need back-up power

Sample Analysis from Prayas Group, Electricity Supply Monitoring Initiative that covers 329 locations (in 71 districts across 20 States)



Initial target cities

- Population close to or > million;
- Median outage > 3 hrs./day;
- Total outage > 90 hrs./month

We launched our 1st Accelerator

The Emerging India Accelerator Program



In partnership with



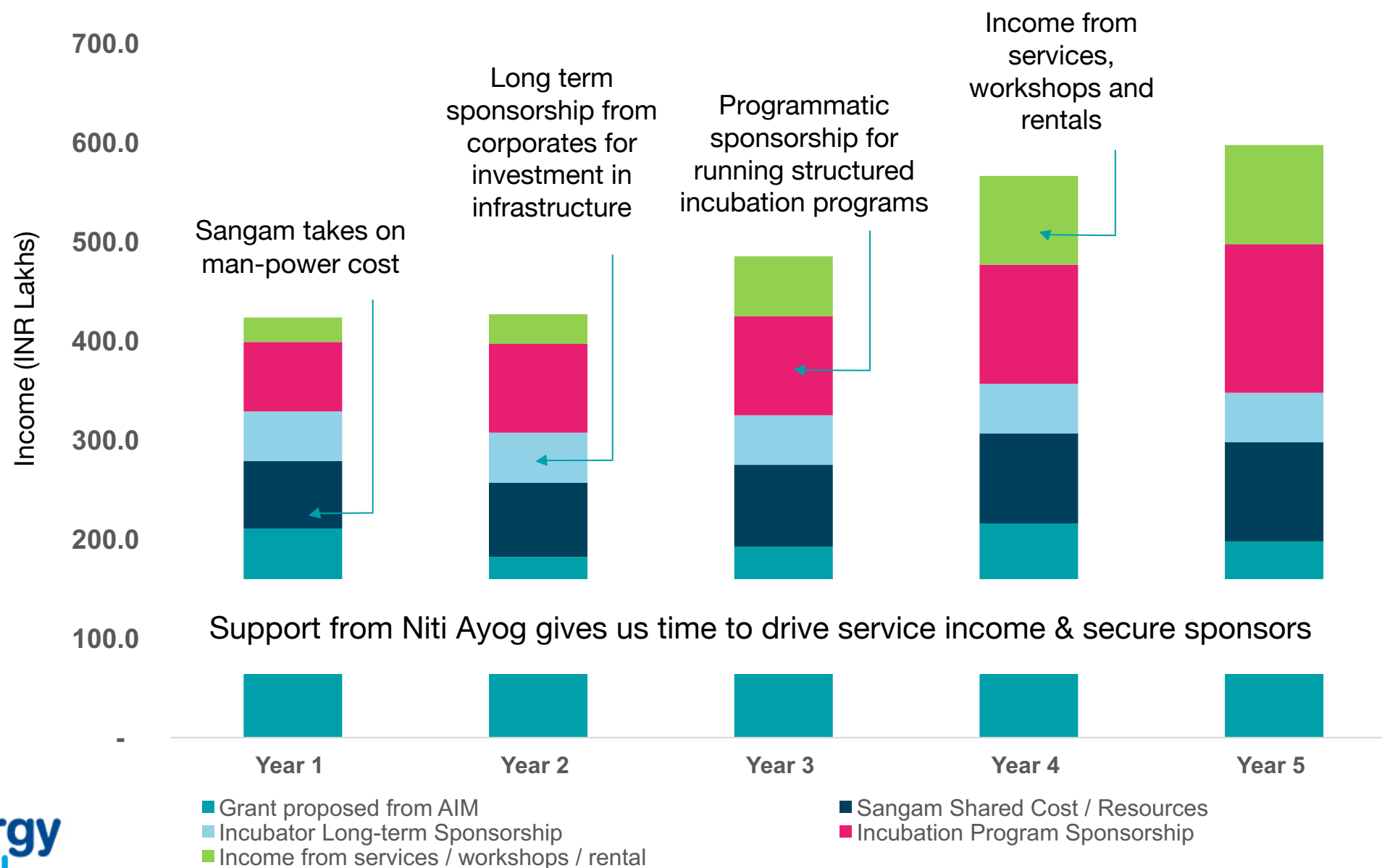
Supported by



- Sangam is part of the inaugural class of 10 VilCap Global Communities running localized VilCap incubators
- We believe that thematic challenge focused programs on a periodic basis can bring aligned partners, mentors and stakeholder participation
- It took us a year to get the right partners and support in place
- Along with outreach through channels and partners, we are pro-actively looking for and reaching out to startups that fit our mandate to apply
- Program is designed to work with entrepreneurs and startups in the field and with their customers rather than in a classroom

Niti Ayog \$1.5 m grant to setup Cleantech Incubator (AIC*) in Delhi

- Have set up a separate Section-8 (Not-for-profit Co.) to house the incubator
- Currently requires us to show a matching commitment of \$1.5m - we want to use it as an opportunity to bring in aligned industry partnerships



Cross-sector innovation

What can we do to catalyse the sector?

