solshare®

COMPANY PROFILE

BACKED BY

future energy ventures

edp

IIX Impact Investment Exchange

THE EARTHSHOT PRIZE — FINALIST LONDON 2021

e·on

SBK Tech Ventures

PARTNERS & CUSTOMERS

KFW DEG

RANGS

UNHCR The UN Refugee Agency

aws

GRAMEEN SHAKTI

AWARDS

ZAYED SUSTAINABILITY PRIZE — 2022 WINNER

WORLD ECONOMIC FORUM

FREE ELECTRONS

2020 GLOBAL CLEANTECH 100

The Ashden Awards for sustainable energy

solshare ®

TABLE OF CONTENTS

ABOUT

Initiated in 2014, SOLshare is an ICT-based social enterprise that allows low-income rural households access to sustainable, affordable, and reliable electricity. We have created a revolutionary new approach to bring affordable solar electricity to the energy-poor in remote, rural off-grid communities in Bangladesh, India, and beyond.

SOLshare's corporate strategy is driven by our commitment to build a new energy world fueled by, what we refer to as, the 5**D's: a) decentralization, b) decarbonization, c) digitization, d) democratization, and e) disruption.**

Bangladesh has more than **6 million** individual Solar Home Systems (SHS). 6 years ago, these SHS generated an excess of **30%** energy which summed up to **600,000kWh** of energy being wasted per day. This untapped resource came at a hefty price tag as people suffering under an energy poverty penalty were forced to pay up to **10 USD/ kWh.** This led to extreme user behavior from rural villagers who strived to share electricity amongst themselves.

And thus, SOLshare was born with our first innovation – the SOLgrid. Our award-winning solution, the peer-to-peer solar electricity trading platform, allows low-income rural households to access affordable electricity through existing underutilized solar home system assets interlinked into a platform with metering, distribution, and mobile payment system for the efficient allocation of clean electricity in off-grid areas. Currently benefiting over **15,000 beneficiaries**

Today, we define our market and business through the problem we solve – providing access to sustainable energy services. Our umbrella of services, coined as the **SOLbazaar**, has constantly adapted to new circumstances in today's changing market, which has led our SOLbazaar to grow into three main business lines over the years: **1. The SOLgrid, 2. The SOLclock and 3. The SOLmobility**

Our Financial Inclusion product, the SOLclock is a High-efficiency, low-cost Pay-as-you-Go (PAYG) technology for any AC or DC appliances that have been designed for on-grid and off-grid markets, offering to make consumer electronics accessible.

In micro-mobility, our solutions are providing mobile money (PAYG) tech integrated smart batteries through improved financing mechanisms and leasing models that empower electric three-wheel drivers to earn a higher income. Currently charging 400 vehicles.

We are continuously sharpening but also expanding our service offering, always bearing in mind to solve a fundamental pain point of our target customers which are represented by the base of the pyramid, as well as a growing middle and affluent class. Our solutions combined are currently reducing nearly **100 mtCO2e** while also helping vulnerable communities by improving livelihoods and empowering these communities.
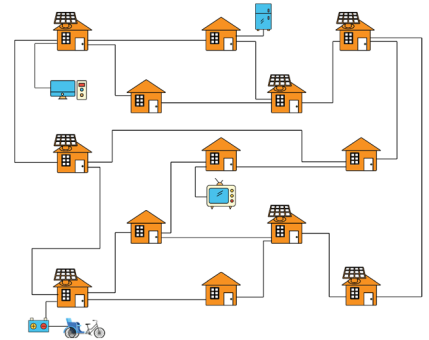
0 5

solbazaar™

The marketplace for future-proof energy infrastructures.

solgrid™

SOLAR MICROGRIDS
SOLGRIDS - SOLAR P2P MICROGRIDS

- Interconnects households and micro businesses
- Uses SOLbox : point of interconnection within the peer-to-peer network
- Allows users to sell excess electricity and earn income directly from the sun

solmobility™

MICRO-MOBILITY
ELECTRIC 3-WHEELER CHARGING

- PAYG lithium-ion battery leasing model
- Smart metered pit-stop charging stations allows rickshaw pullers to fast charge during the day.
- Risk reduction through IoT intelligence on the assets

06

MISSION

Create a network. Share electricity. Brighten the future

VISION

Providing Vulnerable Communities access to awesome energy services.

ENTITIES

BANGLADESH
ME SOLshare Ltd.
LM Tower (2nd Floor), Ka/87,
Joar Shahara Bazar Road Vatara,
Dhaka - 1229, Bangladesh

GERMANY
MicroEnergy International GmbH
C/O ME SOLshare Germany
Potsdamer Straße 143, 10783 Berlin, Germany

INDIA
ME SOLshare India Private Limited
B-102, Brigade Gardenia Apt., 9th Cross, RBI Layout, J. P. Nagar
8th Phase, Bengaluru, Bangalore, Karnataka, India, 560078

INTERNATIONAL
ME SOLshare International Pte. Ltd.
6 Shenton Way #21-08, OUE Downtown 2
Singapore 068809

07 SOLSHARE'S TIMELINE

2014

OPENED 1ST OFFICE & LAB IN DHAKA!

SELECTED FOR THE CTI-PFAN ASIA CLEAN ENERGY FORUM.

2015

COMPLETED SHARIATPUR PILOT GRID SYSTEM, FIRST OF ITS KIND!

OFFICIAL INCORPORATION CERTIFICATE RECEIVED

2016

UNFCCC CLIMATE AWARD AT COP22

2017

8 SOLAR P2P GRIDS INSTALLED BY Q1

SEED FUNDING RAISED THROUGH ANGEL INVESTORS: USD 385K

2018

UNDESA GRANT TO IMPLEMENT 100 GRIDS, RAISED SERIES A FUNDING OF USD 1.64M, WORLD'S BEST ENERGY STARTUP, FREE ELECTRONS

2019

25 SOLAR P2P GRIDS INSTALLED, INSTALLED 2 SOLAR P2P GRIDS IN INDIA

2020

38 SOLAR P2P GRIDS INSTALLED , RAISED BRIDGE ROUND OF USD 1.5M

2021

**ACTIVATED 100TH GRID, LAUNCHED CHARGING FOR ELECTRIC THREE WHEELERS. WITH 6 EV CHARGING STATIONS
SOLAR ROOFTOP PROJECT
THE EARTHSHOT PRIZE FINALIST UNDER THE CATEGORY OF FIX OUR CLIMATE
SOLSHARE AND SHAKTI FOUNDATION RECEIVED £300,000 FINANCIAL SUPPORT FROM FCDO**

We have installed

1500+ SOLboxes

with

100+

operational microgrids impacting more than

15,000 beneficiaries

reducing more than

100,000

kilograms of CO$_2$e

09 DEPARTMENTS

Business and Finance
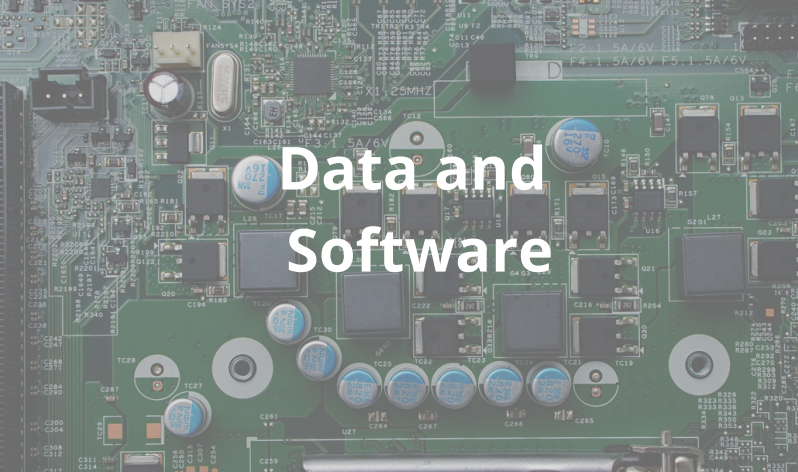
Hardware and Firmware Development

Investor Relations and Fundraising

Operations

Data and Software

Product Management

Project Management

PR and Communication

1 1

PEER-TO-PEER MICROGRID

W H A T   W E   D O

SOLshare is building upon the success of an installation base of **6 million** solar-home systems (SHS) in Bangladesh that generates an excess amount of energy worth US **$1 billion** per year that cannot be stored by individual systems.

We are the pioneer of an ICT-based micro-energy transition model, which interconnects solar home systems into smart peer-to-peer micro-grids, monetizing (excess) solar energy along the value chain with mobile money in real-time, thus empowering rural communities to earn a direct income from the sun.

SOLshare is propelling the systemic change of how people use and move electrons around the globe in the spirit of the new energy world fueled by the **5 D's: Decarbonization, Decentralization, Democratization, Disruption & Digitization**. SOLshare's solutions could potentially change the future face of utilities globally, and leapfrog rural communities today.

The smart interconnection of existing and new SHS results in additional electrification of households that could not afford a system themselves, increased capacity for productive use and livelihood improvements, and becomes a source of a new and direct income from their SHS as a prosumer.

DIGITIZATION
DEMOCRATIZATION
DECENTRALIZATION
DISRUPTION
DECARBONIZATION

12

NEED AND CHALLENGE

The Government of Bangladesh projects that electricity demand will reach **34 GW** by **2030** and at least **52 GW** by **2041.** However, with an actual generation below **12,000 megawatts** and over **10 million** people living in Char areas, the penetration of renewable energy is deeply challenged. The poor transmission infrastructure constrains the system and limits the possibilities of a large amount of excess energy, up to **30%.** An unreliable power supply materializes in constant outages that highlight the day-by-day gap between demand and supply.

Moreover, one of the highest charges for renting light and mobile charging, at **US $3.50/kWh** and **US $10.50/kWh** respectively, have fostered private power installations, which now represent **50%** of total investments. Financing options, however, are scarce, locking isolated communities into an energy poverty trap. Lastly, the lack of accurate data in char and river island areas is a stumbling block on an unstructured process that results in significant delays, expenses, and viable projects being discarded. This leads to an opportunity for micro-grids at the community level to enable local balancing, provide extra revenue schemes, and unlock productive use potential.

Productive use at a community level, however, cannot be stimulated only through the provision of energy; a supportive ecosystem that combines access to financing for appliances with entrepreneurial training and market pull for the newly improved, enhanced products and services needs to be created. Bangladesh is the birthplace of microfinance for the poor; today, Bangladesh's microfinance institutions cover some **32 million** members and give out more than **$7.2 billion** annually.

On one hand, combining access to energy systems with financial inclusion instruments and entrepreneurial training for productive use is a clear market opportunity for SOLshare, as it would open the outreach to more than 10 million people who will remain off-grid. On the other hand, the value of the data collected through the peer-to-peer grids could set an academic benchmark for open source models for electricity pricing in decentralized power markets.

SOLshare is proving how enabling and expanding energy access **(SDG 7)** can transform the energy-poor into a sustainable community **(SDG 11)** towards the sustainable and clean bottom-up energy transformation of a country **(SDG 13)**, whilst enhancing gender equality **(SDG 5)**, local productivity **(SDG 1)** and value-added at the level of isolated communities.
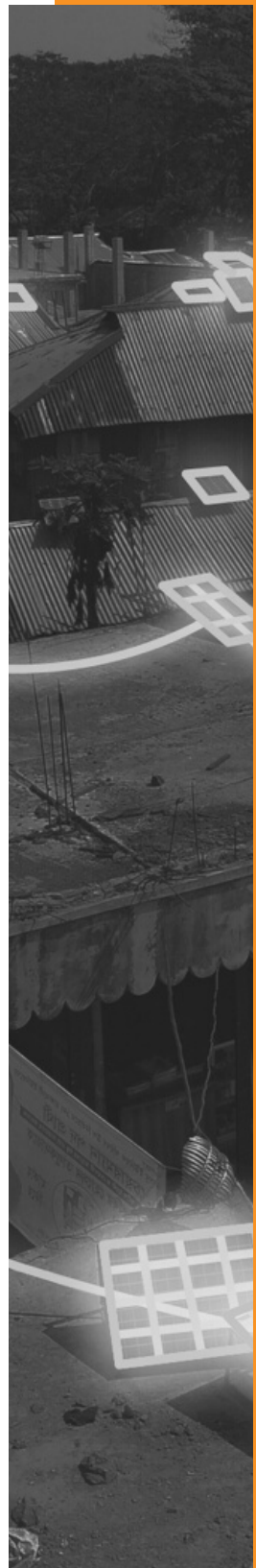
13

P2P MICROGRID TECHNOLOGY

The idea behind the development of the SOLbox was research discovering that **30%** of solar energy is lost every day. This translated into **600,000kWh** of energy that was being lost from **6 million Solar Home Systems (SHS)** daily. SOLshare's technology was developed to tap into this excess energy and create a platform that would allow users to trade this excess energy while simultaneously making a profit. This inclusive approach allowed those without solar home systems access to affordable and clean energy with just a SOLbox.

SOLshare's technology is comprised of our ICT enabled energy trading platform **(the SOLgrid)**, a peer-to-peer (P2P) solar micro-grid, that interconnects households and microbusinesses with and without solar home systems allowing users the freedom to use the energy as a producer, prosumer, or a consumer.

The **SOLbox** is a machine-to-machine (M2M) enabled integrated direct current bi-directional power smart meter that is the point of interconnection within the peer-to-peer (P2P) network. It is the precursor of the 'swarm' approach for sustainable rural electrification. The world's first solar peer-to-peer grid has significant entrepreneurial benefits for all Solar Home System (SHS) users in remote and rural areas in Bangladesh and India where main grid electricity is currently unavailable.

The **SOLgrid** is dependent on an Internet of Things (IoT) working together called the **SOLbazaar**. The SOLbox is installed in every home within the microgrid and empowers users to choose whether to become consumers, producers, or prosumers of energy. The SOLbox shows each user how much energy they can trade, and users can top up the box using pay-as-you-go mobile payment software such as bKash.

Each user is registered using SOLshare's app, the **SOLapp**, which allows SOLshare to study the energy trading data of each user. Every microgrid has a Wi-Fi tower through which data from the surrounding SOLboxes are transmitted to SOLshare's head office. Here, the data team receives, analyzes, and translates this data, which is then stored on a dashboard, the **SOLweb**. This allows the team to stay abreast of any issues that could hamper the performance of the SOLboxes and repair them remotely when issues are minor.

Data collection is a primary objective of SOLshare which is used as a part of operations and maintenance. Each microgrid has a trained appointed **SOLshare Area Manager (SAM)** who looks after the grid and can help tackle minor problems that may occur. The SAM also ensures that a field engineer is on-site if a bigger problem happens. All of the analyzed data is ultimately used by SOLshare's R&D and Lab teams to continue to upgrade and optimize the SOLbox.

14
TOPOLOGY & DYNAMISM OF SWARM ELECTRIFICATION

Connect to your neighbours

Create your own grid

Use more energy and appliances
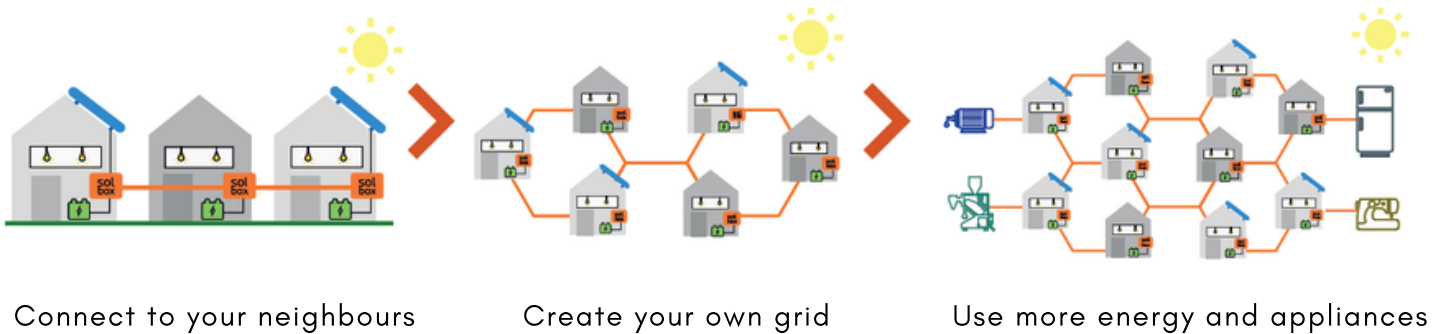
A web-based energy trading marketplace, where people can trade excess electricity.

Other functions include data and grid management, customer support, and integrating data from:

1. SOLbox: Smart plug & play IoT net metering device for P2P trading, and grid creation by connection with other SOLboxes.

2. SOLapp: Android-mobile app for customer/ payment management and grid maintenance

3. SOLweb: Information gathering and analyzing to understand trends and monitoring for irregularities

15 SOLSHARE'S MODEL

Peer-To-Peer Solar Micro Grids

A platform where solar home system users and non-users can exchange electricity

Benefits:

1. Increased access and affordability of a stable electricity supply

2. Increased flexibility and buy more energy when required

3. Generate income by selling electricity
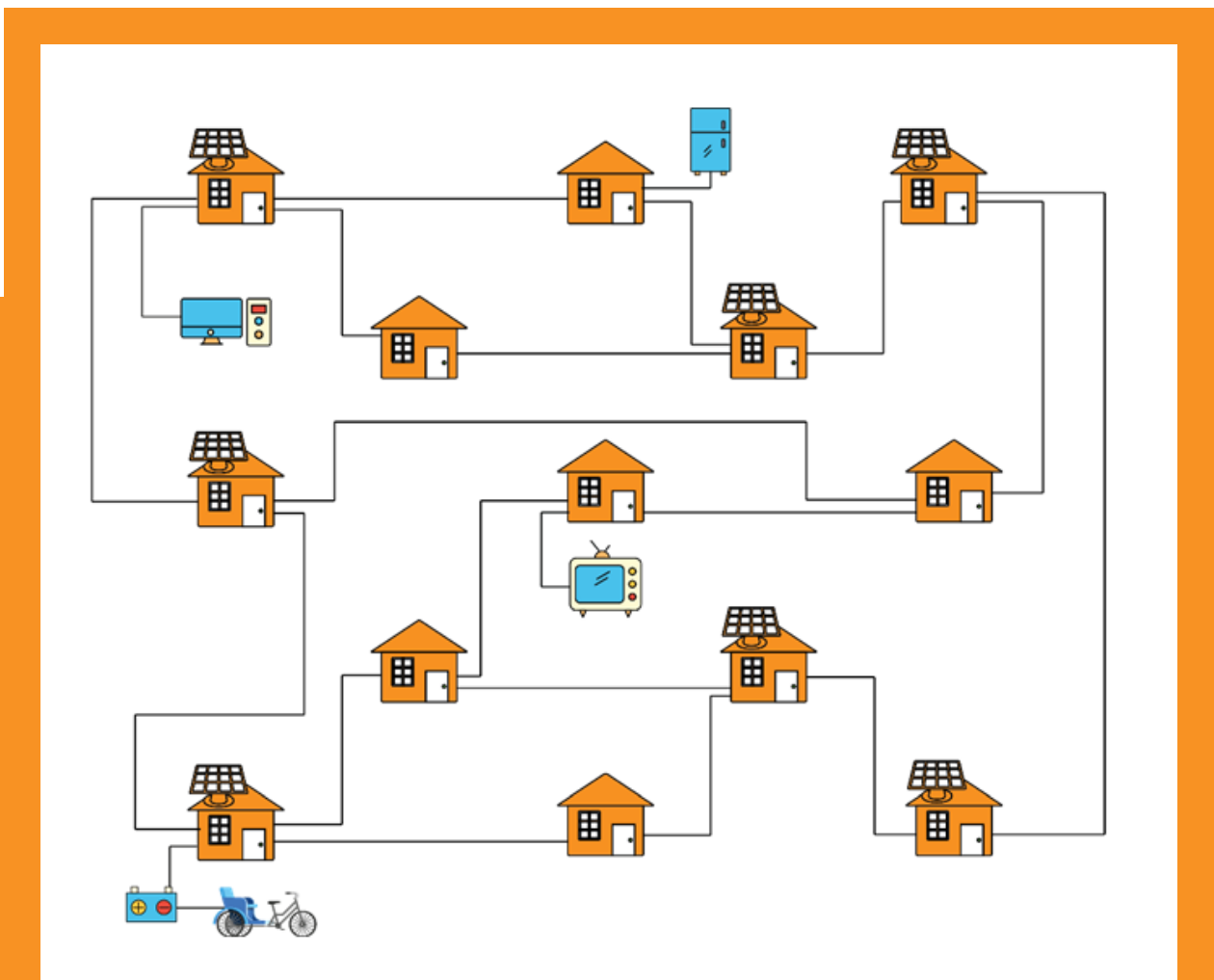
16 SOLSHARE'S MODEL

Access to energy

Basic needs are met immediately
Opportunity for productive energy use

Improved livelihoods
Alternative Income Generating Opportunities
Increased Resilience

Community Empowerment
Building Market Linkages
Revenue Generation

RURAL ECONOMIC DEVELOPMENT

17 ENERGY EFFICIENT SOLUTIONS FOR EV CHARGING

W H A T   W E   D O

Micro-mobility, consisting of, but not limited to two- and three-wheelers, is the fastest growing form of transport in emerging markets due to its small size and relative affordability (UNEP, 2021). However, the electrification of micro-mobility is still nascent in many urban and rural areas of emerging economies, due to affordability barriers, a lack of infrastructure, and unreliable energy systems (KPMG, 2020).

Since the beginning of 2021, SOLshare has been surveying the local three-wheeler EV market. Today, the company has already taken co-ownership of 6 charging stations across the country with ongoing piloting for smart batteries, and we believe that we can increase the e-rickshaw driver's income by **25%,** enough to bridge the deficit gap that drivers currently suffer under when they take up a loan for their vehicle plus battery set.

The electric 3-wheeler (E3W) charging market in Bangladesh is the country's transportation backbone. With **1.75M EVs** plying predominantly the semi-urban and rural areas, the sector is expected to grow to up to **5M EVS by 2025,** a staggering YoY growth of **30%**. In the context of Bangladesh, **E3Ws** hold an answer to solving the power overcapacity conundrum. According to the Bangladesh Power Development Board, only **40%** of the power generation capacity is currently being utilized in Bangladesh. The market is yet to be formalized and to date the present charging infrastructure is hazardous, uncoordinated, and informal. It is also largely only available during the night for non-rickshaw owners, making it slow and inefficient. Furthermore, often the mileage for charge is not known. SOLshare's surveys have shown that there is a fair amount of range anxiety among rickshaw drivers unwilling to take up the more profitable long-term trip (>10km) in the afternoon.

The Need

In the current process, rickshaw pullers are unaware of their mileage for charge, giving them range anxiety. Rental rickshaw drivers pay **89%** more to charge their batteries than garage owners would have to pay to charge from the grid. Not to mention, these commercial battery banks only last between **6-7 months,** whereas conventional lead-acid batteries last between **2-3 years**, while lithium-ion batteries go for **5-6 years.** The charging mechanism is also decentralized, as EV owners partner with households who run mini charging stations using the residential tariff which is significantly higher than the EV charging official tariff.

On part of the charging stations, they too are at a loss with their high electricity costs due to inefficient chargers, lack of commercial meters, and improper wiring. They also lack the capital to invest in commercial charging stations, which can bring down the electricity cost.

18

While the advantages of LI batteries by far outweigh the older lead-acid (LA) battery technology, leading to a per-day cost reduction of more than **70%**, to date there are hardly any LI batteries on the road, nor any systematic approach to charge those vehicles. LI batteries used for e-mobility can be repurposed for rural stationary storage applications, such as our solar p2p grids.

There is a mix of lack of access to supply chains, financing, and enabling for the LI batteries at play that have to date prevented a systematic larger uptake. In neighboring India, in turn, this rapid transformation has already been initiated. In Bangladesh, we are the first mover with our PAYG lithium-ion battery leasing model through a smart partnering approach,

The Scope

The number of EVs is constantly increasing every year, providing more scope for growth. According to our surveys, more than **90%** of garage owners are willing to increase the number of charging sessions, given that the batteries can be charged faster, and can be done so during the day. EV drivers are also willing to spend an additional **30%** for day-time charging if it can provide them with extra mileage amounting to at least **BDT 100**. This creates a market opportunity of approximately **USD 200M.**

What We Do

Our e-mobility solution eliminates tailpipe emissions from the electric three-wheelers we work on, addresses good health by reducing pollution, and contributes to building sustainable cities. Rural communities can safely transport their produce, typically food, increasing their productive efficiency. Improved food systems transportation can nourish populations better and provide fair incomes to producers through access to new markets, allowing them to exit the cycle of poverty and contribute more to economic growth.
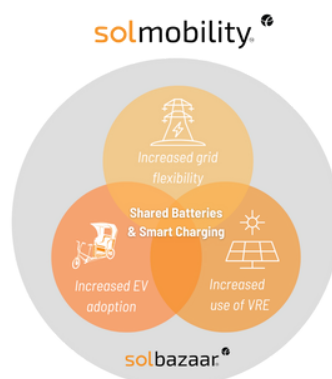
We distinguish three different types of E3W: electric rickshaws (ER), electric mishuks (EM), and easy bikes (EB)

Our innovation helps to increase the profits of rickshaw drivers. This is accomplished by introducing both, new battery technology and improved battery financing into the market.

SOLshare de-risks the provision and financing of these battery assets by providing hardware and software solution that allows remote access and monitoring of these batteries. This allows us to provide financing for lithium-ion batteries and makes them available to the market at a significantly lower cost per day. Moreover, this will give way to evaluate default probability and gives financial institutions a basis to show them a path to risk reduction.

These services here encompass:
- Risk evaluation support.
- Support in the collection.
- Visibility on performance.
- What happens during default.

sol**mobility**

Shared Batteries & Smart Charging
Increased grid flexibility
Increased EV adoption
Increased use of VRE

sol**bazaar**

We de-risk early investment in battery leasing infrastructure through an intelligent platform approach.

19

It is key to align the incentives of the involved actors. Drivers to take up loans supported by SOLshare to gain credit history for better access. For garage owners to decrease default risk, and increase their credit eligibility, in turn, from banks, and for banks to tap into a new market with the comfort of data insights. These batteries, given their longer lifetime and smaller capacity, will reduce their daily battery cost. EV drivers will be able to pay on a per-use basis, rather than be locked into a constant cycle of debt.

SDG Impacts

SDG 1: EV drivers will have an opportunity to earn more through more efficient charging, less frequent battery replacements, and by covering more distances per day for an increased income.

SDG 5: They will be able to charge during the day and could pose an opportunity for more women in the sector as less manual labor is involved

SDG 7: Through this charging system, there will be an increase in access to energy in a reliable manner

SDG 8: It will create better governance by providing better and safer service with a requirement for rickshaws to be registered. There will be an additional push for electric rickshaws to register for access to service. With more and better-charging sessions, more work opportunities will arise in the sector.

SDG 10: The use of smart chargers within the EV charging stations will reduce battery damage and extend battery life for EV drivers thereby reducing their additional heavy investment cost every 6-9 months, providing them an opportunity to pull out of the vicious debt cycle. This will create an increased income through access to energy, which could break the poverty cycle for many.

SDG 13: The planned use of solar PV within the EV charging stations has the capacity to reduce tons of carbon emissions annually, making them a more environmentally conscious choice compared to energy sourced from fossil fuels.

The **SOLmobility** Business Model
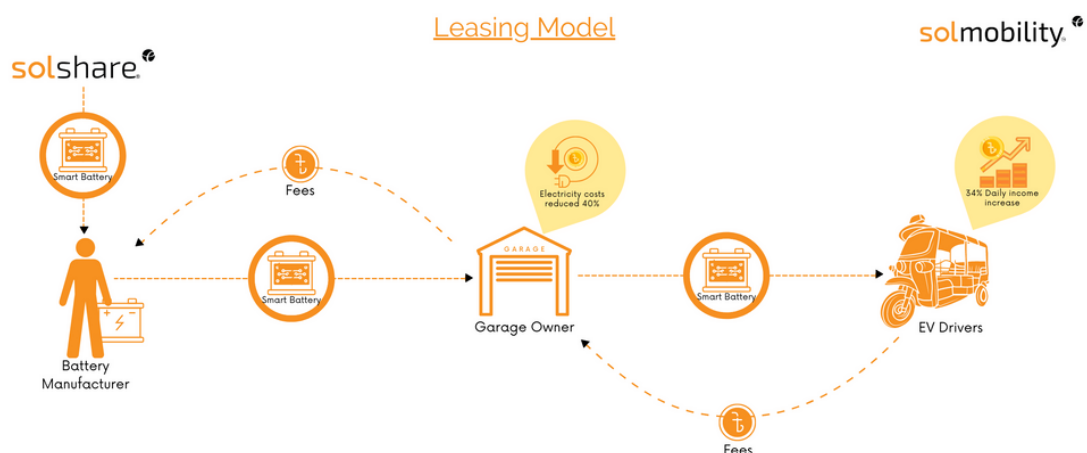
2 0

SOLAR ROOFTOP IN BANGLADESH

W H A T   W E   D O

The Global South is more vulnerable to the effects of climate change and global warming, where Bangladesh is a highly vulnerable place due to rising sea levels. Solar Rooftop installations provide an alternative way to electricity generation that works to fight climate change, and helps to reduce overall energy costs, while increasing the reliability for the electricity supply. As a clean source of energy, Solar PV creates opportunities for sustainable operation and an alternative solution to increasing LNG prices.

The Need

The total sunshine hour in the country lies **10** to **13** hours per day throughout the year, and natural gas still accounts for **73%** of the country's commercial energy. The Electricity price has been increasing every **2-years at 15% (2017)** and **38% (2019)**. The Bangladesh Power Development Board (BPDB) has proposed to raise the bulk tariff of electricity by **23.28%** from **2021** to tackle the massive financial deficit. **40,000 MW** of electricity in Bangladesh could be generated from solar energy by 2041, in which case it would constitute **50%** of the country's installed capacity.

The average annual growth of gas in the past **10 years** has been **5.63%** for industrial use. The Power System Master Plan (PSMP) 2016 also proposed that Bangladesh needs to increase the tariff for gas, coal, and oil products due to expensive imported fuel and investment in energy infrastructure.

The average annual growth of grid electricity in the last **7 years** has been **5.01%** for industrial use, which is correlated with gas prices. The Power System Master Plan (PSMP) 2016 also proposed that Bangladesh needs to increase tariff by **10.3%** until **2041**, to be able to respond to the financial need for the expansion and quality enhancement of power infrastructure.

21

The Scope

At least **8,000 MW** of solar power could be generated by **2041** in case of "as usual business case scenario", and **25,000 MW** in a "medium case scenario". Currently, Bangladesh generates a total of **649.61 MW** of electricity from different renewable sources while the country's total generation capacity is **22,000 MW.** Of this, **415.68 MW** is being generated from solar power. This leaves a big gap for improvement and implementation of solar power, which could potentially help Bangladesh reach the target numbers.

While the price of electricity increases with time, the cost of solar power remains the same over time. Hence, the use of rooftop solar services reduces production and energy costs, increases the reliability of electricity supply, and provides an alternative solution to increasing electricity prices by costing 15–**20%** less than that of utility services.

The installation of Solar Panels also allows more industries to earn LEED points, eventually making them LEED-certified buildings. As of 2021, Bangladesh has a drastically low number of LEED-certified buildings **(100+)** compared to our neighboring country India **(1000+).**

What we do

Being a pioneer in its line of work gives SOLshare the upper hand in market expertise and enables SOLshare to provide the right services.

Our pre-feasibility study consists of:
- Analysis of present energy consumption
- Analysis of roof conditions
- Estimation of solar PV rooftop potential
- Financial model
- Implementation proposal

Impact

With the Net Metering Policy in place, electricity bills will be lower with the use of Rooftop Solar. This will increase profits for factories while reducing carbon emissions, overall improving the economy.

More than **500 factories** have registered to make their manufacturing facilities more eco-friendly in the garment exporting powerhouse and the nation's net metering rules offer an obvious step in the right direction.

22

To date, SOLshare's solar rooftop projects include:

1. **IRIS Group**

In collaboration with Solar IC, SOLshare has embarked on a **145kWp** rooftop solar project for IRIS Garments. IRIS Group is one of the top knit-based textile manufacturing powerhouses in Bangladesh

2. **Knit Concern**

SOLshare has signed a solar rooftop contract with Knit Concern. Knit Concern has been providing very high-quality knit apparels to the international market (e.g. H&M) since 1992. It currently employs 16,000 people on its single 20-acre premise. In the first phase, SOLshare will install **261kWp** of solar PV rooftop, which will be followed by up to **2MW** of rooftop solar installations across Knit Concerns premises.

The **Solar Rooftop** Business Model
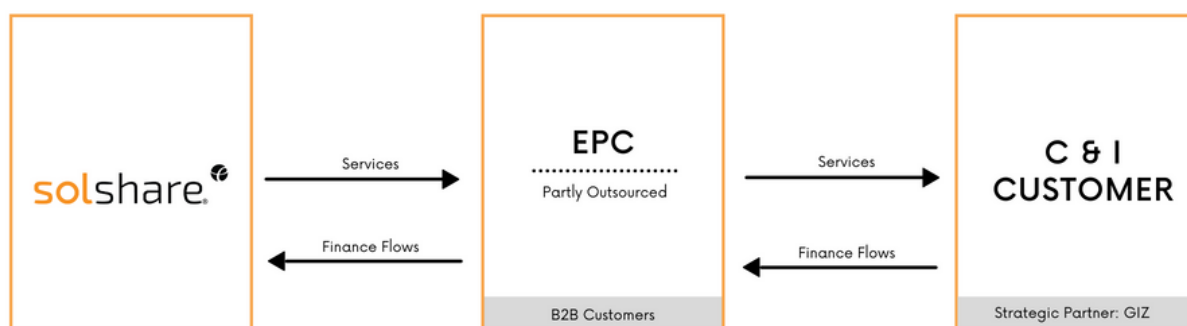
24

SOLTEAM

SOLshare has consistently set and reached ambitious targets in an incredibly difficult and regulated market, such as the setup of local R&D and small-scale manufacturing as well as first pilot implementations. The **Dhaka team** is propelled forward through a direct connection with the rapid pace of the Berlin renewable energy tech scene via our Berlin R&D office. The resulting bi-directional knowledge transfer and development process place us at the cutting edge of product development in the global South context. SOLshare's core team comes with a diverse background in engineering, economics, social science, design, and management with extensive experience in Bangladesh and the developing world.

Levels of Management

CXO	Founders- Strategy Development
PRINCIPAL	Strategy Development
LEAD/HEAD	Leadership, Process Development, Staff Management
SENIOR	Train & Implement
REGULAR	Implement
JUNIOR	Learn & Implement
ASSISTANT	Support

25 LEADERSHIP TEAM

Chief Executive Officer (CEO)
(Founder)
Dr. Sebastian Groh

Dr. Groh is a 2013 Stanford Ignite Fellow from Stanford Graduate School of Business (USA) and holds a Ph.D. from Aalborg University (Denmark) and the Postgraduate School Microenergy Systems at the Technische Universität Berlin, where he wrote his thesis on the role of energy in development processes, energy poverty, and technical innovations. He published a book and multiple journal articles on the topic of decentralized electrification in the Global South.

Since 2014, as the CEO and Co-Founder of SOLshare, Dr. Sebastian Groh's passion has led company vision into reality. He is also an Associate Professor at the BRAC University Business School in Dhaka, Bangladesh. On behalf of SOLshare, he won the empowering people Network Award 2019 from the Siemens Stiftung Foundation. Dr. Groh was further selected into the SE100 2017, a list of the top 100 Social Enablers around the world.

Dr. Sebastian Groh is working as the Chief Executive Officer of SOLshare. He manages the overall operations of the company and his passion has led company's vision into reality.

2 6

Daniel Ciganovic holds a Master's Degree in Economics from the University of Trier with a specialization on Monetary Economics and Social Psychology. He has more than ten years of experience in business development and international development projects and has worked in Germany, Serbia, and Bangladesh.

As Co-Founder and CFO of SOLshare, Daniel is leading the business as well as company development activities, and is overseeing the company financials, accounting, and HR department.

He moved to Dhaka, Bangladesh in January 2015, and has played a major role in the fast development of the company, with a focus on product market fit, operational and business model development. Before joining SOLshare, Daniel worked as an independent consultant for IT Start-Ups in Germany. He then worked in the development sector as a consultant for MicroEnergy International in Germany as well as the KfW Development Bank and GIZ in Serbia, where he was involved in energy and private sector development projects.

**Chief Financial Officer (CFO)
(Founder)
Daniel Ciganovic**

Hannes Kirchhoff grew up in Germany and the U.S. and has lived in South Africa, Tanzania, and Bangladesh. Kirchhoff is an energy and process engineer and holds an MSc. in Renewable Energy Systems engineering, and is pursuing a Ph.D. in DC Microgrids. Before joining SOLshare, Kirchhoff has worked as a technical consultant for MicroEnergy International (Germany) on several projects in Asia and Africa undertaking technology, supplier, and value chain assessments. Previously, he has worked for CAMCO (Tanzania), Schott Solar CSP (Germany), and the Institute for Ecological Economy Research (Germany). Kirchhoff has authored multiple technical and non-technical international publications on the topic of swarm electrification. He was the awardee of the German National Academic Foundation as well as a scholar of the national Ph.D. program of the Federal Ministry of Education Germany. Kirchhoff is involved in standardization work in IEEE and IEC, has co-authored the VDE DKE "Low-voltage direct current standardization roadmap", has served in IEC system evaluation groups, and is a member of the IEC System Committee Low Voltage Direct Current (SyC LVDC).

As the CTO of SOLshare, he is responsible for the provision of prepaid and energy-trading platforms for energy access technologies.

**Chief Technology Officer (CTO)
(Founder)
Hannes Kirchhoff**

27

Aziza holds a Bachelor and Master's in Science in Geology and Mining from Rajshahi University, and later completed a Master's in Business Administration with a major in marketing from BRAC University, Bangladesh.

Prior to joining SOLshare she was part of the management team of BRAC Aarong for over a decade, one of the most successful social enterprises in the world. She earned a gold medalist at Rajshahi University and was announced the BRAC values award winner. Fluent in Bengali and English, Aziza has mastered a range of extra training programs on leadership, gender awareness and analysis, strategic decision making, as well as M&E. Aziza co-developed the smart entrepreneurship approach at SOLshare with an emphasis on its female end-users

As the Head of Operations of SOLshare, Aziza is leading the field operations, sales, aftersales, customer-relations, and production unit and has played a major role in establishing SOLshare in the local energy market in Bangladesh.

Director of Operations
Aziza Sultana (Mukti)

Eshrat Waris is a product development and business strategy specialist based in Bangladesh's technology sector. She is currently the Principal, Product & Business at SOLshare.
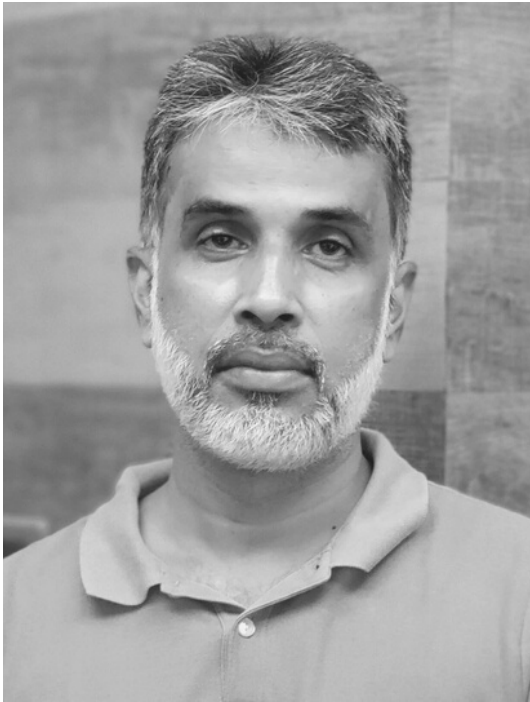
Previously, she led the Technology for Development team of the Skills Development Program at BRAC, where she deployed solutions for customers in the informal economy.

Prior to joining BRAC, Eshrat was at the World Bank headquarter working on social protection, urban and governance issues. She pursued her higher and graduate education at the United World College in Wales, Warwick University and the School of Advanced International Studies of Johns Hopkins University.

Director of Product & Business
Eshrat Waris

2 8

Ishtiaque completed his Master of Business Administration in Finance from the Institute of Business Administration (IBA), the University of Dhaka in 2003 and Bachelor of Engineering in Electrical & Electronics from Chittagong University of Engineering & Technology, Bangladesh in 1994.

So far in his career, he has worked with several renowned organizations like Rahimafrooz, Bangladesh Power Development Board, Linde Bangladesh Ltd., etc. Before joining us, he served Rahimafrooz Renewable Energy Ltd. as the Head, Offgrid.

**Director of Engineering & Innovation
Syed Ishtiaque Ahmed**

Salma S. Islam is a Chevening Scholar with an MSc. in Development Studies from SOAS, University of London, and a BSc in Environmental Studies from NSU.

She spent 15 years working in various development sector organizations such as Oxfam GB in both Dhaka and London, NACOM, ICCCAD, and Adam Smith International (ASI). Her main focus has been on Project Management, Research, and Policy Analysis. She spent her childhood in the United States and has worked and studied in Bangladesh, the Middle East, and the UK. Prior to SOLshare, she was the Senior Research Advisor for the Economic Dialogue on Green Growth (EDGG) a project implemented by ASI in Bangladesh.

She is currently the Head of Projects, Fundraising, and Communications at SOLshare, managing all of SOLshare's ongoing donor and private-sector funded projects. In the past, she managed projects on Green Growth, WASH, the Bangladesh INDC, and Food Security funded by USAID, CDKN, the EU, and DFID. Through this, she brings with her a wealth of development sector experience and a true passion for improving rural livelihoods.

**Head of Projects, Fundraising and
Communications
Salma S. Islam**

29 BOARD OF DIRECTORS

Chief Financial Officer (CFO)
(Founder)
Daniel Ciganovic

Chief Executive Officer (CEO)
(Founder)
Dr. Sebastian Groh

Chief Technology Officer (CTO)
(Founder)
Hannes Kirchhoff

NON-EXECUTIVE BOARD OF DIRECTORS

Yi Jean Chow
Investment Principal at Future Energy
Ventures

Yi Jean is an Investment Principal at Future Energy Ventures, and E.ON.

She was previously Head of Product at Verv, an energy start-up, and started her career in operations and strategic consulting.

She has lived in Boston, New York, Kuala Lumpur, London, and is now based in San Francisco.

She is also host and creator of a podcast, 'Distributing Solar', interviewing entrepreneurs working in off-grid solar in Sub-Saharan Africa, Asia, and Latin America.

3 0

IIX Growth Fund , Managing Director
Robert Kraybill

Robert Kraybill is the Managing Director, Portfolio Management for the Impact Investment Exchange (IIX) based out of Singapore. IIX is a global organization dedicated to building a more inclusive world as the foundation for sustainable peace. They do this by changing financial systems and innovating solutions for women's empowerment, climate action, and community resilience. Over the past decade, they have built the world's largest crowdfunding platform for impact investing (Impact Partners), creating innovative financial products such as the Women's Livelihood Bond, operated award-winning enterprise technical assistance programs such as IIX ACTS, and established an Impact Institute for training and education.

To date, their work has spanned **40 countries**, unlocked nearly **$75 million** of private sector capital to support **130+ enterprises**, avoided over **850,000 metric tons** of carbon, and impacted over **23 million** lives.

IIX has received numerous awards for its work including the Oslo Business for Peace Award, the 'Nobel Prize for Business.' The IIX Growth Fund (IGF) is a **US$25 million** equity fund that invests in enterprises throughout South and Southeast Asia that bring innovative social and environmental solutions to the remotest corners of the world. Rob Kraybill started to mentor SOLshare on financial issues in 2013 when SOLshare came 3rd in the CTI PFAN business plan competition. The engagement which came as part of the prize was originally intended to be one year. However, the relationship between Kraybill and SOLshare never stopped. Today, Kraybill is sitting on our Board representing the IIX Growth Fund.

EDP is an energy producer, distributor, and retailer with **12 million** customers in Portugal, Spain, and Brazil. Its renewable power business is present in **14 countries** including the US and Brazil.

EDP Ventures is the early-stage corporate venture capital fund of the EDP Group, with the aim to support and stimulate the open innovation process in the energy sector.

António Mexia, CEO of the EDP Group, is also the Chair of the Administrative Board of Sustainable Energy for All.

Energias de Portugal (EDP)
Executive Board Member
Manuel Luis

31 SEED INVESTORS AND ADVISORY BOARD

Founder of SBK Tech Ventures & SBK Foundation
Sonia Bashir Kabir

Sonia Bashir Kabir is the Chairman & CEO of SBK Tech Ventures, a Steering Commitee Member at the International Network for Government Science Advice (INGSA), an Advisor at the Federation of Bangladesh Chamber of Commerce and Industries (FBCCI), and a CXO Advisory Board Member at Dell Technologies APJ. After completing her MBA, she worked in the Valley for Fortune 100 companies (Sun Microsystems & Oracle), startups and in the financial district. Her expertise includes strategic planning & growth, sales execution, financial management, team building, and change management. Sonia was the Managing Director for Microsoft Bangladesh, Nepal, Bhutan, and Laos before starting SBK Tech Ventures. She is also the Founder, Chairman, and CEO of SBK Foundation, her non-profit entity that believes in empowering rural communities with technology.

Sonia is the Vice Chairman and Co-Founder of D Money (Fin-Tech start-up), Vice-Chairperson of United Nations Governing Council Technology Bank for Least Developed Countries, Vice President and Co-Founder of Bangladesh Women in Technology (BWIT), and the Founder President of TiE Dhaka (www.tie.org). Sonia has been recognized as a 2017 SDG pioneer by the UN Global Compact and is the recipient of the 2016 Founders Award by Bill Gates. Sonia has been part of the first seed round of SOLshare and also serves SOLshare as a mentor, has kick-started a CSR project between Microsoft, the garment sector, and SOLshare for 2018, as well as a Microsoft fellowship for a new SOLshare data analyst (tbc).

Managing Director at Microenergy International.
Noara Kebir

Noara Kebir's work at MicroEnergy International focuses on innovation, incubation, and the development of strategic topics and partnerships. She is a board member and advisor in many companies in Germany, Bangladesh, Singapore, and Algeria. Kebir is a passionate advocate for the hybridization of scientific research and social business. This is the main reason why she initiated the Scientific Research Group Microenergy Systems at the University of Technology in Berlin in 2005.

Kebir is a senior consultant with 20+ years of experience in energy engineering and economics, inclusive finance and strategic business development, policy assessment and design, project implementation and monitoring. She has the know-how and experience of developing programmatic implementations of pilot and scale up phases, adapted to the need of end-users and the capacities of the implementing partners. She has been a great asset to the company through her regular visits to Dhaka to see and guide its development first-hand.

3 2

Director of Renewable and Appropriate Energy Laboratory (RAEL)University of California, Berkeley
Senior Advisor for Energy Innovation at the United States Agency for International Development (USAID)
Dr. Daniel Kammen

Dr. Kammen is a Class of 1935 Distinguished Professor of Energy at the University of California, Berkeley, with parallel appointments in the Energy and Resources Group, the Goldman School of Public Policy, and the Department of Nuclear Engineering. He was appointed the first Environment and Climate Partnership for the Americas (ECPA) Fellow by Secretary of State Hillary R. Clinton in April 2010.

Dr. Kammen is the founding director of the Renewable and Appropriate Energy Laboratory (RAEL), Co-Director of the Berkeley Institute of the Environment, and Director of the Transportation Sustainability Research Centre. He has served the State of California and the US federal government in expert and advisory capacities. Dr. Kammen was educated in physics at Cornell and Harvard and held postdoctoral positions at the California Institute of Technology and Harvard. He has served as a contributing and coordinating lead author on various reports of the Intergovernmental Panel on Climate Change since 1999. The IPCC shared the 2007 Nobel Peace Prize.

He serves on the Advisory Committee for Energy & Environment for the X-Prize Foundation. During 2010-2011 Dr. Kammen served as the World Bank Group's Chief Technical Specialist for Renewable Energy and Energy Efficiency. He was appointed to this newly-created position in October 2010, in which he provided strategic leadership on policy, technical, and operational fronts. The aim is to enhance the operational impact of the Bank's renewable energy and energy efficiency activities while expanding the institution's role as an enabler of global dialogue on moving energy development to a cleaner and more sustainable pathway. Dr. Kammen has been on Dr. Groh's (CEO of SOLshare) Ph.D. Board, and with this accompanied the company's scientific market analysis since the early days of SOLshare. SOLshare has greatly benefited from his strategic advice and network.

33

Director, Centre for Energy Research of UIU
Shahriar Ahmed Chowdhury

Shahriar Ahmed Chowdhury is a Director at the Centre for Energy Research of UIU, and obtained his B.Sc. in EEE from BUET and MSc. in Renewable Energy from the University of Oldenburg, Germany. He worked for Dhaka Electric Supply Authority (DESA) and Bangladesh Power Development Board (BPDB) for ten years, where he was responsible for distribution system planning and design, load management, Grid system control and protection, Grid substation maintenance, and SCADA systems.

Mr. Chowdhury has designed and initiated a course in Renewable Energy for the first time in Bangladesh for undergraduate students. He performed the technical auditing of the SHSs installed all over Bangladesh in 2008 and 2011. He has established the Centre for Energy Research in UIU in 2010. Shahriar has accompanied SOLshare since its beginning and has been instrumental in its local establishment and continues to be so.

3 5 BENEFITS OF OUR SOLUTION

SOLshare is working to create resilient energy infrastructure that can cope with the extreme changes in climatic conditions in Bangladesh. Through the ICT-enabled P2P solar microgrids households which previously did not have access to electricity have been able to purchase electricity at an affordable rate. Small businesses with SHS have become prosumers and producers where they sell solar power at an affordable rate allowing other small businesses to have power for some time after sundown increasing the economic returns of both parties.

The livelihoods within the rural communities have improved greatly; more children can study after dark and many women have also been able to continue working after dark. The Social Return on Investment (SROI) as calculated by Asia IIX, an external party, estimates that **USD 4.85** of impact is created for every **USD 1** raised for a P2P solar grid operated. Through the installation of P2P solar microgrids, it is estimated that carbon emissions will be reduced by **4M tonnes by 2023** (Asia IIX). The Solar P2P trading of energy has the potential to become a true global south reverse innovation.

We enable the growth of local livelihoods by improving access to sustainable and affordable clean energy. Our automated electricity trading model allows owners of SHS to earn additional incomes by selling electricity from their solar energy systems and make excess energy available to the community.

Solar Rickshaw Charging Station

Solar Cold Storage
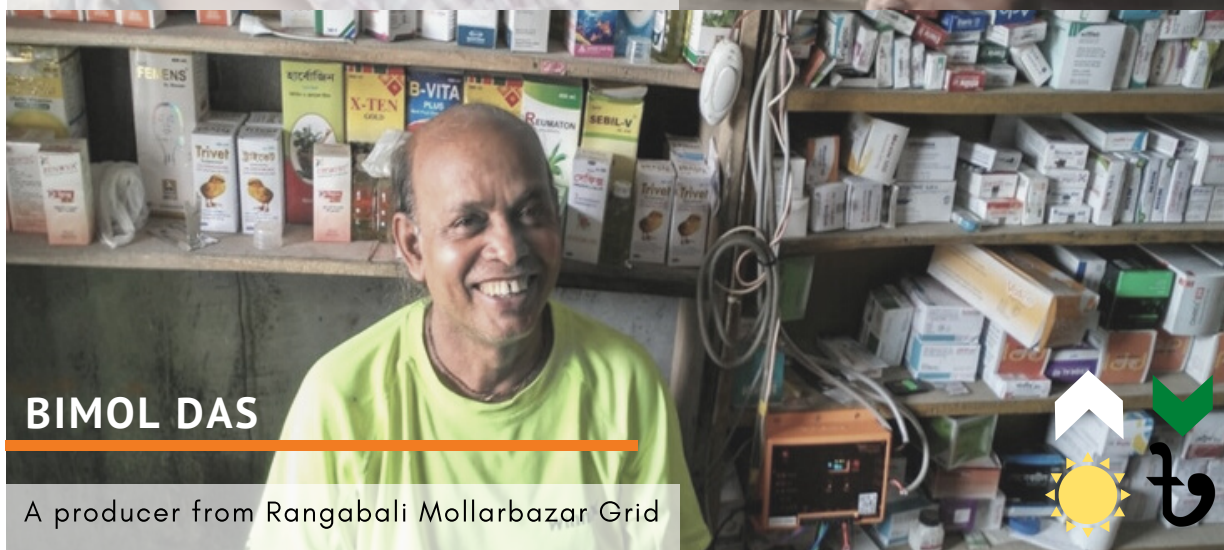
3 6

MAMOIN CHING MARMA

A consumer from Dhormogoda Para Grid

BIMOL DAS

A producer from Rangabali Mollarbazar Grid

MRS. WAHAB

A Prosumer from Hazarbigharchar-1 Grid

37 PROJECTS

Project: Smart Charging for Green Rides.
Status: Ongoing
Location: Bangladesh
Donor: P4G
Award Amount: USD 100,000
Main project features: Development of smart battery technology for lithium ion batteries.

Project: Green, Regulated EV Charging in Rajshahi to improve E-Rickshaw driver's livelihoods lighthouse project.
Status: Ongoing
Location: Bangladesh
Donor: BAT
Award Amount: GBP 46,420
Main project features: Integrating solar PV on an EV charging station in Rajshahi, under the net-metering policy. Deployment of lithium ion batteries for EV drivers.

Project: Technical Feasibility of integrating P2P solar microgrid with the national grid through a single point of connection.
Status: Ongoing
Location: Bangladesh
Donor: FCDO
Award Amount: GBP 300,000
Partner: Shakti Foundation
Main project features: Implementation of a Point of common coupling (PCC) for through which a P2P solar microgrid will be connected to the national grid to feed in excess solar energy..

Project: Piloting 2 peer-to-peer solar microgrids in the Rohingya Refugee Camp on the Cox's Bazar peninsula.
Status: Ongoing
Location: Bangladesh
Client: UNHCR
Budget: USD 80,000
Main project features: Installation of 2 pilot P2P solar microgrids within the Rohingya refugee camp of Cox's Bazar.

Project: Electric Three-Wheelers (E3W) Charging to improve livelihoods for EV Drivers in Bangladesh
Status: Ongoing
Location: Bangladesh
Donor: Siemens Stiftung
Award Amount: EUR 80,000
Main project features: Testing and deployment of Lithium-ion batteries integrated with smart battery technology for the improvement of EV driver livelihoods.

Project: Impact Ready Matching Fund (IRMF)
Status: Ongoing
Location: Bangladesh
Donor: SIE-B/ Roots of Impact
Award Amount: USD 100,000
Main project features: Piloting of lithium ion batteries integrated with smart battery technology.

Project: Improved Electric Three-Wheeler (E3W) Charging to Improve Livelihoods for EV Drivers in Bangladesh
Status: Ongoing
Location: Bangladesh
Donor: P4G
Partner: Integrated Development Foundation (IDF)
Award Amount: USD 100,000
Main project features: Improve battery technology and smart financing mechanisms for an innovative E3W ecosystem and livelihoods of the EV drivers of Bangladesh

Project: Dynamic Pricing Pilot in a peer-to-peer solar microgrid
Status: Completed
Location: Bangladesh
Donor: BRAC-U
Award Amount: USD 11,600
Main project features: Research paper on Dynamic pricing within a P2P solar microgrid

Project: Covid-19 Response in SOLshare's SOLgrids
Status: Completed
Location: Bangladesh
Donor: DEG
Award Amount: EUR 160,000
Main project features: Providing energy subsidies, productive energy use appliances, additional energy storage for microbusinesses, healthcare packages, and new grid connections to SOLgrid communities.

Project: Solar PV Program for Rural Areas
Status: Completed
Location: Bangladesh
Donor: UNDESA
Award Amount: USD 1,000,000
Main project features: Installation of 100 p2p microgrids.

Project: Swarm Electrification in Bangladesh 2.0: Stimulating indigenous growth through rural-based solar rickshaw charging points
Status: Completed
Location: Bangladesh
Donor: GIZ
Award Amount: EUR 281,951
Main project features: Implementation of E.V. charging.

Project: Rebuilding Lives through Energy Access
Status: Completed
Location: Bangladesh
Donor: UNHCR
Award Amount: USD 85,000
Main project features: Pilot of 2 p2p grids

Project: Covid Response
Status: Completed
Location: Bangladesh
Donor: DEG
Award Amount: EUR 200,000
Main project features: Provision of energy subsidies to all users, productive energy use, additional energy storage for microbusinesses, healthcare packages, and new connections.

38 PROJECTS

Project: Access to Affordable, Reliable, Clean Energy
Status: Completed
Location: Bangladesh
Donor: DEG
Award Amount: EUR 100,000
Main project features: Installing 2,200 SOLboxes, and reducing SOLbox price to USD56

Project: Swarm Electrification
Status: Completed
Location: Bangladesh
Donor: BGEF and GIZ Endev Bangladesh
Award Amount: EUR 50,000
Main project features: Installation of three swarm grids in the rural off-grid areas of Mymensingh with productive energy use appliances.

Project: RCTs for SOLdemand estimations
Status: Completed
Location: Bangladesh
Donor: MIT and Harvard
Main project features: To test definite price points of customers and price sensitivities.

Project: SOL-IoT: INTERNET as a SERVICE
Status: Completed
Location: Bangladesh
Donor: Microsoft
Award Amount: USD 100,000
Main project features: Piloting Billable Wi-Fi within two SOLgrids.

Project: Swarm Electrification of Rural India
Status: Completed
Location: India
Donor: GIZ/ Cygni Energy Systems Ltd.
Award Amount: EUR 50,000
Main project features: Installation of two pilot solar P2P microgrids in rural Assam in collaboration with Cygni.

Project: DYNAMIC SOLpricing
Status: Completed
Location: Bangladesh
Donor: ORIGIN Energy
Main project features: To test definite price points of customers and price sensitivities, including dynamic pricing models, to improve grid efficiency and predicting user behavior.

Project: POWER LINE COMMUNICATION
Status: Completed
Location: Bangladesh
Donor: TEPCO
Award Amount: USD 20,000
Main project features: Leveraging existing infrastructure to transfer data.

Project: Providing Support for the Sustainable Energy
Development Access Assessment SE4ALL
Status: Completed
Location: Bangladesh
Donor: TUV Sued / GIZ Bangladesh / World Bank
Award Amount: USD 50,000
Main project features: Assessment of the multi-tier energy access methodology

Project: Regional Technical Assistance (RETA) 7512: Empowering the Poor through Increasing Access to Energy— Swarm Electrification Pilot Project (Bangladesh)
Status: Completed
Location: Bangladesh
Donor: ADB
Award Amount: USD 100,000
Main project features: Piloting a smart solar peer-to-peer microgrid in Bangladesh

Project: Community Based Decentralized DC Microgrids for Combined Household and Productive Use
Status: Completed
Location: Bangladesh
Award Amount: USD 25,000
Donor: Infrastructure Development Company Ltd. (IDCOL)
Main project features: Piloting of electricity sharing enabled technologies

Project: Piloting and Implementation of DC microgrid concepts
Status: Completed
Location: Bangladesh
Award Amount: EUR 50,000
Donor: GIZ & Solar Energy Research Institute of Singapore (SERIS)
Main project features: Innovative ICT infrastructure piloting

Project: Research study on workability of solar minigrids for rural electrification and feasibility study of productive use of solar power in off-grid areas in Bangladesh
Status: Completed
Location: Bangladesh
Client: ADB
Main project features: Feasibility study of productive use of solar power in off-grid areas

39 ACHIEVEMENTS & AWARDS

4 0 ACHIEVEMENTS & AWARDS

Zayed Sustainability Prize
Winner (2022) under the category of Energy

The Earthshot Prize Finalist
under the category of Fix Our Climate (2021)

Ashden Awards
for Financial and Business Model Innovation in Energy Access (2020)

MIT Solve Global Challenges 2020
Good Jobs and Inclusive Entrepreneurship Cohort (2020)

Global Cleantech 100
(2019, 2020)

Global Final at THE BUSINESS BOOSTER
Winner of the grand prize of €100,000 (2020)

Siemens Stiftung empowering people Award
First place (2019)

Unilever Young Entrepreneurship Awards
Dr. Sebastian Groh was chosen as a finalist(2019)

MIT IDE Inclusive Innovation Challenge Asia
Regional winner under technology access (2018)

Tech Pioneer World Economic Forum
(2018)

Free Electrons Accelerator Program- world's best energy start-up, a consortium of 10 giant utilities
Winner (2018)

Microsoft Airband Award
Winner (2018)

IKU Innovationspreis Award
Winner (2018)

UNDESA $1 Million Powering The Future We Want Grant in partnership with Grameen Shakti.
Winner (2017)

2017 Renewable Transformation Challenge by Elsevier Energy & the International Solar Energy Society.
Winner (2017)

Start-Up Energy Transition Challenge by DENA (German Energy Agency)
Winner (2017)

UNFCCC Momentum for Change Award at COP22
Winner (2016)

Intersolar Award "Outstanding Solar Project"
For our pilot peer-to-peer electricity sharing network installed in September 2015, in Shariatpur, Bangladesh (2016)

SUPPORT NETWORK

Thank you to our committed investors and partners for supporting our work!

THANK YOU & join us in co-shaping the future of energy fueled by the 5 D's: Decentralization, Decarbonization, Disruption, Democratization & Digitization

What has a small start-up from Bangladesh to do with the future of energy?

Find out more here:

Zayed Sustainability Prize | Winner 2022

The Earthshot Prize Finalist | Fix Our Climate 2021

2040 – The Regeneration – movie excerpt – Berlinale – Berlin Film Festival 2019

SOLshare | 2020 Ashden Award Winner

GALILEO SPEZIAL: 2057 – WIR SIND 10 MILLIARDEN by Pro7 (German – 2021)

Power Swarm: A revolutionary approach to solar microgrids | earthrise by Al Jazeera 2021

ME SOLSHARE INDIA PRIVATE LIMITED
B-102, BRIGADE GARDENIA APT.,
9TH CROSS, RBI LAYOUT, J. P. NAGAR
8TH PHASE, BENGALURU, BANGALORE,
KARNATAKA, INDIA 560078

ME SOLSHARE LTD.
LM TOWER (2ND FLOOR), KA/87,
JOAR SHAHARA BAZAR ROAD
VATARA,
DHAKA – 1229, BANGLADESH

GERMANY
MICROENERGY INTERNATIONAL
GMBH
C/O ME SOLSHARE GERMANY
POTSDAMER STRASSE 143, 10783
BERLIN, GERMANY

ME SOLSHARE INTERNATIONAL PTE. LTD.
6 SHENTON WAY #21-08,
OUE DOWNTOWN 2
SINGAPORE 068809