GOGLA

The Voice of the Off-Grid Solar Energy Industry

Powering Opportunity
The Economic Impact of Off-Grid Solar

EXECUTIVE SUMMARY

UKaid from the British people

altai consulting

About

GOGLA
GOGLA is the voice of the off-grid solar lighting and electrification sector. Established in 2012, GOGLA now represents over 130 members as a neutral, independent, not-for-profit industry association. Its mission is to help its members build sustainable markets, delivering quality, affordable products and services to as many households, businesses and communities as possible across the developing world. The products and solutions that GOGLA members sell transform lives. They improve health and education, create jobs and income opportunities and help consumers save money.

To find out more, go to www.gogla.org.

Altai Consulting
Altai Consulting provides strategy consulting & research services to private companies, governments and public institutions in developing countries. Altai's teams operate in over 50 developing countries in Africa, the Middle East and South Asia.

For more information please consult the Altai Consulting website: www.altaiconsulting.com

This research is supported by

UKaid from the British people

Published: July, 2018

Foreword

When GOGLA was established six years ago, its mission was to create a thriving off-grid solar market to help millions living in energy poverty access clean, affordable electricity. This mission was based on the fundamental understanding that access to energy changes lives. We presented ourselves with a significant challenge: to accelerate the speed at which we reach one of the key sustainable development goals, Access to Energy.

Since then, the notion that the private sector can deliver off-grid solar and accelerate energy access has been well proven.

Off-grid solar lighting and electrification products sold by GOGLA's 130 members have now reached over 100 million people worldwide. This success has been the result of a combined effort, from pioneering companies to forward thinking decision makers and bold investors. Yet what really propels this new market forward are the millions of customers who recognise that off grid solar can help them to save money, breathe cleaner air and light up their homes.

Yet the scale of progress is still not nearly enough. Success remains limited to too few companies in too few countries. Too many potential customers cannot yet be reached, with one billion still without access to energy. We will need to go further, faster. The call for a more targeted focus on off-grid solar must be heard louder and clearer. The success stories must be shared wider. And particularly, the evidence of the profound impact of this success needs to be shown convincingly and forcefully.

For this reason, we worked with seven pioneering industry partners to gain new insights into the transformational impact of solar kits and solar home systems. The aim of this research was to gather measurable proof of the stories these companies were hearing every day from their customers: that solar home systems are catalysing economic activity, powering businesses and improving quality of life.

'Powering Opportunity: The Economic Impact of Off-Grid Solar' highlights how a seemingly small intervention, bringing a solar system into a home, can unlock out-sized gains in welfare, productivity, and income generation. Off-grid solar has the potential to lift millions of households across Africa and Asia out of energy poverty and to open-up new economic opportunities for the next generation.

Today, our mission remains as important as it was six years ago, but what has fundamentally changed is that we now have unequivocal evidence on the impact of the off-grid solar industry. This report should be used as a meaningful force to propel us towards greater and faster action. By working together to support off-grid solar, we can power enterprise, boost well-being and bring clean energy access to all.

Koen Peters, *Executive Director, GOGLA*

© Mobisol

Executive Summary

'Powering Opportunity: The Economic Impact of Off-grid Solar' provides powerful insights into the benefits of off-grid solar power. Namely, that solar home systems (SHS) are catalysing economic activity, creating income and improving quality of life.

It is well-known that off-grid solar can deliver benefits to wellbeing and the environment, but until now, the impact of off-grid solar on economic activity, such as improved access to jobs and business opportunities, has been less clear. This research provides quantifiable evidence that, for a majority of households, solar home systems are being used to power enterprise and unlock working hours – with many reporting an immediate increase in income.

Thanks to funding from the UK's Department for International Development (DFID), researchers were able to collect and analyse data from over 2,300 new off-grid solar users in Kenya, Mozambique, Rwanda, Tanzania and Uganda. Together, these five countries represent around 45%[1] of the global off-grid SHS market. Seven leading Pay-As-You-Go (PAYG)[2] companies participated in the research, the first time such a large number of companies have joined forces to gather customer insights and impact knowledge.
The research found that nearly 60% of off-grid solar customers undertook more economic activity within just three months of purchasing a solar home system; whether gaining a new job, using their system directly within a business, or being able to work for longer.

For more than a third of customers, this access to electricity has already enabled them to increase their monthly income by $35 a month, more than half the average monthly GDP per capita[3].

In addition, over 90% of households that replaced toxic kerosene lamps with solar alternatives report that they have experienced improvements in both health and feelings of safety.

Off-grid solar is recognised as a fast and affordable alternative for scaling up energy access across the globe, delivering a wide range of improvements to quality of life. This research clearly shows that off-grid solar can also scale up economic opportunities for customers and catalyse enterprise and employment in off-grid communities.

© Mobisol

1 Based on H2 2017 sales figures collected by GOGLA
2 Pay-As-You-Go (PAYG): refers to a business model that allows users to pay for their product via consumer financing. A PAYG company will typically offer a solar product for which a customer makes a down payment, followed by regular payments for a term ranging from 6 months to 8 years. Source: Off-Grid Solar Market Trends Report 2018, Lighting Global
3 Average GDP per capital in Kenya, Mozambique, Rwanda, Tanzania and Uganda (World Bank, 2017). https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=KE-TZ-RW-UG-MZ

To create a robust data-set, interviews were undertaken with 2,343 solar home system customers.

Customers from seven companies were surveyed both at the time they purchased their system (baseline) and three months later (follow-up). Interviews took place in five countries.

Countries

- Kenya
- Mozambique
- Rwanda
- Tanzania
- Uganda

Companies

BBOXX, d.light, mobisol, solarworks!, fenix intl, ZOLA, M-KOPA SOLAR

Data showed that for a majority of households (58%), the SHS has helped unlock new economic activity.

These activities have been classified into three categories: spending more time at work, using the SHS in a business and getting a new job. 15% of households are benefitting from more than one activity.

After only three months, 36% of households already generate more income. On average, these households make an additional $35[4,5] per month.

Calculated over the lifetime of the product, additional income could exceed $2,000[6].

44% **The SHS enables a household member to spend more time at work**

24% **The SHS is used in a business or income generating activity**

7% **The SHS enabled a household member to get a new job**

4 This figure includes households combining additional incomes through more than one activity
5 All monetary amounts in this report expressed in USD unless specified otherwise
6 Expected product lifetime is computed using the warranty and a standard multiplier: Warranty * 1.5. Source: GOGLA

Solar home systems unlock additional work hours

Improved access to light and power unlocks previously unproductive hours: allowing 44% of users to be more flexible with their daily activities and spend more time at work.

Almost half of these customers have already found these extra work hours enable them to make more income: on average, an additional $25 per month.

Off-grid solar creates new job opportunities

In 7% of households the SHS had enabled a member to get a new job, with 69% of these households reporting an immediate increase in income.

On average, customers who have been able to take on a new employment make an additional $28 per month.

SHS can enhance business revenue

13% of customers use the SHS to support a business they operated prior to purchasing their system: primarily shops, stalls, bars or restaurants.

11% of customers started a new enterprise after purchasing the SHS. The most common being a phone charging business.

Overall, 24% of customers use their system to support their business, with 89% seeing this reflected in increased revenues. On average business owners generate an additional $29 per month.

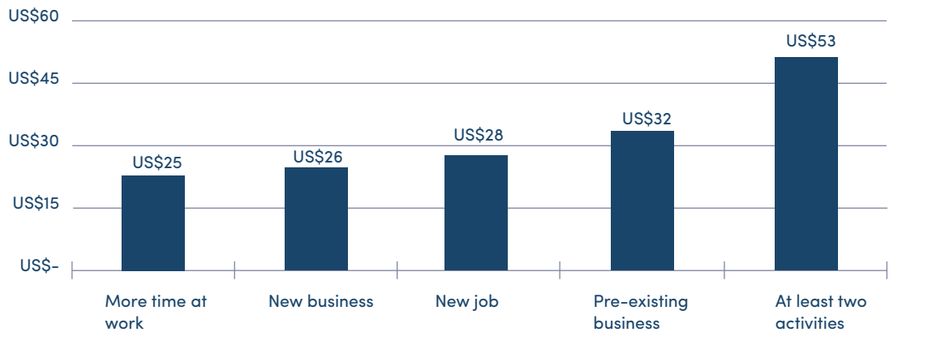
Although phone charging for a fee is the most common activity overall, the biggest returns are seen in retail shops, which increase their revenue by an average of $36 per month.

As well as uncovering the extent of economic activity enabled by the SHS across all households, results on the use of the system in existing businesses, or to start a new business, show a strong potential for use in Micro, Small and Medium Enterprises (MSME).

Customers combining two or more of these economic activities are creating the largest increase in income: on average $53 per month.

Average additional monthly income generated by type of economic activity

N (More time at work) = 359
N (New business) = 220
N (New job) = 99
N (Pre-existing) = 220
N (At least two activities) = 236



A solar lantern is the first step on the 'energy staircase', with many customers then moving to SHS.

Nearly a quarter of customers climbed further up the clean energy staircase – from a solar lantern to an SHS: indicating that, for many, lanterns are paving the way for greater levels of energy access. All customers surveyed now have mobile charging in their home, and 38% have gained access to television. 89% of customers use their phone more since purchasing the SHS, while 86% of TV owners watch it every day.

Viewed through the Sustainable Energy for All Tiers of energy access[7] 31% of households surveyed have been able to reach Tier 2.

Solar home systems have an overwhelmingly positive impact on welfare and well-being.

94% of households report that their SHS has improved their quality of life and 96% would recommend it to friends or family – testifying to their high satisfaction with their system. This improvement in quality of life is due to a number of factors, including:

Cleaner air

91% of households that previously used kerosene for lighting report their health has improved since they bought the SHS. In these households, SHS replaced an average of 1.7 kerosene lamps - reducing or eliminating the indoor pollution they generated and its detrimental consequences on health and the environment[8].

Improved safety

In addition, 91% of households feel safer since purchasing the SHS, with safety encompassing a variety of elements. For some customers it is a reduction in injuries related to kerosene burns or falling in the dark[9], while others say the light helps them to ward off thieves, attackers or wild animals at night[10].

More study-time

Lastly, additional hours of light in the home led to more study time for children. 84% of households with children report that they now have more time to do their homework.

These results highlight how off-grid solar can drive economic activity, create new business opportunities and enable households to increase their income. Data also confirms that access to off-grid solar leads to significant improvements in quality of life and welfare. The research finds that solar home systems can act as a catalyst for more resilient and sustainable economies and can further efforts to meet several UN Sustainable Development Goals.

7 SE4ALL Multi-Tier Framework approach to measuring energy access:
Tier 1: Defined either by a minimum power capacity of 3W or 12Wh or by a service of lighting of 1,000 lmhr/day with a minimum availability of 4 hours per day
Tier 2: Defined either by a minimum power capacity of 50W or 200Wh or by a service of electrical lighting, air circulation, television and phone charging are possible with a minimum availability of 4 hours per day
8 Lam, Nicholas & R Smith, Kirk & Gauthier, Alison & Bates, Michael. (2012), "Kerosene: A Review of Household Uses and their Hazards in Low- and Middle-Income Countries". Journal of toxicology and environmental health. Part B, Critical reviews. 15. 396-432. 10.1080/10937404.2012.710134.
9 Graham and Tevosyan, Perceived Health Benefits of Off-Grid Products: Results of an End-User Survey in Uganda, unpublished draft (2018), https://www.finca.org/wp-content/blogs.dir/1/files/2014/02/Perceived-Health-Benefits-of-Off-Grid-Products_White-Paper.pdf
10 See ZOLA Electric Case Study, Chapter 6

10 KEY FINDINGS

1

58% of housholds undertake more economic acitivites thanks to their solar home system

2

36%

of housholds generate additional income once they purchase an SHS

3

Housholds create an additional $35 per month on average

Amoung households generating income

4

44%

of customers can spend more time at work

As they have more light hours and time due their SHS

5

11% of customers started a new business

6

In **7%** of households, owning an SHS enabled someone to get a new job

7

89%

of customers report they use their phone more since using their SHS

8

91% of customers report they feel safer with off-grid solar

9

91% report their health has imporved since buying the SHS

Among households that used kerosene

10

84% of customers say children have more time time to their homework

© ZOLA Electric

Acknowledgments

The report was authored by Altai Consulting in conjunction with GOGLA's Research Advisor Susie Wheeldon. Altai Consulting's core team consisted of Emmanuel de Dinechin, Guillaume de Chorivit and Oliver Reynolds.

This research would not have been possible without the support of the UK Government Department for International Development (DFID).

GOGLA and Altai Consulting would also like to thank the seven off-grid solar companies that participated in this research, and the following individuals for their insights, knowledge and support:

Aggrey Alfa – ZOLA Electric
Anahit Tevosyan – FINCA International
Ancha Saide – Solarworks!
Amaury Fastenakels – BBOXX
Charlotte Webster – GOGLA
Denis Nkurunziza – BBOXX
Douglas Gavala – d.light
Erca Muzonda – Solarworks!
Iwona Bisaga – BBOXX
Jacob Lewandowski – d.light
Joan Njeri – M-KOPA
Johanna Galan – GOGLA
Julie Cammell – GOGLA
Karl Bach – M-KOPA
Koen Peters – GOGLA
Luca Giacopelli – Mobisol
Marceline Uwase – BBOXX
Michael Nique – GSMA
Michelle Haak – Miesart
Nicholas Lam – Humboldt University
Neema Nssary – Mobisol
Nyamolo Abagi – CLASP
Otilia Nhamtumbo – Solarworks!
Patrick Mengo – d.light
Paul Warnars – ZOLA Electric
Paula Berning - Mobisol
Philip Arscott – Fenix International
Roeland Menger – ZOLA Electric
Sascha Brandt - GOGLA
Sally Castillo – Mobisol
Scott Graham – FINCA
Sunny Im – Fenix International
Thomas de Wijn – Solarworks!
Wangari Murugu – M-KOPA

GOGLA

The Voice of the Off-Grid
Solar Energy Industry

Arthur van Schendelstraat 500
3511 MH Utrecht
The Netherlands

info@gogla.org
Telephone +31 304 100 914

www.gogla.org
goglassociation