# 2022 ANNUAL REPORT





























Building a global network of smart distributed solar powered storage assets





#### **FREQUENTLY USED TERMS**

**E-Mobility:** Transport modes that are battery-powered, eliminating the need for an internal combustion engine (ICE), that releases toxic particulate matter and carbon dioxide.

**SOLmobility:** Converts EV charging garages into grid-friendly net-metered solar garages, providing smart PAYG-tech integrated lithium-ion batteries for improved battery tech and leasing models.

**SOLdongle:** SOLshare's patented technology that enables regular lithium ion batteries to become smart batteries.

SOLroof: Commercial and Industrial solar rooftop installation projects by SOLshare

**Rooftop solar:** Photovoltaic system that has its electricity-generating solar panels which are mounted on the rooftop on various infrastructures.

**OPEX model:** A dedicated energy service company (ESCO) builds, owns and operates a solar rooftop system on C&I premises, and the C&I buys the electricity from the ESCO via a long-term power purchasing agreement. SOLshare delivers services to this ESCO and may opt to be a co-shareholder.

**CAPEX model:** The C&I owns the rooftop solar installation on its premises whereas SOLshare undertakes the engineering, procurement and construction (EPC). The parties might engage in a separate maintenance and operation (M&O) contractual agreement.

**Greener Garments Initiative:** The Greener Garments Initiative (GGI) is an Energy Service Company (ESCO), established by SOLshare and BESTSELLER, a global family-owned fashion company, and a leading provider of solar energy solutions in the ready-made garments sector of Bangladesh

**Virtual Power Plant (VPP):** A network of decentralized, power generating units and flexible power consumers with storage systems.

**SOLgrid:** A peer-to-peer (P2P) solar micro-grid, that physically interconnects households and microbusinesses with and without solar home systems enabling real-time energy exchange.

**Swarm Electrification:** Similar to a swarm of bees, the concept of swarm electrification refers to a swarm of electrons. The more houses that are interconnected, the stronger the swarm becomes, there is more energy, which equals more power.

**Prosumer:** A person/ entity that is empowered to pro-actively produce and consume electricity.

**Point of Common Coupling (PCC):** The PCC is a single access point for pooling and smartly interconnecting distributed energy generation and storage assets to the national grid.

#### **CAUTIONARY STATEMENT**

All statements which refer to future conditions and/or events in this report are forward-looking. Actual future results, including, but not limited to the demand for electricity, changes in production, rates, project plans, costs, capacities, resources available, cash flow generation, the impact of new technology, and its benefits, can differ due to several factors.

These factors include but are not limited to local, national, regional, and global changes in raw material prices, market, and economic conditions; timely completion of our projects; Changes in the demand of our products and services; in the public health, war, security, political, governmental regulation scenarios; Unexpected developments in technology, economy, political sanctions and regulations, and research. Every future statement has been based on management's knowledge and expectations.

AC: Alternating Current ACEF: Asia Clean Energy Forum B2B: Business-To-Business **BAT:** British American Tobacco **BBC:** British Broadcasting Corporation **C&I:** Commercial & Industrial **CAPEX:** Capital Expenditure **CNG:** Compressed Natural Gas **COP22:** 22nd Conference of the Parties **COP26:** 26th Conference of the Parties DC: Direct Current DEG: Deutsche Investitions- und Entwicklungsgesellschaft DPMA: Deutsches Patent- und Markenamt (German Patent and Trade Mark Office) EPC: Engineering, Procurement and Construction **ESCO:** Energy Service Company EV: Electric Vehicle FCDO: Foreign, Commonwealth and Development Office FOREX: Foreign Exchange Market FY: Financial Year GW: Gigawatt **GGI:** Greener Garments Initiative GS: Grameen Shakti IEA: International Energy Agency IoT:Internet of Things **IPS:** Independent Power Supply **KPI:** Key Performance Indicators kW: Kilowatt **kWp:** Kilowatt peak LA: Lead-Acid LEV: Light Electric Vehicle LI: Lithium-Ion LNG: Liquefied Natural Gas MFI: Micro Finance Institutions MW: Megawatt MWp: Megawatt peak M2M: Machine to Machine **OPEX:** Operating Expenditures P2P: Peer-to-Peer PAYG: Pay-As-You-Go PCC: Point of Common Coupling PCT: Patent Cooperation Treaty PPA: Power Purchasing Agreement PV: Photovoltaic PO: Partner Organization QA: Quality Assurance R&D: Research and Development SAFE: Simple Agreement for Future Equity SAM: SOLshare Area Manager SCADA: Supervisory Control and Data Acquisition SF: Shakti Foundation SHS: Solar Home Systems SLA: Service Level Agreement SME: Small and Medium Enterprises SOP: Standard Operating Procedure SPV: Special Purpose Vehicle SREDA: Sustainable and Renewable Energy Development Authority **UAE:** United Arab Emirates **UN:** United Nations **UN DESA:** United Nations Department of Economic and Social Affairs **UNFCCC:** United Nations Framework Convention on Climate Change **USD:** United States Dollar VAS: Value-Added Service **VPP:** Virtual Power Plant YoY: Year-on-Year WEF: World Economic Forum **ZSP:** Zayed Sustainability Prize





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# Message from THF MANAGING DIRECTOR **POOR PEOPLE DON'T NEED CHEAP PRODUCTS BUT HIGH-QUALITY PRODUCTS MADE AFFORDABLE.** solshart

This is a big difference. If you provide them with anything less, you rather do the poor a disservice, you become part of the problem. A problem that keeps poor people poor because they are so. A vicious cycle. An energy poverty trap.

Therefore, SOLshare's mission is to provide vulnerable communities access to awesome energy services. Once they get access to valuable assets and services which last longer, it turns out to be less expensive in the medium run, gaining them a fighting chance to break through this vicious cycle.

Bangladesh has proved this formula once already, when a handful of very smart people in the early 2000s, decided to go against the international recommendation of making the solar home system as cheap as possible so poor people can afford it, but instead insisted on using a more expensive industrial standard battery coupled with financing.

**"AN INNOVATION** THAT IS DISRUPTIVE **ALLOWS A WHOLE NEW POPULATION OF CONSUMERS AT THE BOTTOM OF A MARKET ACCESS TO A PRODUCT OR SERVICE** THAT WAS **HISTORICALLY ONLY ACCESSIBLE TO CONSUMERS WITH A** LOT OF MONEY OR A LOT OF SKILL".

**Clayton Christensen Late Harvard Professor**  SOLshare has made its bet that history repeats itself. Today, there are over 2.5 million electric vehicles in the form of three-wheeler taxis in operation representing the backbone of the country's transportation sector. More EVs than Teslas have sold globally to date! So, who is really driving the EV revolution here? Furthermore, the electric rickshaw comes closer to a "disruptive innovation" than the famous Tesla itself. For example-at least if one uses the term in the original specific and concrete definition by the late Harvard Professor Clayton Christensen: "An innovation that is disruptive allows a whole new population of consumers at the bottom of a market access to a product or service that was historically only accessible to consumers with a lot of money or a lot of skill".

In Europe and the US, all major entrants to the electric vehicle (EV) market started out by developing cars for sale to highend buyers with the hope of eventually moving down market. The commercial success of electric rickshaws in Bangladesh has followed the reverse logic. SOLshare is here to leverage this, and develop the market further to create the change we need, not tomorrow, but today. The Hon'ble Prime Minister said so aptly: The time to save the planet is not tomorrow, but today. I recommend you to take a look at the story of Sohor Ali, a EV garage owner and former driver. He is the backbone of how 75% of all Bangladeshis commute on a daily basis. Today, Ali's business is not considered scalable due to heavy CAPEX for batteries & rising electricity costs. But SOLshare has started to change this. It's millions of people like Ali who are driving a large clean energy transition. We owe it to them to support their livelihoods and passion for change.

SOLshare is developing a global network of smart distributed solar-powered storage assets. In this new system, it is the drivers who are empowered, it is they who become active members of an energy system, which makes it inclusive. It is a decarbonized system where solar generation goes hand in hand with energy storage. It is both highly decentralized but then also accumulated via our point of common coupling (PCC) within the garage, to take the best of both worlds, building the bridge between those decentralized assets to the national grid via digitization on our virtual power plant (VPP). With the highest estimate of up to five million B-Teslas in Bangladesh, through SOLshare's technology platform, they have a VPP potential of 5GW today. This represents more than one-third of Bangladesh's peak load, which was reported as 14GW in 2022.

Find out more about the Rickshaw VPP through a synopsis of our white paper here in this Annual Report 2022, and judge for yourself. See how far we have managed to provide vulnerable communities with awesome energy services while reading through our impact chapters summarizing what we have been up to in 2022.

### THE TIME TO SAVE THE PLANET IS NOT TOMORROW, BUT TODAY

H.E. Sheikh Hasina MP, Hon'ble Prime Minister, People's Republic of Bangladesh, CVF Chair

And last but not least, a big welcome to our latest initiative, the Greener Garments Initiative (GGI), a collaboration, facilitated via Prince William's Earthshot Prize, with the global fashion brand, BESTSELLER, that will propel SOLshare straight to number one in the commercial and industrial (C&I) rooftop solar space and will serve as a base for our future growth. GGI establishes SOLshare as a gateway for international investors into the rooftop solar space in Bangladesh.

The opening up of Bangladesh's rooftop solar market in 2022 is strongly correlated with the volatilities in the global energy market. SOLshare is well positioned due to its brand value and exclusive relationships built over the years to capture this market. We have developed a smart service offering that shifts the capital investment into SPVs or clients' books while transferring technology risk.

Having said that, we have secured contracts for rooftop solar partnerships providing the company with predictable and stable revenue streams for the next couple of years, and investors with significant downside protection for the venture activities in our SOLmobility business line. Therefore, we are right now in the process of closing a simple agreement for future equity (SAFE), and a priced round later in 2023. If you still want to be part of the SAFE round, please contact me as soon as possible.

A huge thank you to the team for a successful 2022. And a big thank you to all of you for your continued support. Now is the time to accelerate our ambitions toward greener horizons.

Enjoy the read.



Dr. Sebastian Groh CEO and Co-Founder, ME SOLshare Ltd





Dr. Sebastian Groh at the Unilever Depot SOLroof installation

Dr. Sebastian Groh at The Earthshot Prize Innovation Summit at NYC.

# **MAJOR 2022 ACCOMPLISHMENTS**



Equipping the first EV

charging station with solar PV

Winning the Zayed Sustainability **Prize in the energy category** 





Inaugurating the PCC

### **Deploying the first smart batteries**

### **Greener Garments Initiative inception**

**Commissioning solar rooftop installations** 

Installing first solar P2P grids in the Rohingya **Refugee Camps** 





# 200,000+

km driven by smart battery powered EVs

# **KEY PERFORMANCE INDICATORS**

MWp projects in the Pipeline

**Collaborations with EV charging stations** (1 solar equipped)

kWp rooftop solar commissioned

Peer to Peer solar microgrids

Number of BOP beneficiaries served with access to productive energy use appliances.

Funds raised to date

Contributing to the lives of

E3W Drivers 2000+

**Households & Microbusinesses** 



incl. extraordinary revenues

2022 Annual Revenue

metric tons of carbondioxide emissions reduced annually



**Beneficiaries are** women and children

## 50.000+**Beneficiaries**

**Jobs created** 



# MISSION

Create a network. Share electricity. Brighten the future

# VISION

Providing vulnerable communities access to awesome energy services





# **POOR PEOPLE DON'T NEED** PRODUCTS HIGH QUALITY PRODUCTS AFFORDABLE



# A GLOBAL CONTEXT

The global energy landscape has seen considerable change over the past few years due to the COVID-19 pandemic followed by the war in the Ukraine. This has resulted in uncertainty across the globe due to the sudden surge in energy demand paired with price spikes and supply constraints, particularly for natural gas and electricity.

On the **bright side**, the shift to low-carbon energy systems and renewable energy has been gaining momentum fast as more large corporations commit to achieving net zero emission targets in the next few decades. Even though most of these pledges have not been transformed into solid policies or actions, it still provides hope for a greener future as more low-carbon and clean technologies continue to grow.

By 2050 the electricity demand is expected to triple, while the generation of renewable energy is expected to make up 80-90% of the global energy mix. However, if we are to stick to the 1.5° pathway in sight, we need to accelerate this progress faster than the established net-zero commitments.

From a policy perspective, both government and consumers are becoming more aware and concerned about their carbon emissions, pushing them to focus on sustainable energy systems more today than ever before, leading them to create more climate and environment-friendly policies. This will allow the global policy environment to move forward in favor of SOLshare as we position ourselves to offer virtual power plant-based services for large-scale bidders. The energy demand is expected to double within the next decade, with most of it rising from developing and emerging economies that will be seeking costeffective renewable solutions. As the demand for renewable energy continues to grow, fossil fuel demand will be declining just as fast in industrialized and emerging countries. This will further open up opportunities for the electric three-wheeler market to dominate the roads further, representing a significant part of the demand.

In the words of Blackrock CEO Larry Fink, "It is my belief that the next 1,000 unicorns – companies that have a market valuation over a billion dollars – won't be a search engine, won't be a media company, they'll be businesses developing green hydrogen, green agriculture, green steel, and green cement." In other words, the era of the rise of climate-tech companies is upon us.

"IT IS MY BELIEF THAT THE NEXT 1,000 UNICORNS — COMPANIES THAT HAVE A MARKET VALUATION OVER A BILLION DOLLARS — WON'T BE A SEARCH ENGINE, WON'T BE A MEDIA COMPANY, THEY'LL BE BUSINESSES DEVELOPING GREEN HYDROGEN, GREEN AGRICULTURE, GREEN STEEL, AND GREEN CEMENT."

Blackrock CEO Larry Fink

HKTDC Research. (n.d.). HKTDC Research. https://research.hktdc.com/en/article/MzU3ODExMzU0
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# **BANGLADESH MARKET OVERVIEW**

Bangladesh is the 8th most populous country in the world with a population over 167 million, a market that is on its way to becoming a \$1 trillion economy by 2040, an impressive 6.8% average annual GDP growth rate over the last decade.

167 MILLION+ 8TH MOST POPULOUS POPULATION **COUNTRY IN THE WORLD** 

> **AVERAGE ANNUAL GDP GROWTH RATE** OVER THE LAST DECADE.

\$1

TRILLION

ECONOMY BY 2040

Termed "one of the world's fastest-growing economies" by Bloomberg, this is a nation that has surpassed its neighboring countries such as India, Vietnam, Indonesia,

Philippines, and Thailand, in average annual growth. The domestic consumer market is set to be the 9th largest in the world, and the rapidly growing middle and affluent class is expected to rise between 2020 and 2025. Mobile phone connection stands at 105%, internet penetration at 70%, and mobile money is omnipresent with over 13 million transactions being performed every day.

ASIAN TIGER: 6.8% AVERAGE ANNUAL GDP GROWTH RATE OVER THE LAST DECADE ' ONE OF FRONTIER 5 ECONOMIES ' \_ JP MORGAN POPULATION OF 167M, ONE OF THE WORLD'S HIGHEST. **APPROX. 2.5M ELECTRIC THREE-WHEELERS** WORLD'S LARGEST SOLAR HOME SYSTEM INSTALLATION WITH 6M INSTALLED

Facts

FASTEST-GROWING ECONOMIES' **ONE OF THE WORLD'S** 

**13 MILLION** DAILY TRANSACTIONS **MOBILE PHONE** SET TO BE CONNECTION **9TH LARGEST** INTERNET **DOMESTIC CONSUMER** PENENTRATION MARKET

Moreover, Bangladesh is also prone to cyclones, droughts, and floods, and the increasing rate of global warming is projected to increase the frequency and intensity of these events. This can cause widespread damage and losses of life while disrupting agricultural production alongside economic activity. Water shortage is yet another negative impact that climate change is causing in Bangladesh. It affects the availability and distribution of freshwater resources, leading to water shortages and increased competition for resources. Lastly, agriculture, a major sector of the economy in Bangladesh that accounts for a significant portion of the country's GDP and employs a large portion of the population is also put under threat due to climate change. This can lead to further food insecurity and increased poverty in the nation.

On the other hand, Bangladesh also happens to be among the top 20 countries that are most vulnerable to climate change. Annually, as a lowlying country, Bangladesh suffers from flooding and salinity problems, destroying homes and infrastructure and displacing a growing number of people from the country's Ganges river delta forcing them to move to the urban areas.

According to State Minister for Power, Energy, and Mineral Resources Nasrul Hamid, the government has been working to implement the long-term master plan for the power sector in phases to generate 40 percent electricity from clean energy and has set a target of generating 10 percent of the total power from renewable energy sources by 2041. Therefore, the development of a sustainable energy sector, which expands clean and climate-friendly electricity access to all regions across the nation, will be of critical importance to achieving the Government of Bangladesh's (GoB) goal of not only moving into the ranks of the global middle-income countries but also to establish itself and move even further.

# **GLOBAL CARBONDIOXIDE** EMISSIONS

Carbon emissions are a major contributor to climate change and are primarily caused by the burning of fossil fuels such as coal, oil, and natural gas. The largest emitters of carbon dioxide, the primary greenhouse gas, are China, the United States, and India. Other major emitters include the European Union, Russia, and Japan. India and China are the two major emitters of carbon dioxide. Other countries in the region, such as Bangladesh, Pakistan, and Sri Lanka, also contribute to carbon emissions, but at a much smaller scale compared to India and China.



It is important to note that the amount of carbon emissions per capita, which is the number of emissions per person, varies greatly between countries. Developed countries tend to have higher per capita emissions than developing countries, as they have more industrialization and higher levels of consumption. It is also worth noting that carbon emissions are not only produced by energy, but also by agriculture, transportation, and land use changes.

#### **Global Carbon Dioxide Emissions**

Global carbon dioxide emissions from fossil fuels and cement have hit a record high of 36.6 billion tonnes driven by an increase in oil emissions as travel continues to recover following the pandemic, according to the Global Carbon Project. Total global CO2 emissions have climbed by approximately 0.8%.

Global carbon dioxide emissions from fossil fuels and cement have increased by 1.0% in 2022, new estimates suggest, hitting a new record high of 36.6bn tonnes of CO2 (GtCO2).

Global CO2 concentrations set a new record of 417.2 parts per million (ppm), up 2.5 ppm from 2021 levels. Atmospheric CO2 concentrations are now 51% above preindustrial levels.

The effects of climate change have reduced the CO2 uptake of the ocean sink by around 4% and the land sink by around 17%. To meet the global climate target of limiting global warming to below 2 degrees Celsius, the emissions cannot only stabilize but have to decline rapidly if we are to reach our net-zero targets in the latter half of the 21st century.







As a climate tech start-up, we believe it is our responsibility to take action and contribute to the fight against climate change. We are acting on this responsibility by harnessing the power of technology to mitigate the effects of global warming by providing clean energy access and services across a wide spectrum of end users, ranging from energy-poor rural communities to commercial and industrial markets.

By making sustainability and innovation our core goals, we have been able to reduce approximately 650 metric tons of carbon dioxide emissions in 2022, helping Bangladesh, and in turn, our planet to take another step towards preserving itself for future generations.

We believe that taking these innovative measures is more than just a responsibility. It is a way for us to pave the path for positive change, inspire future generations and start-ups to follow, and eventually lead the way toward a more sustainable future, starting right here in Bangladesh.

#### Here is what 650 mtCO2 looks like in other metrics



Analysis: Global CO2 emissions from fossil fuels hits record high in 2022. (n.d.). World Economic Forum. https://www.weforum.org/agenda/2022/11/global-co2-emissions-fossil-fuels-hit-record-2022/

## TIMELINE





- Energy Winner at ZSP 2022
- 2 solar P2P grids in Rohingya Refugee Camps
- First solar-equipped EV charging station 🔵
- PCC Inauguration 🗨
- 480+kWp from SOLroof projects

# **COMPETETIVE ADVANTAGE**

SOLshare offers unique solutions for the efficient allocation of clean electricity for rural and semi-urban areas through its ICT platform with metering, distribution, and payment systems, making SOLshare a pioneer in its line of work.

THIS GIVES INVESTORS A CHANCE TO BENEFIT FROM OPPORTUNITIES IN THE NEW ENERGY FUELED BY THE 5 D'S - DECENTRALIZATION. **DECARBONIZATION, DIGITALIZATION, DEMOCRATIZATION, AND DISRUPTION** 

SOLshare has a strong competitive advantage due to its unique capabilities, our first-mover advantage in each of our business lines, robust technology, which all feed on SOLbazaar, the central data hub for future-proof energy infrastructures.

### **WHY BANGLADESH?**

Investing in Bangladesh now is the right choice due to its large population and strong long-term fundamentals. The country has favorable policies around electric vehicles and renewables coming into effect now. SOLshare is well-positioned to capitalize on this, having a head start on doubling down on electric three-wheelers and leveraging an existing infrastructure of 2.5 million EVs and 25,000 charging points. The company is also uniquely positioned to make virtual power plants a reality.

### WHY SOLSHARE?

The recent energy crisis in Bangladesh has demonstrated the increasing importance of renewable energy, with significantly increasing electricity bills paving the way for solar PV. SOLshare's patented technology keeps foreign entrants at bay, while local entrants need to play catch up against SOLshare's multiple years of experience setting up the data infrastructure to function in tough settings. Overall, investing in SOLshare and the energy market in Bangladesh presents a massive scalable opportunity with a comparatively low development cost, and potential future upside through the ability to license its technology and business model to future-proof utilities globally

### **FUTURE POTENTIAL UPSIDE**



Ability to license its technology and business model to future-proof utilities globally.

#### **INTEGRATED BOTTOM LINE**



eek financial performance without compromising on safety, environmental, and social impact.



World's first successful installation, representing a largely untapped market potential.

### ROBUST **TECHNOLOGY MASSIVE SCALABLE COMPARATIVEL OPPORTUNITY** DEVELOPMEN COS A favorable regulatory framework in South Asia

**Full Research and Development out** of Dhaka.

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# **OUR WORK**

The guiding principles of SOLshare's technology strategy are threefold.

**1. ADDRESSING CLIMATE CHANGE MITIGATION AND ADAPTATION 2. ORCHESTRATING INVESTMENT INTO RESOURCES FOR A FUTURE-PROOF INFRASTRUCTURE 3. SOCIAL INCLUSION** 







Our identity is of an 'climate-tech' company that acts as a platform provider for multiple product lines in the domain of electricity infrastructure. As such, we operate and deliver through business-to-business (B2B) and business-to-government (B2G) offerings.

We have been continuously sharpening and 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.

solmobility

Solar PEER-TO-PEER MICROGRIDS

**ELECTRIC 3-WHEELER** 

CHARGING

SOLAR ROOFTOP INSTALLATION SERVICES







# **SOLMOBILITY**

The global electric vehicle (EV) market has been rapidly growing in recent years due to increased consumer demand for a sustainable and ecofriendly mode of transportation. This has been supported by declining battery costs, advances in charging infrastructure as well as government incentives, which have pushed many automakers to shift their focus toward catering to the EV market.

EVs reduce greenhouse gas emissions making them a key driver in the fight against climate change. But, producing these EVs still requires extracting and processing raw materials that have negative environmental impacts. The world's population has reached its all-time high at 8 billion. As EVs are proposed to be the environmentally responsible transport solution, the real question arises - are 8 billion of these large electric vehicles really the sustainable solution we are looking for?



While the concept of an electric vehicle is sustainable, larger cars are not. This is where electric three-wheelers come in. Electric threewheelers are one of the fastest-growing forms of transportation in emerging economies due to their small size and relative affordability. 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. In Bangladesh, the electric 3-wheeler (E3W) charging market plays a crucial role as the country's transportation backbone. The total addressable market for Bangladesh is USD 10 Billion, with approximately 2.5M EVs plying predominantly in the semi-urban and rural areas and more than 25K charging stations across the country.



The sector is expected to grow to up to 5M EVs by 2025, a staggering YoY growth of 30%. This market, however, is yet to be formalized. The present charging infrastructure is hazardous, uncoordinated, and informal and is running on ill-suited lead-acid batteries. It is also largely only available at night for non-EV owners, making it slow and inefficient. Furthermore, the mileage for the charge is not known. SOLshare's surveys have shown that there is a fair amount of range anxiety among EV drivers unwilling to take up the more profitable long-term trip (>10km) in the afternoon.





SOLSHARE'S SOLMOBILITY SOLUTIONS CONVERT EV CHARGING GARAGES INTO GRID-FRIENDLY NET-METERED SOLAR GARAGES, PROVIDING SMART PAYG-TECH INTEGRATED LITHIUM-ION BATTERIES FOR IMPROVED BATTERY TECH AND LEASING MODELS.

At the core of our technological intervention is the facilitation of smart services including PAYG capability for modern batteries. These batteries are equipped with a battery management system that a) ensures the safety and b) allows for data acquisition and battery locking and unlocking. Additionally, these batteries are equipped with SOLshare's proprietary IoT device that allows for Bluetooth communication with nearby devices. These smart batteries are sold to garage owners who in turn, lease them to EV drivers on a PAYG basis with an automatic shut-off function for when the lease time is over. The garage owners have an app where they can see how much they have earned and how much they can cash out. SOLshare deducts its software-as-a-service (SaaS) fees during the cashout.

From a user perspective, modern batteries such as LI batteries, given their longer lifetime reduces the daily battery costs for EV drivers, who now benefit from higher payment flexibility and a smoother payment process, rather than being locked into a constant cycle of debt.

In neighboring India, this rapid transformation has already been initiated. In Bangladesh, we are the first mover with our PAYG battery leasing model through a smart partnering approach.



An EV garage hosting smart battery driven vehicles

# **SOLROOF**

Commercial and Industrial (C&I) solar rooftop installations have seen quite a growth in recent years with more businesses and organizations adopting renewable energy sources in a race to reduce their energy costs as well as their carbon footprint. The global rooftop solar photovoltaic market size was valued at a whopping USD 99.5 billion in 2021 and is expected to grow to USD 398.3 billion within the next decade. In terms of location and geography, the largest share of this market for C&I rooftop solar installations lies in the Asia Pacific region.

The reason that industries are flocking toward this form of renewable energy has a lot more to do than simply reducing climate change. While the generation of clean energy is the most important aspect of this solution, it also reduces the heavy electricity bills that industries are known to generate, slashing those prices by at least 15% to 20%.



With time, the cost of electricity has constantly been rising, and today it is paired with further uncertainties arising with the war in Ukraine and the future of fuel. The electricity price has been increasing every 2 years at 15% (2017) and 38% (2019). The Bangladesh Energy Regulatory Commission (BERC) increased the average bulk electricity price by 19.92 percent with effect from December 2022. The cost of solar, however, remains constant.

Plans laid out by the Mujib Climate Prosperity Plan have Bangladesh at 100% renewables by 2050 creating resilience and energy independence while enabling the country to become a net exporter of energy as a green economy with leading technological innovations.





### WITH THE TREMENDOUS POTENTIAL THAT LIES IN THIS MARKET, SOLSHARE HAS DIVERSIFIED ITS PRODUCT AND SERVICE LINES FURTHER BY BRANCHING OUT TO PROVIDE C& SOLAR ROOFTOP INSTALLATION SERVICES.

This comes with SOLshare's 20+ years of experience with solar photovoltaics and renewable energy technology, paired with German Engineering.

Our services allow clients to build and lease solar PV plants on C&I rooftops to reduce their environmental footprint, and bring down their utility bills while providing an alternative to load shedding and the use of diesel & gas generators. We manage the project finance and set up the solar rooftop installation. For the next 25 years, industries enjoy lower tax rates and 15-20% cheaper electricity rates while being a part of the global clean future. In 2022, SOLshare has commissioned 468.6kWp of grid-tied solar rooftop capacity for its C&I customers, with a 27MWp pipeline based on signed agreements already.

BECOME LEED CERTIFIED AND ATTRACT MORE INTERNATIONAL BUYERS, AS SUSTAINABILITY BECOMES MORE IMPORTANT IN THE GLOBAL CONTEXT.





SOLroof installation at Unilever Depot

## CREATING GREEN, EFFICIENT, AND SUSTAINABLE INDUSTRIES

# **GREENER GARMENTS INITIATIVE (GGI)**





### THE GREENER GARMENTS INITIATIVE (GGI) IS AN ENERGY SERVICE COMPANY (ESCO), ESTABLISHED BY SOLSHARE AND BESTSELLER, A GLOBAL FAMILY-OWNED FASHION COMPANY.

This is the first time ever in Bangladesh that a global fashion brand has become part of an ESCO company to develop and set up solar rooftop installations across the country for a greener supply chain. GGI currently has a pipeline of 12MWp of solar rooftop projects across the country. The partnership has clearly defined roles, with SOLshare being the local operator and technical partner and BESTSELLER, through its parent company Heartland, being the main equity investor.



#### **The Financing Problem**

The reduction of carbon dioxide emissions is a pressing global issue. However, investing in solar rooftop installations can pose a financing problem as it requires a long-term commitment before the benefits can be fully enjoyed.

GGI offers an innovative financing model that provides a solution to this problem. By investing in solar rooftop across Bestseller's factories in Bangladesh, GGI is leading by example and demonstrating a long-term commitment through concrete actions.

#### An Innovative Financial Model

The innovative financing model offered by GGI provides partners with a **20-year** power purchase agreement at a floating discount rate over the utility tariff.

This enables partners to receive subsidized electricity rates while also helping them to reach scope 3 carbon emission reduction targets. Additionally, partners have the option of a solar rooftop buyback, which allows them to monetize their investment if necessary. Overall, GGI's innovative financing model provides a solution to the core financing problem of solar rooftop installations while also contributing to the global goal of reducing carbon dioxide emissions.

Through this partnership, we managed to secure longterm EPC and O&M service contracts which will provide a significant income stream over the upcoming years. We also think that through this partnership, SOLshare will be able to acquire more similar projects, establishing our company as a gateway for international investors into the rooftop solar space in Bangladesh.





# **SOLGRID**

The very base of SOLshare was built upon our SOLgrid technology, the world's first peer-to-peer microgrid that allowed energy-poor rural communities to exchange energy, earning them an income directly from the sun. The SOLgrid was built leveraging the existingsolar home systems in Bangladesh which has the largest deployment of solar home systems in the world.



Bangladesh being the global market leader in SHS, these systems serve six million households and microbusinesses and over 25 million people. However, energy poverty continues to plague the nation leaving up to millions of people without access to reliable electricity due to inadequate distribution networks and burgeoning power disruptions. To address this gap, SOLshare created the world's first peer-to-peer energy exchange network of rural households and small businesses with solar home systems, which enabled a more efficient distribution of electricity across rural communities.

This innovative model is commonly referred to as the prosumer' model, allowing households to become both a producer and a consumer of electricity generated by their SHS installation. In summary, one household can sell excess power into the microgrid network, whereas neighboring households or businesses can buy it in small increments using mobile credits.

Off-grid solar products, particularly the SHS, serves an important role in frontier markets by empowering the 'next billion', who currently lack electricity or live with unreliable or insufficient electricity service. SHS complements grid-based power distribution in frontier economies, by serving as a platform for a) effective energy transition (from fossil fuels to renewables), b) affordable, reliable, and scalable rural electricity supply, and c) carbon neutrality.

And hence the SOLgrid was born.







SOLgrid installations at the Rohingya Refugee Camps in Cox's Bazaar

### **IN 2022, BANGLADESH REACHED 100% ELECTRIFICATION**

as the national grid reached every corner of the country, including the rural communities in char areas that previously did not have access.

While this seemed like the end of the SOLgrid, it was actually the beginning of a technological revolution, which we call the Point of Common Coupling (PCC).

# **100% ELECTRIFICATION**





# POINT OF COMMON COUPLING (PCC)

100% electrification has been one of the largest achievements for Bangladesh in 2022. But, it also meant that the 6 million SHS that were installed by the government - a large government investment and a national asset - became redundant. And technically, so did the SOLgrid.

However, if the SOLgrid - groups of interconnected, peer-to-peer microgrids, were to connect with Bangladesh's national electricity grid, it would give a new life to these 6 million solar home systems, and pave the way for a new global standard for electricity distribution. Thus the PCC was born. 2022 marks a revolutionary year for SOLshare as we broke yet another glass ceiling in energy innovation by launching the PCC at our Saddambazaar grid. Funded by the UK government, in partnership with Shakti Foundation, we have interconnected the Saddambazaar SOLgrid through a single point called the PCC with the national grid, allowing rural villagers to sell energy into the grid.

The event was inaugurated by our chief guest Dr. Tawfiqe-Elahi Chowdhury, Bir Bikram, Advisor to the Hon'ble Prime Minister for Power, Energy & Mineral Resources Affairs, and joined by our special guest Mr. Javed Patel, Acting British High Commissioner to Bangladesh.







The community with the very first PCC installation

### THIS IS THE FIRST TIME SUCH AN ATTEMPT HAS BEEN MADE AND COULD BRING ABOUT **A WHOLE NEW ENERGY REVOLUTION IN INTEGRATING DISTRIBUTED RENEWABLES** INTO THE NATIONAL GRID AS WELL AS **CREATE A SUSTAINABLE WAY FORWARD** FOR THE EXISTING 6 MILLION+ SOLAR HOME SYSTEMS ACROSS THE COUNTRY.

Within 8 months of installation, a community of 20 farmers has fed over 850 kWh of solar electricity into the national grid covering 25% of their average annual electricity consumption, while also earning an additional income of over BDT 35,000 Even while the community faced load shedding, they were able to enjoy uninterrupted electricity.



Expanding this pilot from a single grid to 50 grids potentially means feeding 13.5MWh of electricity into the national grid on a monthly basis, while the prosumers would benefit on average from an additional income stream of BDT 600 per month.



# **THE FUTURE OF HYBR**

### THE FUTURE OF ENERGY LIES IN **BANGLADESH. IF WE CAN DO IT HERE,** YOU CAN DO IT ANYWHERE.

These two lines hold the essence of what SOLshare's technology has achieved so far, and what we aim to achieve in the future. - a Virtual Power Plant (VPP)

Two of today's largest challenges are providing access to high-quality electricity supply and addressing climate change. While energy access has drastically improved over the years for Bangladesh, assuring quality service at an affordable cost for the consumers and the government is where the real challenge lies. This is something we faced in 2022 as the entire country once again faced severe power disruptions, even more so due to the rising cost of fuel globally. There is no doubt that the percentage of renewable energy is increasing, but it still lies at a mere 3% in the energy mix. We need to increase the share of volatile renewable energies while ensuring the transformation of the way we move heat, cool, process, and manufacture while maintaining reliability in services.

**ACCORDING TO** Bloomberg **MICRO-MOBILITY IS REALLY** WHAT'S DRIVING THE ELECTRIC **VEHICLE (EV) REVOLUTION.** 

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# THE RICKSHAW VPP

#### **A Synopsis**

On a typical evening, an Electric Vehicle (EV) driver pulls up to the garage and plugs his drained battery into the outlet to charge overnight. He retires to his home for the night without knowing that his battery is most likely not fully drained of energy. In fact, it is estimated that 25% of the battery's full capacity remains at the end of the day as unused energy. This amount, considering that there are 2.5M EV drivers, can be extremely valuable to a country like Bangladesh that faces electricity shortages and lacks sound renewable energy management.

#### **Renewable energy**

Revol

It is no secret that renewables are the way forward for a sustainable and clean future. While we grapple with challenges to the mainstream adoption of renewable energy such as the lack of opportunities for scaling up, the unpredictable nature of generation, and high costs, there are innovative solutions. These solutions, which usually involve a discussion around storage, can pave the way forward for increasing the use of renewables within the current energy infrastructure. Bangladesh's Mujib Climate Prosperity Plan has renewable energy targets of 30% by 2030 and 40% by 2041 in the national energy mix.

VPP technology posits a solution that makes use of untapped energy reserves in distributed assets such as lithium-ion batteries of electric vehicles. In Bangladesh, there are 2.5 million light EVs (LEVs) running every day.

As mentioned earlier, each of these batteries contains enough energy at the end of the day for utilization. The VPP cloud gives signals to a smart charger on whether to discharge or charge the batteries. The concept of the VPP allows this surplus energy to be fed back into the national grid when there is peak demand during evening hours. Trends suggest that during this time, many drivers are not in business and the LEVs are sitting idle in garages.

Unlike in the Global North where EVs are often charged at home, here the LEVs are predominantly charged overnight in garages. This implies an automatic bundling of distributed storage assets in the same location in the same timeframe, currently being charged at peak-hour tariff rates.

Instead, through the VPP, the energy can be fed into the national grid to serve high demand, and then charge late at night or very early in the morning during super off-peak when the tariff rates are lower. This will address the challenges faced by utility services to balance demand with supply.

#### **VPP - Virtual Power Plant**



**AT SOLSHARE, WE ARE POSITIONED TO DEVELOP A NETWORK OF DISTRIBUTED STORAGE ASSETS AT A SCALE THAT WE BELIEVE RIGHT NOW IS NOT POSSIBLE IN ANY OTHER MARKET** IN THE WORLD.

### **SOLAR POWERED CHARGING STATIONS**

SOLAR PANELS ON ROOFTOPS ARE ALSO DISTRIBUTED **ASSETS THAT PROVIDE GREAT VALUE IN A COUNTRY** WHERE THE SUN SHINES AS REGULARLY AS IT DOES IN **BANGLADESH BUT THE LAND IS SCARCE.** 

The complete VPP solution would include solar panels installed on the rooftops of charging stations. In Bangladesh, garages store and charge groups of LEVs as many as fifty in one location. This allows for greater pooling of resources and the potential to feed back stored energy from the batteries to the national grid through a central location.

Additionally, at the solar power charging stations, the batteries of the LEVs are charged in a sustainable way. We have already seen that the installation of solar panels reduces electricity bills of garages, as the government provides rebates according to the amount of electricity consumption through solar power.

All in all, the VPP takes advantage of the huge potential in distributed assets including millions of battery powered LEVs and solar panels. It provides a solution to existing problems while innovating a more creative pathway to make better use of renewable energy.

THE INTERNATIONAL ENERGY AGENCY (IEA) LISTS VPPS AS ONE OF THE MOST CRITICAL **ELEMENTS IN REACHING A CARBON-NEUTRAL ECONOMY** OR NET ZERO.



#### Facts

Our elaborate Rickshaw VPP white paper outlines key mechanisms that make load shedding history and renewable energy generation the foundation for everything we seek to do with energy.

With the estimated 2.5 million units available in the country today, LEVs have a VPP-potential of 2.5 GW today. This number represents more than 17% of Bangladesh's peak load, which was reported as 14 GW in 2022. SOLshare is positioned to develop a network of distributed storage assets at a scale that we believe right now is only possible in emerging markets like Bangladesh.



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# **SUSTAINABLE DEVELOPMENT GOALS**

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Twenty percent of the population in Bangladesh live below the national poverty line, according to the Poverty Watch Report 2022.

As a middle-income economy, escaping poverty has been the goal of many, but unfortunately achievable by a smaller percentage.

Since its initiation, one of SOLshare's key aims has been to reduce poverty in Bangladesh by making its technology and services accessible and affordable and allowing the end users to earn an income through these services.

SOLshare's very first technology, the SOLgrid, has allowed its end users to sell electricity directly from the sun,. Through this, households and businesses in remote areas, which were otherwise deprived of electricity and business, were revived.

SOLmobility has allowed electric three-wheeler drivers to lease smart batteries instead of paying a big sum upfront. This, paired with other benefits have made it easier for drivers to earn a higher income.



NO Poverty



Although Bangladesh performs splendidly in terms of SDG 5, by being the most gender-equal country among South Asian nations, gender inequality is not yet erased.

It is even more so persistent in the Bottom of the Pyramid (BoP) population, one that has influenced most of SOLshare's developments.

Through the establishment of the SOLgrid in remote areas of Bangladesh, more women were able to use clean energy to become solar entrepreneurs. Access to electricity allowed them to continue their activities such as work and studies even after dark, no longer having the difficulty of a kerosene lamp. Additionally, SOLshare's DEG project distributed smart home appliances to the SOLgrid end users, through which they were able to establish their own businesses.

Pictured below is Aleya Begum, the owner of a one-of-a-kind solar-powered refrigerator, powered through the SOLbox. Through this, she sells one of the hottest-selling products in the temperate village summer- cold drinks.

While the electric three-wheeler sector still remains a male-dominated industry due to the risks associated with it, changes introduced through SOLmobility such as intraday charging and the involvement of less manual labor open up opportunities for women in the e-mobility sector. Additionally, it also provides a safer means of transportation for women across the country.



**5** Gender Equalit



The core of SOLshare's technology and development is based on providing clean, accessible, and affordable energy, making SDG 7 the most important sustainable development goal for the company.

SOLshare's peer-to-peer microgrids are a key example of this, as it allows end users to access clean energy while sharing it with their peers who would otherwise be left in the dark. Moreover, the PCC further allows the excess electricity from the SOLgrids to be fed into the national grid, hence channeling the clean energy supply from the rural grids to the entire nation.

Our SOLmobility technology employs solar charging paired with smart batteries, together creating a much cleaner and greener energy supply. Using solar PV reduceselectricity costs for garage owners by 40%, while smart batteries also require 40% less charge - a win-win situation for all.

Our venture into the solar rooftop market, or as we like to call it - SOLroof, is the final touch to our line of services as it allows all C&I to install solar panels on their rooftops, bearing the benefit of access to clean energy, cheaper electricity bills, and the opportunity to feed their excess energy into the national grid.



7 AFFORDABLE AND CLEAN ENERGY



The unemployment rate in Bangladesh has been on a slow decline, with 5.4% in 2022.

However, the market was heavily affected during the COVID-19 pandemic which also resulted in the loss of <u>5 million</u> full-time jobs in the same year.

SOLshare's peer-to-peer microgrids provided large support during this difficult time when employees migrated back to their rural homes in masses, by allowing them to work and earn again. Selling their excess electricity was one of the easiest ways for many community members to earn an additional income. Moreover, with smart DC appliances, users were able to set up their microbusinesses such as small shops for tailoring services or household goods to earn an income.

The electric three-wheeler scene is yet another that holds much potential for decent work, with more than 2.5 million vehicles plying the streets of Bangladesh. And with SOLmobility's leasing services, it allows more to join as it eliminates the upfront capital expense of purchasing expensive batteries through high interest loans. Furthermore, the existing E3W market also benefits from this technology as it provides drivers with more transparency on their mileage, state of charge, improved technology, and financing mechanisms, making it more efficient and accessible for all.



DECENT WORK AND ECONOMIC GROWTH



SOLshare is creating resilient communities using innovative infrastructure which promotes sustainable development and socioeconomic growth.

Through access to clean, affordable solar energy through our grids and in rooftop solar and energyefficient technology in e-mobility to make electric three-wheelers more viable and efficient.

This is achieved through our SOLgrids as it provides rural communities with access to clean, affordable solar energy, allowing them to leverage the power of the 6 million existing solar home systems which would otherwise be redundant. On top of the SOLgrid, the introduction of the PCC further adds to this particular sustainable development goal by connecting these rural households directly to the national grid, whereby a small rural community is contributing to co-powering the country

With our SOLmobility tech, innovation becomes the true key that is changing this E3W industry. What used to be a hazardous, uncoordinated, and unsustainable industry, now has the potential to drive the change toward climate change. With smart batteries and our leasing model, paired with solar-equipped charging stations, the E3W industry becomes more viable, and efficient, and takes the lead in reducing the impacts of climate change.

Our latest service, solar rooftop installation services, fit right into this SDG as it allows the manufacturing industry, one of the largest contributors of climate change, to take a step towards minimizing emissions through solar power.



**9** INDUSTRY, INNOVATION AND INFRASTRUCTURE

Poor people do not need cheap products, but highquality products that are made affordable. This depicts what SOLshare stands for and

how our technology is created to cater to the population that is in need of affordable and quality products for better livelihoods.

Through the P2P microgrid, rural communities are able to earn an excess income straight from the sun, making it an accessible form of income for all, including women who were otherwise unable to find work in their areas.

SOLshare's e-mobility solution is one that makes it easy for everyone to become an E3W driver while ensuring that current drivers have an increased and reliable source of income without continuously being trapped in a debt cycle.

The disparity in income distribution in Bangladesh needs more focus and action.

Together, by providing access to affordable energy and energy-efficient technologies along with the opportunity to earn an increased income for those at the bottom of the pyramid within vulnerable communities, SOLshare is reducing income and gender inequalities by bridging the disparity gap.



**10** REDUCED INEQUALITIES



At the very heart of a sustainable communities lies sustainable forms of energy - one that SOLshare provides through all of its services.

The P2P microgrid has helped create sustainable communities in rural areas that were initially left behind. Now, they have a source of reliable income and energy that is available during power outages, and an extra income when there is excess electricity.

Bangladesh has a large existing E3W market, and our technology is making it sustainable. Replacing harmful LA batteries with longerlasting LI batteries, cutting down charging times and reducing grid electricity consumption with solar-equipped charging stations while out smart battery tech provides data insights all contribute towards creating a sustainable E3W industry.

SOLroof also plays an important role as it is transforming the commercial and industrial sector by covering their large rooftops with solar PV that is net metered thereby reducing emissions, feeding clean energy back into the grid and reducing electricity costs.



**11** SUSTAINABLE CITIES AND COMMUNITIES



As a climate-tech company, climate action is at the forefront of SOLshare's goals, making it the center of all our work.

Through our services, clean energy is being unlocked by integrating existing infrastructure with innovative clean energy technologies, backed by engineering and scientific studies.

This is executed through our SOLgrids, that are sharing excess solar energy within rural communities and through the PCC feeding it to the national grid, increasing energy efficiency and minimizing energy waste; our SOLmobility services using solar-equipped charging stations and smart batteries which require less 40% less electricity to charge and reduces harmful emissions; and our SOLroof services reducing the carbon footprint of manufacturing industries.

In 2022, all of our services combined reduce more than 650 mtCO2 annually, and the number is growing as we continue to scale our services throughout the country.





# USER STORIES MEET SOHOR ALI

### SOHOR ALI STARTED WORKING FROM AN EARLY AGE, Right After graduating with a diploma in Engineering from the polytechnic institute, Mirpur, dhaka in 1994.

He gathered work experience abroad where he worked as a construction foreman, while sending money home to his family in Bangladesh. Some of the places he worked include Singapore, Malaysia and Saudi Arabia.

When COVID-19 hit, Ali was forced to leave his job and return home to Bangladesh. However, even during unprecedented times, he didn't give up. He opened a rickshaw garage and an electric-vehicle parts shop. But he didn't stop there. Using his experience and skill set in light engineering, Ali started building EV rickshaws himself. He ended up making 26 vehicles, which gives him his crucial daily income from leasing to keep his business afloat. Today, Ali's target is to add 10 more EVs to his fleet in order to further his income and be able to take good care of his family.

#### Challenges

- CAPEX required in order to purchase leadacid batteries: he will need BDT 500K up front and the remaining to be paid on a monthlybasis
- Rising electricity costs: Ali currently pays BDT 46K monthly

SOLSHARE'S TECHNOLOGY HAS HELPED ME REDUCE MY COSTS SIGNIFICANTLY, WHICH HAS MADE MY BUSINESS FRUITFUL. I'M CONFIDENT AND HAPPY TO BE USING MODERN TECHNOLOGY TO BOOST MY SMALL BUSINESS. IT MAKES ME HOPEFUL ABOUT THE FUTURE



#### Solution:

SOLshare has been working towards solving the issue of access to deficit sustainable energy services and the fundamental understanding that low-income people don't need cheap products, but high-quality ones which are designed for them and made afforable. With SOLshare's Pay-As-You-Go solution, Sohor Ali can pay for the batteries through a leasing model, negating his need for a heavy CAPEX. The smart batteries which have been leased to Ali also allows him to conserve his electricity cost by 40%, which is 80% of his OPEX. With the amount he is saving, he can pay his garage rent and get closer to a better livelihood for his family, focusing on improving his standard of living and enabling his children a better education.

Sohor Ali is just ONE example amongst the 4 million stakeholders currently working in the electric three wheeler industry in Bangladesh. SOLshare is tirelessly working to solve the issues of these EV drivers in Bangladesh and create new business propositions.





### **ALEYA BEGUM A SOLGRID BENEFICIARY**



### **MD. ABDUL KHALEK PCC BENEFICIARY**

benefit us as well as the country, and we are





### ZAVED AKHTAR **CEO & MD - UNILEVER BANGLADESH**

Wonderful partnership with ME

SOLshare Ltd and Unilever Bangladesh to move our needle a bit towards netzero





My SOLbox lets me proudly power my DC fridge. This one-of-a-kind solar-powered refrigerator has allowed me to sell one of the hottest-selling products in the temperate village summer- cold drinks.

### SOLROOF PROJECTS



**2022 HAS BEEN AN ACTIVE YEAR FOR** SOLSHARE IN TERMS OF NEW PROJECTS. FROM **SOLAR-POWERED CHARGING STATIONS TO** SOLAR ROOFTOP INSTALLATIONS, FIND A BRIEF **DESCRIPTION OF OUR TOP PROJECTS BELOW**, FOLLOWED BY A DETAILED LIST OF ALL THE **PROJECTS THAT TOOK PLACE IN 2022.** 

### **GREENER GARMENTS INITIATIVE LTD**



### FOR THE FIRST TIME EVER IN BANGLADESH. A CLIMATE TECH **COMPANY AND A GLOBAL FASHION BRAND HAVE JOINED FORCES**

to create an ESCO company to develop and set up solar rooftop installations across the country for a greener supply chain. SOLshare and Heartland (holding company of global fashion brand BESTSELLER) joint venture Greener Garment Initiative Ltd. will be building, owning, and operating solar rooftop projects across several of BESTSELLER's suppliers in Bangladesh. Solar PV rooftop installations are increasingly becoming the default choice for the garment industry in the country due to their profitability and sustainability across the entire value chain.



Unilever

SOLshare has installed and commissioned 40kWp of rooftop solar on one of Unilever's sales depots. Electrification of their distribution fleets to follow! Unilever has always led the way in upholding industry best practices & here they are again progressing to make good on their promise to become net zero by 2039 one step at a time.





British High Commission Ltd

SOLshare has installed and commissioned a 15.93 kWp grid-tied rooftop solar at the British High Commission for its office in an attempt to move to renewable energy and reduce carbon emissions. The solar power generated will be offset against the High Commission's electricity consumption from the grid.





#### **Knit Concern Limited**

SOLshare commissioned a 250kWp rooftop solar plant in Narayanganj at Knit Concern Group's garment factory, with the support of the Project Development Programme (PDP), run by GIZ as part of the German Energy Solutions Initiative on behalf of the German Federal Ministry for Economic Affairs and Energy (BMWi).



### ROHINGYA REFUGEE CAMP LIGHTHOUSE PROJECT IN PARTNERSHIP WITH UNHCR, THE UN REFUGEE AGENCY, Solshare Piloted 2 P2P Solar Microgrids in one of The largest refugee camps in the world - the Rohingya Refugee camp in Cox's Bazar, Bangladesh.

This project deployed multiple solar energy generation and storage assets (SHS) across 50 households to form two p2p solar microgrids. Each grid comprised 25 households; later on, these 2 grids were then interconnected to further strengthen the network and increase energy efficiency allowing energy exchange among all 50 households. Through access to electricity the Rohingya refugees under the grids have been able to enjoy lights after dark and fans in hot summer months allowing the communities to assimilate better.





### **BAT LIGHTHOUSE PROJECT** UNDER OUR E-MOBILITY SERVICES - SOLSHARE IN Partnership with bat bangladesh, btomorrow Ventures, bat global, and rajshahi city corporation Launched A green, regulated ev charging pilot in Rajshahi

to help improve EV driver's livelihoods. Implemented in Bangladesh's greenest and cleanest city, Rajshahi The project deployed the very first solar PV-equipped charging station in Bangladesh alongside smart batteries. Together these lowered electricity costs for the garage owner while improving drivers' incomes by 27%

#### LAUNCHING THE PCC

FUNDED BY THE UK GOVERNMENT, IN PARTNERSHIP WITH SHAKTI FOUNDATION, WE HAVE INTERCONNECTED ONE OF OUR P2P SOLAR Microgrids

- a network of interconnected solar home systems, in a rural village in Bangladesh through a single point called the Point of Common Coupling (PCC). This first global innovation will allow rural villagers to sell energy to the national grid. The event was inaugurated by our chief guest Dr. Tawfiq-e-Elahi Chowdhury, Bir Bikram, Advisor to the Hon'ble Prime Minister for Power, Energy & Mineral Resources Affairs, and joined by our special guest Mr. Javed Patel, Acting British High Commissioner to Bangladesh - it was truly an auspicious day.



### **SMART CHARGING FOR GREEN RIDES** SOLSHARE IS NOW ON THE LIST OF P4G'S NEW PARTNERSHIPS THAT ARE DRIVING ENERGY TRANSITION IN DEVELOPING COUNTRIES.

Through this partnership, SOLshare, in partnership with IDF, is addressing the informal and fossil fuel-powered electric threewheeler charging infrastructure in Bangladesh through Smart Charging for Green Rides.

SOLshare will expand electric three-wheeler adoption in Bangladesh by improving pay-as-you-go technology for batteries, making threewheelers more sustainable, and helping to boost driver incomes by 25%, improving livelihoods for a Net Zero future.



# **2022 PROJECTS**

#### **DEVELOPMENT PARTNER-FUNDED PROJECTS:**

Project: Smart Charging for Green Rides. Date of Initiation: January 2022 Status: Ongoing Location: Bangladesh Donor: P4G Partner: Integrated Development Foundation (IDF) Main project features: Evaluating and strengthening the lithium-ion battery supply chain and developing an improved, robust, and scalable smart dongle that supports lithium-ion batteries.

#### **COMMERCIAL PROJECTS:**

Project: Rooftop Solar Panel Date of Initiation: November, 2022 Status: Ongoing Location: Bangladesh **Client:** Body Fashion Limited Main Project Features: Installation of 562 kWp gridtied rooftop solar PV system at the Body Fashion Limited garments factory.

Project: Rooftop Solar Panel Date of Initiation: December, 2022 Status: Ongoing Location: Bangladesh **Client:** Hydroxide Knitwear Limited Main Project Features: Installation of 269.28 kWp grid-tied rooftop solar PV system at the Hydroxide Knitwear Limited garments factory

Project: Rooftop Solar Panel Date of Initiation: September 2022 Status: Ongoing Location: Dhaka **Client:** British High Commission Main project features: Installation of 15.90 kWp gridtied rooftop solar panel solution at BHC

Project: Pay As You Go [PAYG] Micro-Credit Program for EV Garages

Date of Initiation: Jan 2022 Status: Ongoing **Client:** Integrated Development Foundation (IDF) Main project features: Test the business case for the sustainable dissemination, management, and financial inclusion of Micro Small Medium Enterprise (MSME).

**Project:** Rooftop Solar Power Solution Date of Initiation: July 2022 Status: Done Location: Bogura **Client:** Unilever Sales Depot Main project features: Installation of 39.6 kWp netmetered rooftop solar PV system at the Unilever Sales Depot.

Project: Rooftop Solar Power Solution Date of Initiation: March 2022 Status: Done Location: Dhaka **Client:** Knit Concern Limited Main project features: Installation of 249.6 kWp gridtied rooftop solar PV system at Knit Concern Limited garment factories.

**Project:** Rooftop Solar Power Solution Date of Initiation: April 2021 Status: Done Location: Gazipur, Dhaka **Client:** IRIS Fabrics Limited Main project features: Installation of 145 kWp grid-tied rooftop solar PV system at the IRIS Fabrics garment factory.

#### **RESEARCH & DEVELOPMENT FUNDED PROJECTS:**

Project: Sustainable Dissemination, Management, and **Operation of a Charging Garage** Date of Initiation: June 2022 Status: Ongoing **Donor:** Clean Rides Limited Main project features: Business case for sustainable dissemination, management, and operation of a charging station garage.

#### **CONSULTANCY PROJECTS:**

**Project:** Modern Energy Cooking Services **Client:** MicroEnergy International Date of Initiation: October 2022 Status: Ongoing Location: Bangladesh Main project features: Consultancy services for an in-depth exploration of cooking entirely with electricity via ICT-enables services in a range of households.

**Project:** GIZ PAP Consultancy Client: GIZ Date of Initiation: March 2022 Status: Completed Location: Bangladesh Main project features: Consultancy services for the assessment of an overview of renewable energy & energy efficiency technology with dissemination potential in Bangladesh.

**Project:** GIZ EERGIE Consultancy Client: GIZ Date of Initiation: May 2022 Status: Ongoing Location: Bangladesh Main project features: Consultancy services for energy efficiency and grid integration of renewable energy business case demonstration for solar battery charging in Bangladesh.

**Project:** GIZ Net Metering Consultancy Client: GIZ Date of Initiation: July 2022 Status: Ongoing Location: Bangladesh Main project features: Consultancy services for the technical support in roll out of net metering applications in Bangladesh





# **EVENTS**

### EXPO 2020 DUBAI

### THE WORLD EXPO IS ONE OF THE OLDEST AND Largest global events, taking place Every five years.

In 2022, the event took place in Dubai and welcomed over 24 million visitors. 192 participating countries exchanged new ideas and perspectives under Expo 2020's theme, "Connecting Minds, Creating the Future."

Representing SOLshare Ltd, Eshrat Waris, Director, took the stage alongside Prince Wiliam as part of the first-ever innovation showcase of the Earthshot Prize hosted by DP World at Expo 2020 Dubai.



### THE EARTHSHOT PRIZE INNOVATION SUMMIT

THE EARTHSHOT PRIZE INNOVATION Summit took place on the 20th of September 2022 at the plaza hotel, New York, the same week as climate Week and the United Nations General Assembly.

As an Earthshot Prize 2021 Finalist under the category of Fix Our Climate, our Founder and Managing Director, Dr. Sebastian Groh had the honor to address the occasion as a panelist in the Catalyzing Innovation session, which was followed by a fireside chat featuring Bill Gates. The finalists were also joined by Prince William, Duke of Cambridge, and Mike Bloomberg, former Mayor of New York City.





### EARTHSHOT PRIZE 2022 AWARDS CEREMONY

### ESHRAT WARIS, ONE OF SOLSHARE'S DIRECTORS HAD The opportunity to represent solshare at the 2022 Earthshot Awards ceremony held at the Mgm Music Hall in Boston, Massachusetts.

The star-studded event was attended by Prince William and Princess of Wales along with Earthshot Prize Council Members Christiana Figueres, Indra Nooyi, Hindou Oumarou Ibrahim, and Naoko Yamazaki, and a host of artists and advocates including Annie Lennox, Billie Eilish, David Beckham, Ellie Goulding, and Rami Malek.

# **AWARDS & ACHIEVEMENTS**

**SOLSHARE HAS WON MANY PRESTIGIOUS AWARDS FOR ITS INNOVATIVE WORK OVER THE YEARS. SEE WHAT WE HAVE ACHIEVED IN 2022** 



### Winner of the **ZAYED SUSTAINABILITY PRIZE 2022**

in the Energy Category



### Winner of the **BASIS NATIONAL ICT AWARDS 2022**

for Sustainability and Environment **Category of Inclusions and Community Services** 

### **OTHER AWARDS & ACHIEVEMENTS THROUGHOUT** THE YEARS

- Climate" Category

- Eight)
- Network Award 2019

- Bangladesh
- Environment (BMUB)
- Want Grant
- **Energy Society**
- Award at COP22
- Solar Project"

• Finalist for the Earthshot Prize 2021 in the "Fix Our • Winner of the Ashden Awards 2020 for Financial and **Business Model Innovation in Energy Access**  Winner MIT Solve's 2020 Global Challenges for Good Jobs and Inclusive Entrepreneurship 2019& 2020 Global CleanTech 100 Company • Unilever Young Entrepreneurship Award 2019 (Top • Winner of the Siemens Stiftung empowering people • UBS Global Visionary 2019 • Winner Energy Globe Awards 2019 • Winner of Free Electrons Accelerator Program 2018 as world's best energy startup • Winner of the Microsoft 2018 Airband Grant Fund Winner of the 2018 GIZ-Endev Innovation Competition • World Economic Forum Tech Cohort '2018 of the most game-changing start-ups in the world Winner of the BASIS National ICT Awards 2018 in

• Winner of the 2018 MIT Inclusive Challenge Asia • Winner of the 2018 IKU Award by the German Industry Association (BDI) & the German Ministry of • Winner of the 2017 UNDESA Powering the Future We

 Winner of the 2017 Renewable Transformation Challenge by Elsevier Energy & the International Solar

 Winner of the 2017 Start-Up Energy Transition Challenge by DENA (German Energy Agency) Winner of the 2016 UNFCCC Momentum for Change

• Winner of the 2016 Intersolar Award "Outstanding

# **BOARD OF DIRECTORS**



Hannes Kirchhoff Chief Technology Officer (CTO), Co- Founder



in

**Dr. Sebastian Groh** Chief Executive Officer (CEO) Chairman of the Board, and Co-Founder

He is an energy and process engineer by background, holds a master's degree in renewable energy systems engineering, and pursues a Ph.D. in DC microgrids. Before joining SOLshare, Kirchhoff 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 an 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. Dr. Groh is a 2013 Stanford Ignite Fellow from Stanford Graduate School of Business and holds a Ph.D. from Aalborg University and the Postgraduate School Micro Energy Systems at the TU Berlin where he wrote his doctoral thesis on the role of energy in development processes, energy poverty & technical innovations, with a special focus on Bangladesh. He published a book and multiple journal articles on the topic of decentralized electrification in the Global South.

Dr. Groh started his career and received his DNA at MicroEnergy International, a Berlin-based consultancy firm working on microfinance and decentralized energy. In 2014, Dr. Groh co-founded SOLshare, acting as its CEO since then. He is also an Associate Professor at the BRAC Business School at BRAC University in Dhaka (Bangladesh). On behalf of SOLshare, he received numerous awards, including Tech Pioneer '18 by the World Economic Forum, the empowering people Network Award 2019 from the Siemens Stiftung Foundation, Finalist at the inaugural Earthshot Prize 2021, the most prestigious global environment prize in history launched by Prince William, and 2022 Winner of the Zayed Sustainability Award.

Dr. Groh became an Ashoka Fellow in 2018, a UBS Global Visionary in 2019, and a Member of the Board and Vice President at the Bangladesh-German Chamber of Commerce & Industry (BGCCI) in 2021. Daniel holds a Master's in Economics from the University of Trier with a specialization in 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.

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 productmarket fit, and 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.

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.





Daniel Ciganovic Chief Financial Officer (CFO), Co-Founder

# **NON-EXECUTIVE BOARD OF DIRECTORS**





**Giancarlo Savini** Investment Director - Climate Tech, Future Energy Ventures, E.ON





has been involved in 23 deals and driving directly two exits.

He was awarded a GCVI Global Energy Award in 2019 and taught Corporate Venture Capital and Innovation at IMD Business school. At EDP, Luis is responsible for EDP's open innovation mechanisms: EDP Rob started to mentor SOLshare on financial issues in 2013 when corporate venture capital.

sector.

partnership, and other startup development initiatives.

Giancarlo Savini is the Cimate Tech Investment Director at Future Energy EDP is an energy producer, distributor, and retailer with 12 million Robert is the Managing Director, Portfolio Management for the Impact Ventures, the venture investment arm of German utility giant E.ON. An customers in Portugal, Spain, and Brazil. Its renewable power business is Investment Exchange (IIX) based out of Singapore. IIX is a global engineer by training with over 15 years of early stage technology present in 14 countries including the US and Brazil. EDP Ventures SA is the organization dedicated to building a more inclusive world as the management experience and 6 years of investing experience, Giancarlo early-stage corporate venture capital fund of the EDP Group, with the foundation for sustainable peace. IIX does this by changing financial aim to support and stimulate the open innovation process in the energy systems and innovating solutions for women's empowerment, climate action, and community resilience.

Giancarlo alos co-authored several publications on material science and Ventures SA (corporate VC fund), EDP Starter (business incubation SOLshare came 3rd in the CTI PFAN business plan competition. The program), the Open Innovation award, Free Electrons accelerator engagement which came as part of the prize was originally intended to be one year. However, the relationship between Rob and SOLshare in fact never stopped. Today, Rob is sitting on our Board representing the IIX Growth Fund.



In **Robert Kraybill** Managing Director Impact Capital Holdings Pte. Ltd

# **LEADERSHIP TEAM**





**Director of Operations** 

Aziza holds a Bachelor's 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. She possesses over 15 years of experience in the blend of retail and development sectors in 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 codeveloped the smart entrepreneurship approach at SOLshare with an emphasis on its female endusers As the Head of Operations of SOLshare, Aziza is leading the field operations, sales, aftersales, customerrelations, and production unit and has played a major role in establishing SOLshare in the local energy market in Bangladesh.





**Eshrat Waris** Director of Product

Eshrat Waris is a product development and business strategy specialist with international economics acumen based in Bangladesh's technology sector, with more than a decade of experience delivering innovative solutions to complex business needs. She is recognized for scaling impact through strong cross-sector collaboration with public. private, and non-profit stakeholders.

Eshrat 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. Currently, she is on sabbatical from SOLshare to pursue her mid-career MBA as a Sloan Fellow at MIT Sloan School of Management. 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 headquarters working on protection, urban, and social governance issues. In 2021, Eshrat was selected as a changemaker in the 2nd Bangladeshi cohort of the Acumen Fellowship.





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

Istiague completed his Bachelor's from the Chittagong University of Engineering & Technology, and his Master's in Business Administration (Finance) from the Institute of Business Administration at Dhaka University. Ishtiague has worked in the renewable industry for over 13 years with a focus on solar, and DRE. His expertise in Photovoltaics includes floating solar system assessments, MW Solar IPP design, grid connection, off-grid, and hybrid PV systems, and Solar pumping systems. He has worked on feasibility studies, system design specifications, project rollouts, and program design. Ishtiaque has extensive knowledge of rural energy programs, renewable energy-based agriculture interventions, solar rooftops, and solar park design. Prior to SOLshare, Ishtiaque was working at Rahimafrooz Renewable Energy Ltd. as the Head of Off-grid. Ishtiaque is a member of the Institution of Engineers (IEB) in Dhaka as well as a member of the Bangladesh Solar Society. He is also the Chairman of the Power Electronics Subcommittee.





Isa Abrar Ahmed Director of Business Development

Isa Abrar completed his Bachelor's at the American International University - Bangladesh (AIUB), with a Summa Cumm Laude. Abrar has more than 10 years of experience in technology through his previous roles.

Prior to SOLshare, he led sBusiness.xyz (Sheba Platform Ltd.), a B2B SaaS company, with several large-scale ICT projects with Bikroy.com, worked with Samsung Electronics as a Product Manager for IT Products, and local conglomerate Aamra Companies.





### in

Salma S. Islam Head of Projects, Fundraising and Communications

Salma 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-sectorfunded 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.

## **ADVISORY BOARD**



Sonia Bashir Kabir Founder of SBK Tech Ventures & SBK Foundation

Shareholders



Shahriar Ahmed Chowdhury Director, Centre for Energy Research of UIU

in



Noara Kebir Managing Director at Microenergy International



**Daniel Philipp** Chairman, MicroEnergy International GmbH



Dr. Hartmut Schüning H. S. Hamburg Solar GmbH





Mohammed Monir-uz-Zaman Director at Ahmed Mashuque & Co.



### 🔘 Berkeley

C ENERGY

Dr. Daniel M. Kammen

Director of Renewable and Appropriate Energy Laboratory (RAEL) University of California, Berkeley, Former Science Envoy at U.S. Department of State; Class of '35 Distinguished Chair in Energy, University of California, Berkeley





Karthik Chandrasekar Founder & Chairman of Sangam Ventures



Andrew Reicher Investment Committee Member, Asia, and Africa at Berkeley Energy







# OUTLOOK

SOLshare is offering an unique investment opportunity with a solid revenue base and a strong upside potential, pooling synergies to implement our strategy and work towards the VPP vision:

#### The revenue base:

SOLroof is a non cash intensive business with a transfer of risks, funded through SPVs:

1. The current SOLroof business model needs minimal investment to generate a positive cashflow - the SPVs showing a clear, accelerated path to profitability.

2. Contracts signed with some of the largest garment manufacturers in the country representing a pipeline of 12 MWp as of today, as well as reputable MNCs, e.g. Unilever, etc. with additional 15 MWp.

#### The upside potential:

3. SOLmobility is our venture in a fast and enormous growing market (US\$ 5bn today) where SOLshare is excellently positioned to capture this exponential growth with a projected 36x return over five years.

4. Our proprietary platform technology, patented in Germany, will continuously increase our digitized energy storage portfolio.

#### The synergies:

Each business line has its unique upside while offering great synergy effects across. To reach a large scale for SOLmobility, we need a significant track record with key players in the ecosystem via SOLroof.

6. Strong reputation and relationship with key government agencies through SOLgrid and SOLroof projects at large scale with significant utility-level visibility.

#### The strategy:

Thanks to the utility-scale visibility that SOLroof provides till then, we can also rollout SOLmobility with high pace and adopt it on charging stations: 7. Despite the steady growth of SOLroof, we expect that by mid 2024 SOLmobility will take over as the most important revenue stream. From 2026 onwards we reckon with more than US\$ 20M per annum in revenues.

8. Our goal is to facilitate and reach a nation-wide roll-out of solar PV-equipped charging stations, a truly holistic approach to sustainability.

#### The vision:

There is a unique opportunity to operationalize the fluidity between the transport and electricity sector culminating in the rickshaw VPP: 9. This is the opportunity for a mass scale roll-out of IoT equipped and aggregatable mobile storage units, serving a primary and secondary market. 10. SOLshare becomes the key player in facilitating the network integration of renewable energy in Bangladesh due to the flexibility portfolio it offers.

Revenue Evolution







# THANK YOU

To all our partners, investors, customers, supporters, employees, and wellwishers, we thank you for staying with SOLshare.

With your support, SOLshare was able to put Bangladesh on the World Map while serving more than 50,000 beneficiaries.

Stay with us as we continue to provide vulnerable communities access to awesome energy services.



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