



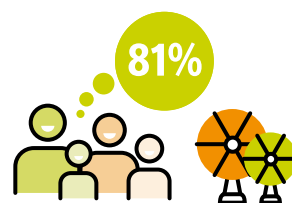
# Solar-powered fans can help support SUSTAINABLE FUTURES

## ! THE PROBLEM

### Why fans?

Amid climate change, appliances such as fans can be lifesaving, especially for women and the elderly who traditionally spend more time at home. Many people who need fans do not currently have access to them. Compared with other technologies, such as air-conditioners, efficient and solar-powered fans are a low-cost and practical solution to keep people cool. They are accessible for people with low incomes and better suited to those living in rural areas that are not connected to the national electricity grid.

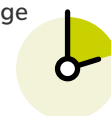
In a survey of **1,600 solar-powered fan customers** in Bangladesh...



**QUALITY OF LIFE:** 81% believed that their lives had improved because of their fans.

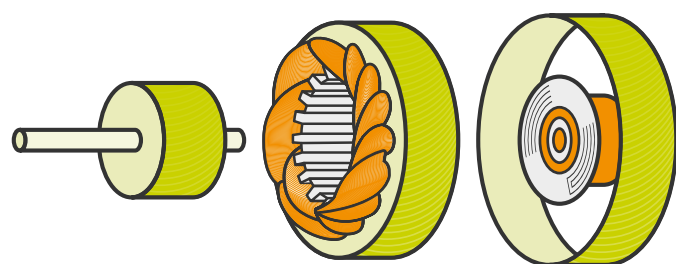
### IMPROVED WORK RATE:

Households reported that their fans enabled them to work for an average of **2hrs and 20 minutes** extra per day.



### HEALTH BENEFITS:

Fans improve indoor **air flow** and reduce the risk of dehydration. 92% reported general health improvements.



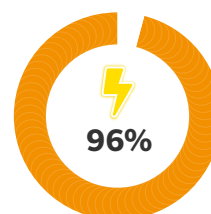
Visualisation of a PM direct current motor

### What are highly efficient fans?

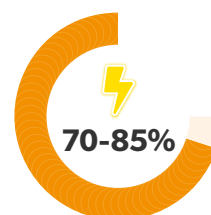
- Fans using an efficient motor, such as a Permanent Magnet (PM) direct current motor, can reduce energy consumption by nearly 50%.
- PM direct current motors are likely to last eight years compared to just 6–12 months for conventional motors. The motors need to be replaced less often, resulting in less e-waste, more reliable products and a lower long-term cost.

### Why is this important?

- Climate change threatens lives, food security and jobs. Countries in South Asia are disproportionately impacted by **rising temperatures**.
- Extreme heatwaves kill at least **12,000 people** around the world per year, and one billion people face immediate risks from lack of access to cooling.
- It's estimated that **80 million people** across the world's poorest countries will lose their jobs due to heat stress by 2030.
- Many of these people live in rural communities and lack access to electricity to power appliances. In South Asia, 96% of people have access to electricity, yet progress is faster in some countries compared to others. In Pakistan and Bangladesh, **15–30% of people** still lack access to electricity.



access to electricity in **South Asia**



access to electricity in **Pakistan & Bangladesh**

# EFFICIENCY FOR ACCESS



## WHAT'S THE SOLUTION?

The Low Energy Inclusive Appliances (LEIA) programme has provided support to businesses and organisations working to improve the efficiency, affordability and availability of solar-powered fans across South Asia.

### Case study: tackling market barriers in Pakistan

|                              |   |  |   |
|------------------------------|---|--|---|
| <p><b>MARKET BARRIER</b></p> | <p><b>Absence of quality assurance</b><br/>The solar-powered fan market is mostly unregulated, and fans are rarely formally tested. As a result, customers can often only access low quality products.</p>                        | <p><b>Limited investment into research and development</b><br/>Established manufacturers often focus on fans that are suitable for households that are connected to the national grid, rather than those compatible with solar home systems.</p> | <p><b>Low appliance efficiency</b><br/>Inefficient fans consume large amounts of energy. In order to generate enough power, they require a large solar home system which is unaffordable for low-income customers.</p>  |
| <p><b>OUR ACTIVITIES</b></p> | <p>LEIA developed a quality standard and test method for off-grid fans. This was introduced to the Pakistan Council of Scientific &amp; Industrial Research and the World Bank funded Sindh Solar Energy Project in Pakistan.</p> | <p>The <b>Efficiency for Access Research and Development Fund</b>, managed by Energy Saving Trust, awarded <b>Harness Energy</b>, Pakistan a grant to develop highly efficient solar-powered fans for use in rural and hard-to-reach areas.</p>  | <p>Fan efficiency tests carried out by LEIA prompted companies to improve the efficiency of their products and adopt PM direct current motors. Highly efficient fans can be powered by a smaller and cheaper solar home system, making them more affordable for low-income customers.</p> |

### These activities contributed to increased access to super efficient solar-powered fans:

- ➔ It is predicted that the solar-powered fan market has the potential to grow significantly, reaching US\$1.4 billion by 2030 (**Efficiency for Access**).
- ➔ Overall demand for fans is strong and growing in rural contexts. In 2019, GOGLA affiliates reported selling 670,000 fans globally. The majority of which were sold in Pakistan, Bangladesh, and India (**Efficiency for Access**).
- ➔ Our work has contributed to over 5 million people gaining access to highly efficient fans (**GOGLA, 2021**).



**Muhammad Shehyar**

Managing Director and Founder, Harness Energy, Pakistan

*Pakistan is a very hot country and customers have a basic need for fans. Improving the efficiency of fans has many benefits, particularly for low-income customers as they can help them save money.*

# EFFICIENCY FOR ACCESS

## The people behind the products

Fans can help people improve their quality of life, work rate and overall health. We spoke to some of the people living in Pakistan and Bangladesh who discussed the challenges they have witnessed given low access to electricity and fans.



**Ghulam Mustafa**

Harness Energy customer,  
Pakistan

➔ Ghulam has run his own furniture repair workshop since 2009

“*Summers are usually very tough on the body due to the heat and humidity. I was using a basic pedestal fan to keep cool in the extreme temperatures. Unfortunately, paying the bills for my workshop has become difficult due to the rising cost of electricity and business losses during COVID-19. I heard about this efficient solar fan from a nearby retailer, so I purchased it in instalments from Harness Energy. The fan has turned out to be a blessing as my bill has reduced from \$21 USD per month to \$13 USD. With this saving I have paid off the cost of the fan already.*”

➔ Tofael has seen the direct impact solar-powered fans can have on an individual's life through his work at Super Star Group

“*Village shopkeepers, particularly in the rural areas, are too hot during the summer season to work. They must close their shops and go home to stay cool. Now, with the help of solar fans they can earn a higher income and keep their shops open.*”



**Tofael Ahmed**

Chief Operating Officer, Super  
Star Group, Bangladesh



**Nukhti Bibi**

Harness Energy customer,  
Pakistan

➔ Between caring for her family of seven, Nukhti Bibi, earns her living through subsistence farming and rears livestock

“*Electricity outages are very common in villages. At the height of the COVID-19 pandemic, we used up a lot of our savings, so could not purchase the solar system with cash. Now we run our solar directly and pay back the instalments from our business revenue. We are at peace now with our solar system. Now we can cook, eat, and sleep comfortably because of this fan.*”

➔ Rezaul has run a small shop in a seaside town since 2018

“*Before purchasing our solar home system, we used grid electricity to run all the appliances in our house and shop. However, grid power goes out for an average of 10 hours per day. I've seen a 25% increase in business since purchasing a TV and fan.*”



**Mohammed  
Rezaul Karim**

Rahimafrooz customer,  
Bangladesh