

Decentralized micro-grids through electricity sharing

uLink: Providing access to affordable electricity

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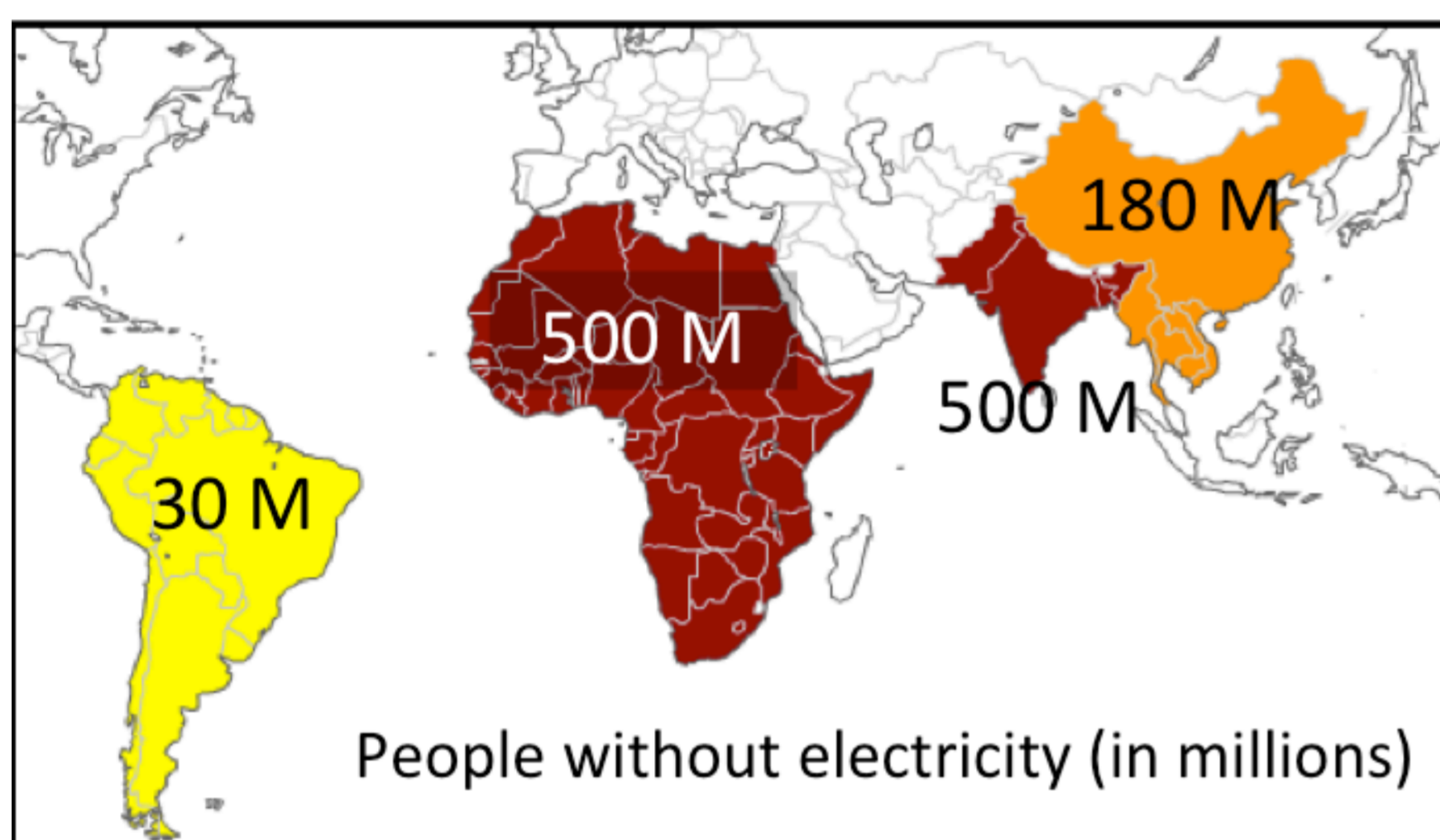


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Abstract/Opportunity

Roughly 400 million people in India do not have access to electricity to-date, most of whom live in off-grid areas.

- Most spend 10%-30% of household income on fuel-based lighting
- Access to low-cost electricity can lead to livelihood improvements



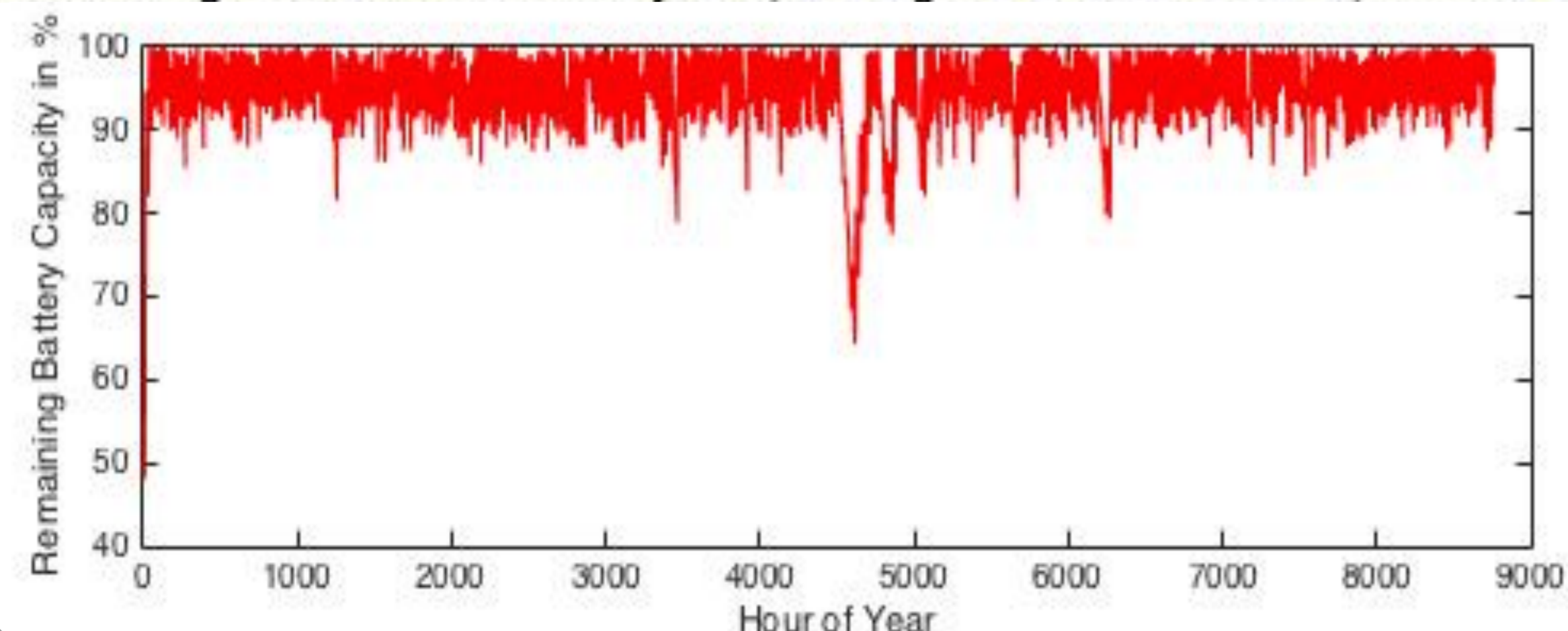
Proposed Solution

uLink aims to overcome challenges with today's conventional solutions for electrification – such as individual solar home systems and centralized micro-grids:

Electrification technologies	Factors necessary for wide scale deployment			
	Low initial capital for user	Ease of deployment	Empower users to add generation	Low cost of capacity expansion
Electric grid	✓	✗	✗	✗
Individual systems (e.g. solar, etc.)	✗	✓	✓	✗
Traditional microgrids	✓	✗	✗	✗
uLink	✓	✓	✓	✓

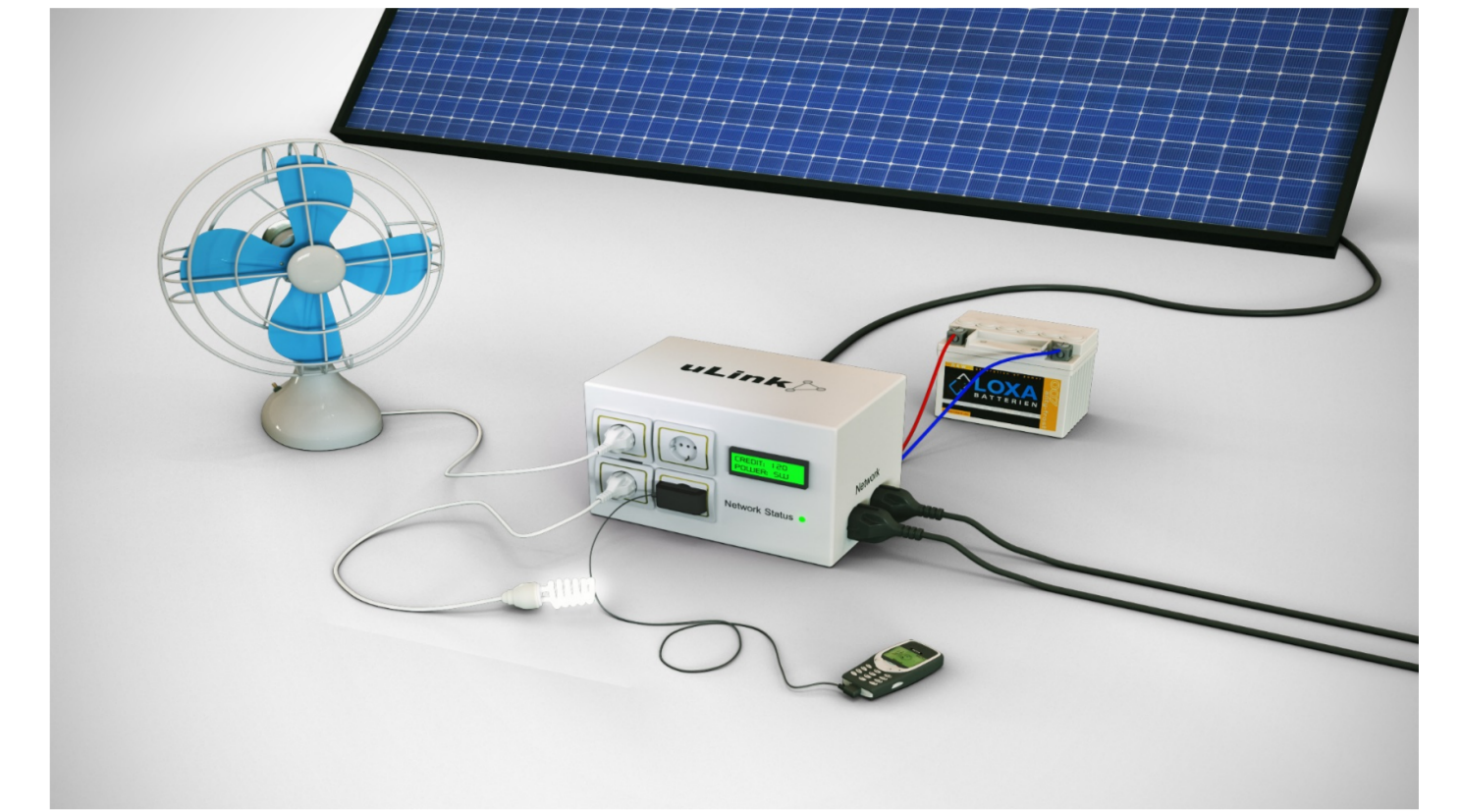
uLink aims to provide a scalable solution for electricity access by connecting decentralized solar panels together and leveraging excess capacity in batteries. Conventional solar home systems are typically oversized for an individual user with basic appliances, as shown below:

Remaining SOC in Solar Home System, serving Total Load: 235 Watt, 180 Ah SHS

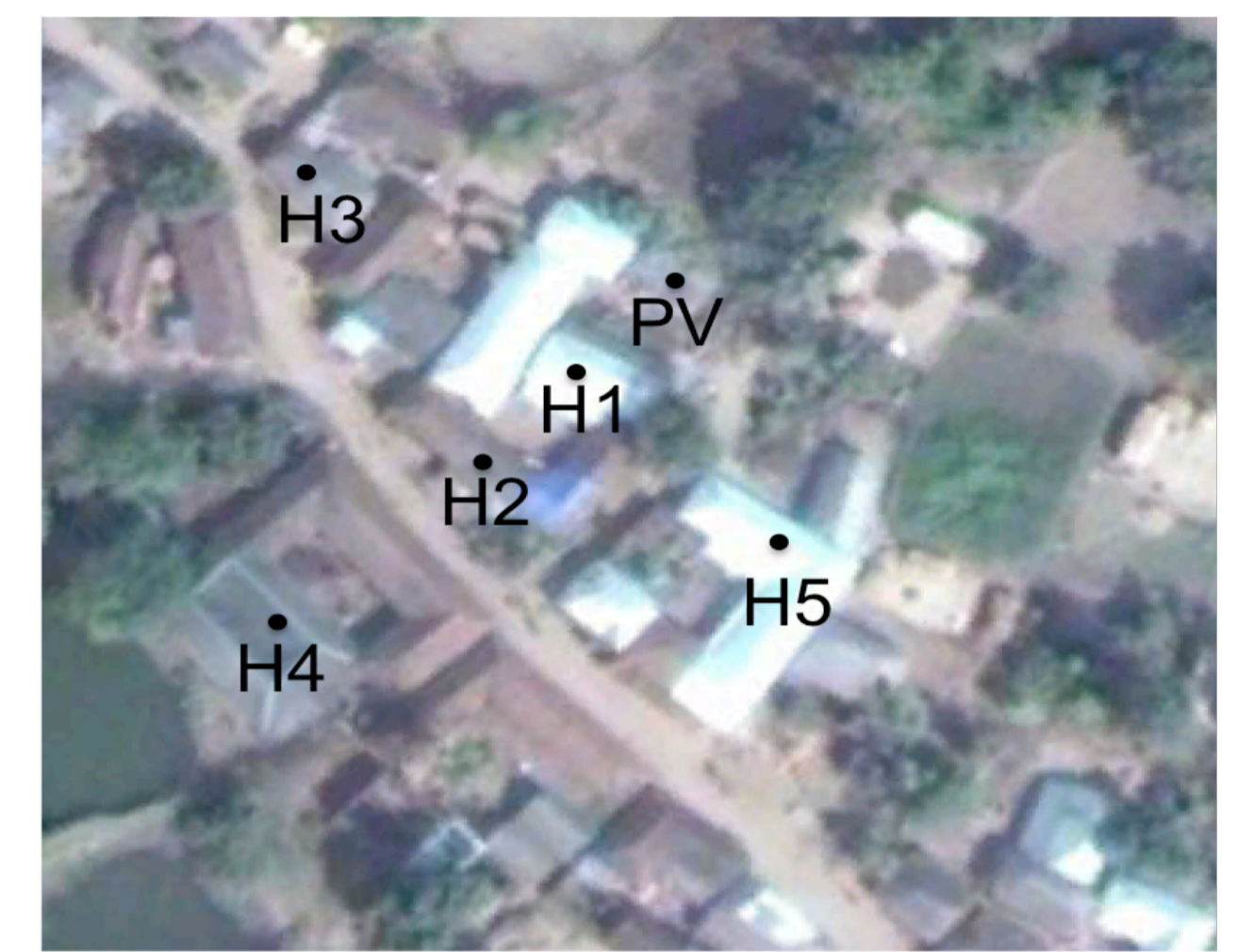


Prototype & Field Trials

In order to enable such a solution, uLink is designed to be a low-cost power conversion and management device designed for rural electrification: Progress to-date includes:

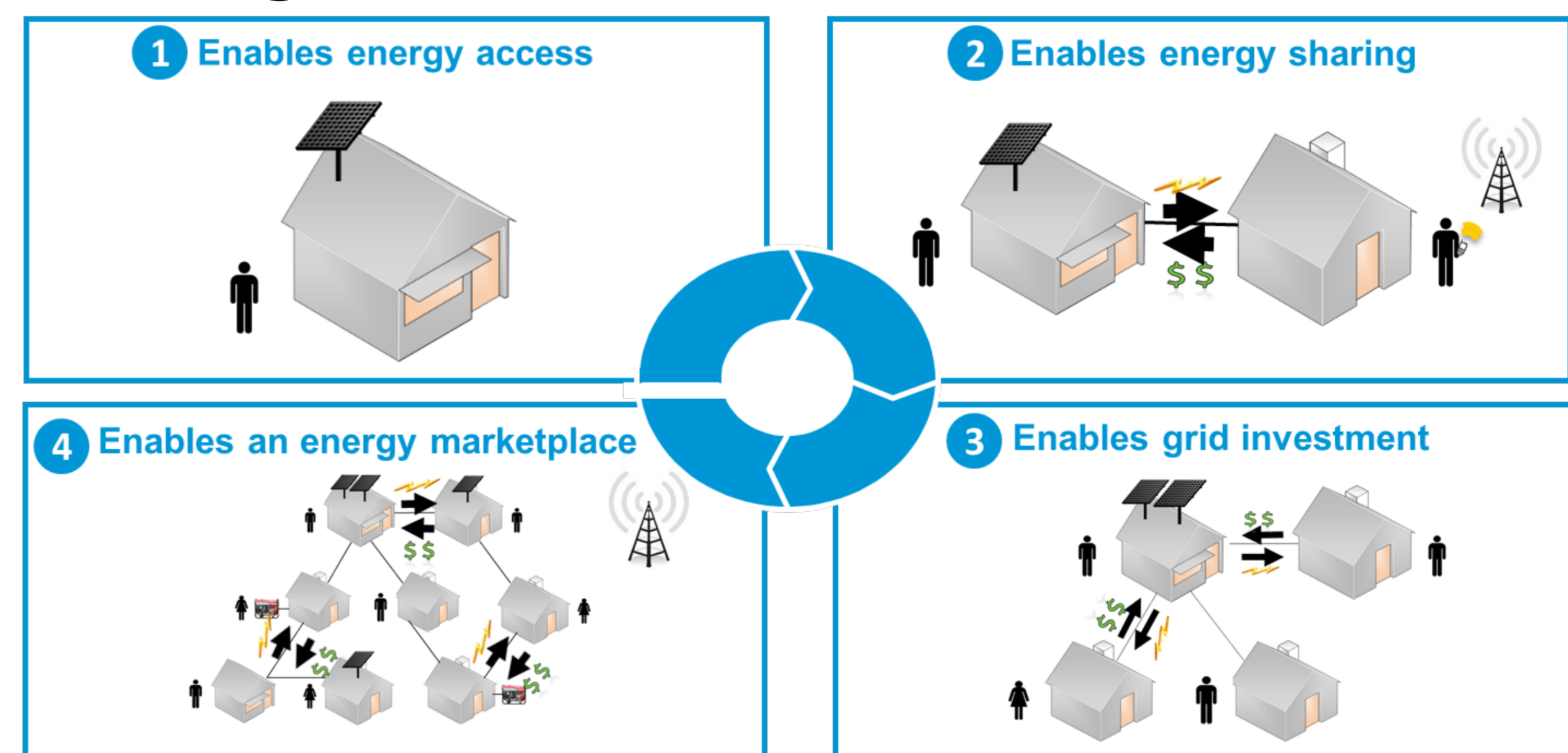


- Demonstration of the technology to village community and larger scale farmers' gathering in Jamshedpur (Jan 2015)
- Demonstration of 5 household interconnection with uLink boxes showing the concept of electricity sharing, and economical advantage over multiple solar home systems (June 2015)
- Industrial design, prototyping and low volume production of hardware in partnership with CLEAR design lab
- Communication interface and control algorithm's robustness improved with collaboration from TCS (Ongoing)



Value Proposition/Next Steps

uLink allows for a network between devices (loads) and solar panels / batteries to be created, incorporating demand management algorithms to control the electricity shared and consumed. The technology helps create a market for excess capacity to be sold to neighbors as an ad-hoc microgrid.



Furthermore, our team has been able to:

- Demonstrate capex and opex advantages of system
- Validate business model assumptions on electricity sharing with on-the-ground feedback
- Begin planning 10-20 household field trial in Aug. 2016



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