Stand-Alone Solar (SAS) Enterprise Study: Follow-up

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Africa Clean Energy
Catalysing Africa's Solar Markets

TETRA TECH
International Development

UKaid
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Foreign, Commonwealth and Development Office (FCDO)
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Tetra Tech International Development

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ABBREVIATIONS AND ACRONYMS

Acronym	Definition
ACE TAF	Africa Clean Energy Technical Assistance Facility
ACM	Assistant Country Manager
AECF	Africa Enterprise Challenge Fund
AfDB	African Development Bank
CM	Country Manager
ECOWAS	Economic Community of West African States
ESMAP	Energy Sector Management Assistance Program
FCDO	Foreign Commonwealth and Development Office
GESI	Gender equality and social inclusion
IEC	International Electrotechnical Commission
IFC	International Finance Cooperation
M&E	Monitoring and evaluation
MoE	Ministry of Energy
MoF	Ministry of Finance
NGO	Non-governmental organisation
OGS	Off grid solar
PAYGO	Pay-As-You-GO
REACT-HS	Renewable Energy and Adaptation to Climate Change Technologies Household Solar
SAS	Stand-alone Solar
SEFA	Sustainable Energy Fund for Africa
SHS	Solar home system
SI	Statutory Instrument
UK	United Kingdom
UNBS	Uganda National Bureau of Standards
USD	US Dollar
VAT	Value-added tax
Wp	Watt-peak

EXECUTIVE SUMMARY

Introduction

The ACE TAF programme has a strong emphasis on increasing the affordability of high-quality stand-alone products for low-income and marginalised households by improving the policy and regulatory environment for a private sector to thrive. The 2022 Stand-alone Solar (SAS) Enterprises Study is a follow-on study to a baseline (2020) and a 2021 study. The study was commissioned as part of the annual commitment by ACE TAF to assess progress on its outcome of, *"improved policy and enabling environment to facilitate private sector innovation."* The metric used to monitor the progress was the *"improvement in perceptions of the policy and regulatory environment",* based on the responses to the ACE TAF enterprise survey. Forty-one (41) businesses participated in the 2022 study, which is a good sample for estimating the trends in the change of perception overtime. The study sought to understand the impact of quality standards compliance and selected restrictions, namely custom processes, access to finance, taxation regimes, and prices controls.

Key findings

Remarkably, 100% of enterprises interviewed reported compliance with some standards and no business was unaware of the quality standards. Except for two businesses from Zambia, all businesses indicate that there were no barriers to being standard compliant. For the two, lack of awareness was noted as the barrier. **Ultimately, quality standards compliance was viewed by the respondents to positively affect SAS businesses, and as such necessary for market growth.**

Notably, three restrictions, namely customs process (66%), access to finance (59%) and taxation (59%) were identified to negatively affect the SAS businesses. Despite differences in perception of the regulatory restrictions in the three countries, the respondents were agreeable that taxation regimes, custom processes and access to finance have negatively impacted their businesses, particularly on prices of products. Businesses noted that disparate restrictions have led to depreciation of the countries' currency and increased cost of doing business, hence leading to increased prices of SAS products.

Fiscal policy interventions such as VAT, tax and import duty exemptions are important elements for creating enabling environment to support increased access to SAS products. ACE TAF was particularly lauded both for providing the required evidence base by commissioning and implementing high-quality research, and for successfully advocating for the host governments to introduce beneficial fiscal regulations in form of tax exemptions and subsidies on SAS products. Approximately 61% of the businesses interviewed across the three countries reported that duty exemptions had a positive effect on their businesses. Noteworthy is the fact that close to one in three (32%) of the respondents did not think exemptions and/or subsidies had any effect on their businesses. Across all countries, exemptions and/or subsidies were perceived to positively affect businesses – reported by 63% respondents in Ethiopia, 55% in Nigeria and 69% in Zambia. However, 40% and 30% respectively, Nigeria and Zambia had significant proportion of respondents who did not think subsidies and/or exemptions had effect on their businesses.

The ACE TAF main changes to the policy environment over the last year were varied across the three countries. In Ethiopia, the notable changes to the enabling environment include continued depreciation of the ETB against the major currencies, limited access to forex and a 5% import duty imposed on SAS products. The only laudable change was the introduction of PVOC influenced by ACE TAF, which raised the businesses' optimism. T**he FOREX issue was not only reported as a problem in Ethiopia – it was mentioned as one of the challenges in Nigeria as well.** Other changes in Nigeria included the mandatory requirement by businesses to comply with e-waste regulations, and the imperative for the health clinics to be energized with solar power, particularly with the adoption of the Lagos State Electricity Policy. Changes in Zambia included new statutory regulations and duty exemptions. **The Zambian enterprises indicated that clarity around lithium batteries tax regime still remains a challenge** that the Zambian Government is yet to resolve.

The proportion of businesses reporting unfavourable policy and regulatory environment shows an irregular trajectory between March 2020 and March/April 2022. In 2022, the proportion of businesses reporting unfavourable environment significantly reduced to a favourable low of 16.9% - lower than any of the two previous periods. A trend analysis of the proportion of businesses reporting favourable policy and regulatory environment shows a positive trajectory from March 2020 to March/April 2022. The country-by-country analysis shows systematic improvement across all the three countries.

Businesses reported the main challenges in the SAS market, and reasons for the challenges include the availability of capital, lack of FOREX in some countries, lack of technicians to repair and maintain the SAS products, and limited awareness on SAS products. A large number of unbanked customers especially in the rural areas, insecurity, existence of fake solar products, environmental safety concerns, infrastructural changes in rural areas, and lack of incentives to encourage adoption of OGS products in rural areas was also mentioned.

Conclusions and Lessons

The study suggests that there has been improvement in the policy and regulatory environment for SAS businesses between the baseline study (2020) and 2022. And **the majority of the businesses (61%) believe that there has been improvement in the policy and regulatory environment in 2022 compared to 11% in 2021.** And in fact, across all the countries, there was a reduction in the number of those who believed the situation has worsened. The proportion who believes that the situation has worsened reduced from 33% in 2021 to only 7%. In Nigeria, for example, those who believed the situation has worsened dropped from 10% in 2021 to 5% in 2022 with a corresponding increase in the proportion who believe that the situation has improved from 20% in 2021 to 55% in 2022. Similar trajectory was witnessed in both Ethiopia and Zambia.

While the observable improvement may not be entirely attributable to the ACE TAF interventions, anecdotal evidence from the study suggests that they had a bearing on the current business environment. Some of the interventions favourably mentioned by the businesses include PVOC in Ethiopia, strengthening the regulatory instruments in both Zambia and Nigeria, as well as capacity building of regulatory institutions and work on quality standards across all the three countries.

Insights and Recommendations

Substandard products are still seen as a detriment to the market. Results suggest that the **majority of the businesses have a positive attitude towards adoption of quality standards.** What is required is proper messaging as well consistent and deliberate enforcement by the standards authority for compliance.

In addition to having better standards there is need for governments to consider more equitable financing incentives and policies to reduce cost of products for consumers and the cost of doing business for companies. Such regulations could include subsidies, VAT and tax exemptions and access to finance as well as putting in place the necessary infrastructure. Care should be taken by governments to ensure that duty exemptions are encompassing for all SHS components as possible. Governments should also introduce suppliers' credit in countries where FOREX remains a challenge to ease this challenge.

There is need for consistency in the enforcement of the regulations. Some businesses felt that governments were inconsistent and selective in the implementation of the regulation. Governments should work to reduce duplication of compliance requirement in the sector by harmonising all these into one point of regulation.

1. INTRODUCTION

1.1 Background of ACE TAF

The Africa Clean Energy (ACE) Technical Assistance Facility (TAF) is 4-year programme funded by the UK Government Foreign Commonwealth and Development Office (FCDO) and implemented by Tetra Tech International Development. The programme aims to catalyse a market-based approach to private sector delivery of renewable energy electrification technologies, with a focus on high-quality stand-alone solar (SAS) systems. Ultimately, the goal is to improve access to modern energy services across Sub-Saharan Africa. The programme is part of the broader partnership consisting of the International Finance Corporation (IFC) Lighting Global Programme's workstream to implement stand-alone solar quality standards in five countries; the Africa Enterprise Challenge Fund (AECF) Renewable Energy and Adaptation to Climate Change Technologies Household Solar (REACT-HS), which funds off-grid energy companies in up to nine African countries; and two components implemented by Energy Sector Management Assistance Programme (ESMAP) and the African Development Bank's (AfDB) Sustainable Energy Fund for Africa (SEFA) – a fund working to help transform the emerging green mini-grids sector.

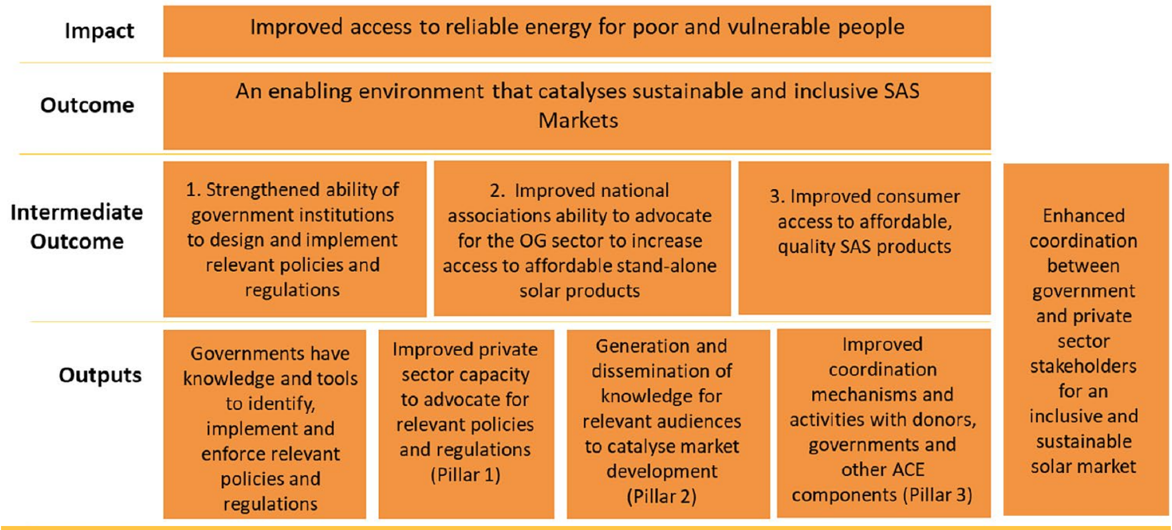
The ACE TAF programme was designed to be implemented in 14 African countries, namely Ethiopia, Ghana, Kenya, Malawi, Mozambique, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, Tanzania, Uganda, Zambia and Zimbabwe. However, the scope reduced in March 2021 to continue in three countries: Ethiopia, Nigeria, and Zambia.

The ACE TAF programme has a strong emphasis on increasing the affordability of high-quality stand-alone products for low-income and marginalised households by improving the policy and regulatory environment for a private sector to thrive. It does this by complementing government, private sector, and donor initiatives to overcome many of the barriers preventing the development of markets of high-quality SAS systems.

1.2 ACE TAF Theory of Change and Programme Context

As depicted in the ACE TAF Theory of Change, the programme aims to achieve improved access to clean, reliable energy, leading to better well-being and livelihood opportunities for poor people across Africa. The programme theorizes that realizing access to clean and reliable energy is dependent on increased private sector investment, which itself is influenced by improved policies and an enabling environment that facilitates private sector innovation. The programme believes that a competitive market environment results from businesses accessing finance and technical assistance; governments being equipped with knowledge and tools to identify, implement and enforce relevant policies and regulations; governments implementing improved quality assurance and consumer protection regulation from household solar products; and businesses in the off-grid sector receiving clarity on policy impacting the business and market development and knowledge sharing support. Towards this end, the programme invests in interventions that promote improved policies and regulations, support market expansion for high-quality SAS systems, advocate for adoption of international quality standards for SAS products, improve access to knowledge and evidence and support off-grid sub-sector coordination.

Figure 1: ACE TAF's Revised Theory of Change



The ACE TAF programme targets stakeholders within the off-grid solar (OGS) sub-sector including the Ministry of Energy and other government relevant government agencies, industry associations, standard bureaus, industry regulators, donors, non-governmental organisations (NGOs), and other ministries and organisations responding to SDG 7 imperatives and private sector institutions. Specifically, the ACE TAF programme aims to provide technical assistance to country governments and stakeholders so as to lead to improvements in the wider enabling environment for Solar Home Systems (SHS). ACE TAF thus implements a suite of interventions aimed at policy and regulatory change. The focus of ACE TAF's work that addresses policy and regulatory change looks mainly at fiscal barriers and quality standards.

2. METHODOLOGY

2.1 Purpose of the study

The April 2022 follow-on SAS Enterprise Study is part of the recurrent annual studies aimed at tracking changes in business perceptions of policy and regulatory environment in ACE TAF counties. This is a follow-on study to a baseline study completed in 2020 and a second study in 2021. The study is part of the ACE TAF monitoring, evaluation and learning framework to assess changes in business perceptions of policy and regulatory environment across the SAS sector, particularly the regulations on fiscal policies and quality standards – where ACE TAF has been facilitating discussions and showing results through regulatory and policy change and adoption. The purpose of the study is to assess the extent of progress in the outcome, “improved policy and enabling environment to facilitate private sector innovation”, over time. Contributing to this outcome are two indicators monitored by ACE TAF:

1) Improvement in perceptions of the policy and regulatory environment, based on the ACE TAF firm survey, and
2) The proportion of ACE TAF recommended policies and/or regulations to support OGS development that are approved by governments.

The survey measures the former indicator.

2.2 Approach and Objective

The 2022 SAS Enterprise Study builds on the findings from the past studies. While the 2020 (baseline) and 2021 studies targeted all the initial 14 ACE countries, the 2022 study focused only on 3 countries, Ethiopia, Nigeria and Zambia. In addition, while the baseline study approach differed from the follow-on study in 2021, the current study is similar in approach and purpose to the 2021 follow-on, albeit with a reduced geographical scope. While the baseline survey had a specific focus on assessing the proportion of businesses operating more efficiently, the two follow-on studies have primarily been adapted to better understand the business perception of the policy and regulatory environment. Consequently, the survey questions were revised to elicit responses that would better measure the perceptions of the businesses of the policy and regulatory environment. Both follow-on studies have been conducted in-house by TetraTech, the ACE TAF implementing organization, hence utilising the internal resources to increase time- and resource-efficiency.

Just like in 2021, the current SAS Enterprises Study responds to the following objectives:

- To understand business perception of the regulatory and policy environment of ACE TAF’s target countries.
- To understand the extent to which businesses’ perceptions of the policy and regulatory environment have changed over time since 2020.
- To understand ACE TAF’s contribution to the policy and regulatory environment from baseline to date.
- To document lessons learnt and best practices that can be replicated in ACE TAF and other business environment reform programmes.

2.3 Study Design

The study is based on concurrent mixed-methods research design in which qualitative and quantitative data were gathered and analysed at the same time. Accordingly, the study was designed so that the same respondents provided both qualitative and quantitative data. This approach allowed the team to triangulate data sources and increase accuracy and robustness of the findings. The questions were specifically designed to help explore the extent to which businesses' perception of policy and regulatory environment has changed, and the relevant contextual factors within, and outside the control of businesses that have influenced their perception.

The research tool (attached in the annex) included questions on specific themes of interest; namely: business product, target market, sales, quality standards, fiscal regulations and business perceptions of policy and regulatory environment. Each theme-specific set of closed-ended (quantitative) questions in the study instrument was followed by at least one open-ended (qualitative) question and unlimited comment field, linked to the question set immediately following it. The study aimed to go beyond the quantitative data to understand the mechanisms at play and an appreciation of how and why certain trends were observed.

2.4 Research Questions and Interview Tool

The current study questionnaire is largely a replica of the April 2021. Except for the time sensitive questions, all other items remained the same with questions reflecting the new reporting period as of March/April 2022. The questions once more focused on establishing the businesses' perceptions of the policy and regulatory environment. The complete set of question may be found in the annex.

In general, the interview questions were categorized as follows in order to obtain relevant responses.

a) How do enterprises perceive the policy and regulatory environment, specifically in relation to fiscal and quality standards regulation, in their country?

b) To what extent have business perceptions of the policy and regulatory environment changed over time since 2020?

c) What is ACE TAF's contribution to the policy and regulatory environment, in ACE target countries, from baseline to date?

d) What lessons and best practices are emerging that can be replicated in ACE TAF and other business environment reform programmes?

2.5 Sampling approach

Both baseline and the subsequent follow-on studies utilised purposive and snowballing sampling methods in identifying businesses which participated in the study. The process to identify businesses involved reaching out to those in the programme database from the previous two studies, reaching out to industry associations as well as referral by the businesses which participated in the study. Although the aim was to include, at least 10 businesses in all ACE TAF countries, this did not materialise across the three studies conducted.

Despite the team's efforts to interview 10 businesses from Ethiopia, it was only possible to complete interviews with eight respondents. This could be explained by the nascent nature of the SAS sector in Ethiopia, which resulted in a smaller pool of potential respondents. Whereas Ethiopia had 8 respondents, Nigeria and Zambia had 20 and 13 respondents respectively. To an extent, the uneven number of respondents across the three countries affects our ability to make comparisons between countries. However, the consistency in the number of respondents across the three study periods makes it possible to demonstrate progressive change in perception due to ACE TAF's interventions. Similarly, the aggregates from the three countries, provide reasonable anecdotal evidence of the positive trajectory as mediated by ACE TAF. Overall, 41 businesses participated in the 2022 study, which is a good sample for estimating the trends in the change of perception overtime (both positive and negative).

Although the aim was to include the same respondents who participated in the 2021 survey across all three countries, this was not possible to achieve in all cases as some respondents were not reachable, responsive, or available to speak. Like results in the second study in 2021, a small number of business closures were reported. In Nigeria 100% of the businesses which participated in the 2021 were available for the 2022 follow-on study. For Ethiopia and Zambia, however, 63% and 50% of the respondents respectively participated in the two follow-on studies (2021 and 2022). However, despite the fluctuation in the number of the same companies surveyed and the total across all counties we were able to draw trend conclusions.

2.6 Training and Data Collection

A refresher training was conducted prior to data collection as part of the study preparation. This was done with the objective to raise an appreciation by the data collectors, who were mainly Assistant Country Managers (ACMs), the need for high-quality data. The training also ensured better understanding of the study tool for seamless administration to the businesses. The training areas included the purpose and structure of the study, a walkthrough the research tool in detail, and sharing of practical tips on how to carry out remote interviews.

Data collection was commissioned immediately after the training. All the interviews were carried out by ACMs based in the ACE countries, with the Country Managers (CMs) and the M&E Manager stepping in as need basis to provide guidance and technical support to carry out interviews. All the three ACMs were involved in data collection. Microsoft (MS) Forms was utilized as the most preferred online data collection tool mediated by the ACMs. MS Forms was preferred for this study because of its ability to allow for the creation of fillable forms quickly, collect responses in real-time, and visualize data using automatic charts.

Additionally, there were regular check-ins with the ACMs and one-to-one support and follow-up for each country team. These regular check-ins allowed the teams to share questions, feedback, and challenges during the data collection process. This was an iterative process in which the M&E Manager would provide further guidance and tweak the businesses mobilisation strategy based on emerging feedback received from country teams. Zambia, for instance, initially had a challenge in raising respondents to the study but through this approach, the country team managed 13 businesses, 3 more above the threshold of 10 earlier targeted. It is only Ethiopia that did not meet the required number of respondents but still had a representative sample being the same number of businesses as was in April 2021.

2.7 Data Processing and Analysis

This phase of the study was conducted by the ACE TAF M&E Manager. Being a mixed-methods study, the process involved analysing both quantitative and qualitative data generated from the survey. The responses to the qualitative open-ended questions was reviewed and leveraged to explain the contextual factors driving the differences in perception.. A reflection meeting was then organised with the broader ACE TAF team to understand the nuances behind the qualitative and quantitative data as recorded, as well as to maximise the learning opportunity that the study afforded the programme.

Since the tool had been rendered in MS Forms, the analysis was in two phases. First, through the in-built data analytic capabilities in MS Forms. This was only possible for selected variables. The second phase of the analysis, however, involved importing the raw excel data set into the Stata data analysis software where the quantitative data was cleaned and analysed. The analysis was mainly based on descriptive statistics, specifically mean, frequencies and proportions.

The analysis involved reading of the qualitative data and discovering significant groupings and the generation of categories based on the responses from the businesses. This followed a process of identifying themes and patterns, interpreting of the emerging understanding of issues and a search for alternative explanations including divergent views; which helped in the identification and explanation of key issues which are likely to bear on the quantitative findings.

2.8 Study Limitations and Mitigation Strategies

In the review period (April 2021 to March/April 2022), there was staffing and programmatic changes taking place in the ACE TAF programme. The scope of the programme was reduced and staff working on previous studies were no longer with the programme. Despite all these changes, the study was completed, and the results present a good pointer to the progress made by ACE TAF policy interventions.

There were also limitations due to Covid-19 restrictions. To mitigate this challenge, data was collected using an online-based platform and interviews with the respondents were administered by Assistant Country Managers (ACM), mostly through video and phone calls. However, the on-line remote nature of the survey, comes with its own challenges, including:

- Problems with connectivity and limited telephone or internet coverage, poses the risk of lowering the quality of calls and could cause loss of rapport, which could potentially affect the depth and quality of data gathered.
- Absence of visual or nonverbal cues, inability to observe behaviour and body language, with the risk of telephone interviews becoming mechanical and cold.
- Having little opportunity to establish rapport with respondents and having potentially shorter times for interviews as respondents may more easily become fatigued by telephone compared to face-to-face interaction.
- Limited engagement, low response rates and little interest in participating in research, potentially limiting the breadth and depth of our findings; and
- Little scope for additional informal exchanges, which can be a rich source of data.
- These challenges were mitigated in several ways:
- Preferring video interviews whenever possible to limit the lack of nonverbal cues and to help establish rapport with respondents.
- Preparatory engagement with the potential respondents. The ACMs had several email exchanges prior to interviews to create an initial connection and rapport with participants.
- Clearly defining the objectives and areas to be covered in the interviews. This included sharing if the topic guides prior to the scheduled calls and clearly setting expectations in terms of call length. Any data that could be filled before the interviews were captured to shorten the contact time with the respondents, hence improving the response rate.

By implementing these measures, the team was able to collect data at a sufficient level of quality for the purposes of the study.

The only other limitation was the fact that the study relied on self-reported data from businesses, which may not be independently verified. Coupled with the small sample size, this means that the study cannot be generalised beyond businesses interviewed. The study should therefore be interpreted as a reflection of the businesses experiences and perceptions, rather than an accurate representation of the entire SAS sector in the three ACE TAF countries.

3. RESULTS AND FINDINGS

This section presents descriptive characteristics of the businesses sampled as well as key findings around business perceptions of the impact of quality standards and selected restrictions, business perceptions of the impact of fiscal regulations, business perceptions of the current regulatory environment, the perception on policy improvement between March 2020 to March 2022, and the effect of COVID 19 on business.

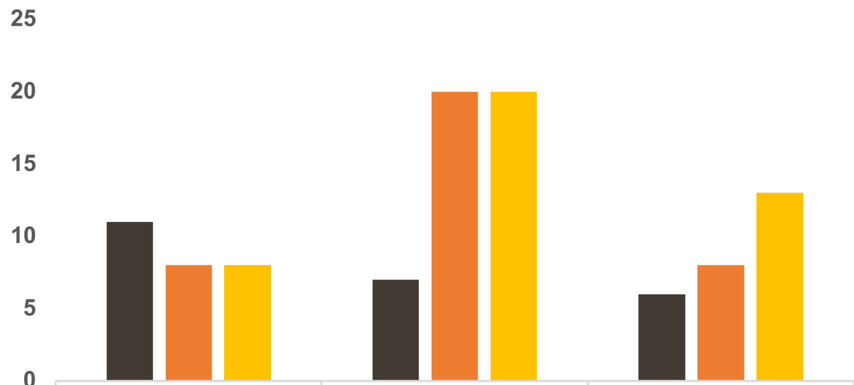
3.1 Descriptive characteristics of sampled businesses

The section explores descriptive characteristics of the businesses sampled including an overview on the number of respondents, business ownership, size of stand-alone solar products, preferred distribution models, target markets and the level of compliance with quality standards.

3.1.1 Number of businesses interviewed by country

Unlike the study completed in April 2021 whereby businesses from all ACE TAF 14 active countries were considered, in April 2022 businesses from Ethiopia, Nigeria and Zambia were eligible. This reduced the number of businesses to 41 down from 100 businesses in April 2021, however, almost double the number interviewed at baseline (24). As shown in Figure 3, out of the 41 respondents interviewed, 8 were from Ethiopia, 13 from Zambia and 20 from Nigeria. Only Ethiopia did not meet the targeted threshold of 10 businesses.

Figure 2: Number of respondents interviewed by county and year of study



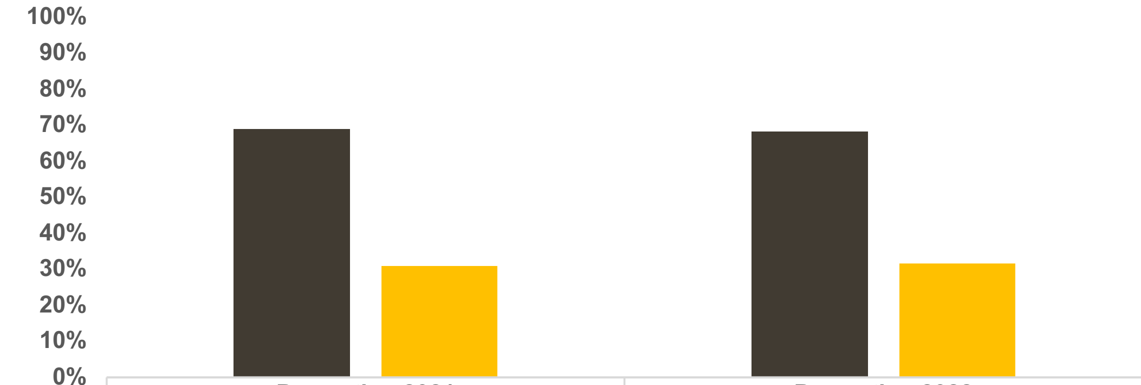
	Ethiopia	Nigeria	Zambia
No.interviewed at baseline	11	7	6
No.interviewed April 2021	8	20	8
No.interviewed April 2022	8	20	13

No.interviewed at baseline   No.interviewed April 2021   No.interviewed April 2022

3.1.2 Business ownership by gender

This was explored as part of ACE TAF's commitment to gender equity and social inclusion (GESI) principles. Being that the programme focuses on improving access to clean, reliable energy, particularly for women, understanding the level of participation of women in the SAS sub-sector is important. As shown in Figure 4, 32% of the businesses interviewed in March/April 2022 were female-led, a 1% increase from 31% in March 2021. However, men are still the majority in terms of SAS business leadership at 68% and the solar sector remains male dominated.

Figure 3: Business ownership disaggregated by gender and year of study

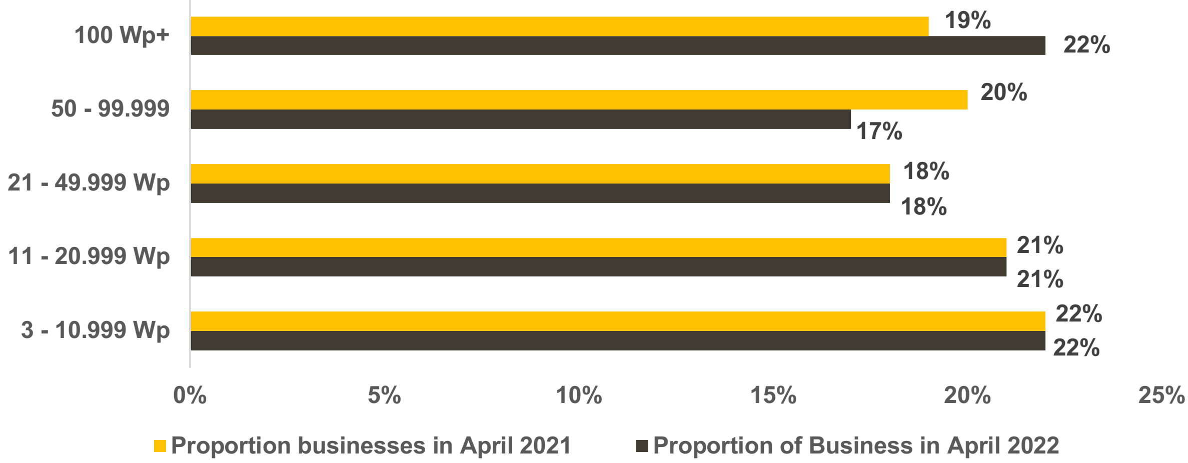


	Proportion 2021	Proportion 2022
Male	69%	68%
Female	31%	32%

3.1.3 Size of stand-alone solar (SAS) solutions

The size of stand-alone solar solutions sold by a business is a proxy indicator of market maturity. Market observers in the off-grid sector report that consumer demand for larger capacity systems increase[1] , including higher wattage solar solutions for productive use, as the market matures. Businesses were asked to select from a list of five categories the size of the stand-alone solutions that they were offering. As shown in Figure 5, the offerings were not significantly different between April 2021 and March/April 2022. Just like in 2021, the current 2022 study shows that 22% of businesses sold 3 – 10.999Wp (the smallest category). However, we saw a slight increase in the number of businesses selling the largest system sizes in 2022. The current study seems to confirm the observation in 2021 study that there is increasing popularity of the larger solutions, which once again may be explained by rising interest in the productive use of energy. This has been anecdotally supported by qualitative data from the respondents. Unlike in 2021 where the most unpopular size category with businesses was the 21 – 49.999Wp, in the current study the most unpopular size category is 50 – 99.999 with 17% reporting to be selling this size category. Although there is progress in the uptake of SAS products, there is still significant opportunity for growth in the three countries considered in the study.

Figure 4: Size of SAS solutions disaggregated by year of study3.1.3 Size of stand-alone solar (SAS) solutions



1 *Baseline Solar Home Systems Enterprises Survey Report (January 2021, p36)*

Businesses were asked to report on any changes in their product offerings to further understand the changing business environment. Anecdotes from this exploration indicate that, for most respondents across the three countries, businesses were constantly evaluating their offerings including product sizes to respond to the changing market demands.

Although there are cases where restructuring of offerings involved reducing product sizes, in Nigeria most businesses moved from selling smaller sizes to bigger ones.

"Now we focus on bigger systems 400W and above."

"We increased system sizing to reach more customers."

"We added products with sizes of more than 350W."

Similar trends were also witnessed in Zambia where change from smaller to bigger products was also reported.

"We have started selling some larger home systems and are currently importing more productive use solar such as solar sewing machines and PA systems."

"The business is offering larger solar systems with 50Ah and 100Ah batteries, which come with 120W PV. The motivation behind this change was demand in the market."

In Zambia the increasing demand for larger SAS products could be resulting from the rising appetite for productive use SAS products.

3.1.4 Distribution model

A product distribution model defines the approach the business choses to take to move product from manufacturer to the end customer. The commonly used distribution models are selling through distribution businesses or retailers, and direct sales to the end user. The study sought to understand which of these models was most preferred by the sampled businesses. Accordingly, Figure 6 shows that the majority of the businesses interviewed, 60% reported to combine these models sold directly to end users and through retailers. Few businesses sampled (14%) used a business to business model selling to retailers.

Figure 5: Sales distribution models

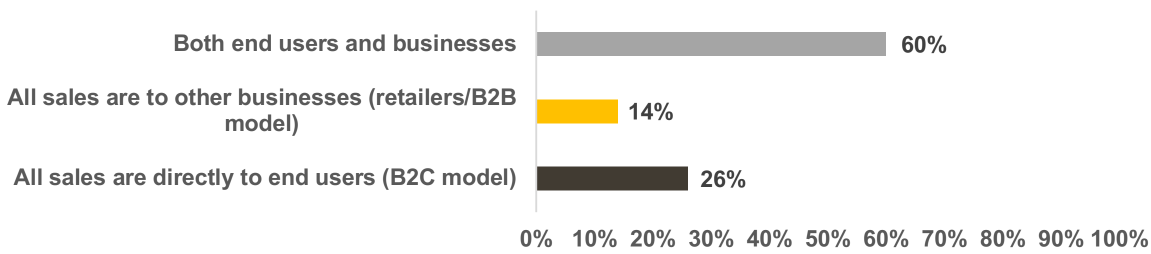
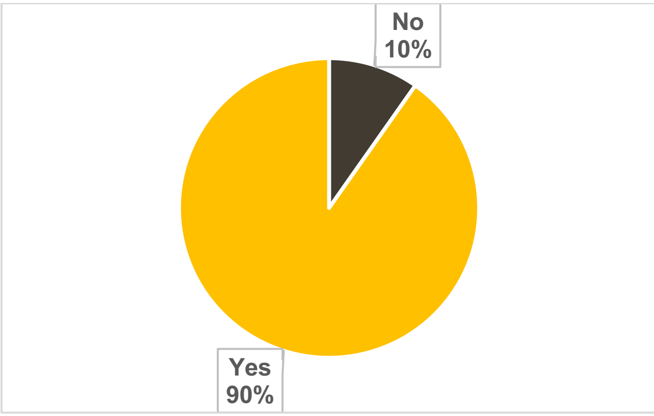


Figure 6: Proportion of business with focus on marginalised

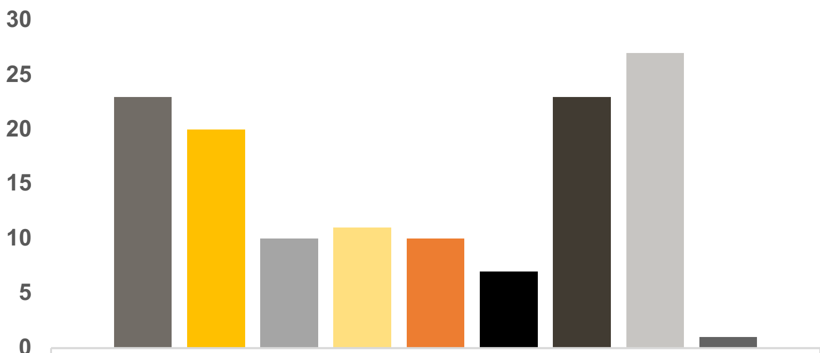


3.1.5 Target market

At the core of ACE TAF is the aspiration to ensure poor people of Africa have access to clean, reliable energy, leading to better well-being and livelihood opportunities. The programme has a particular emphasis on vulnerable and rural communities and marginalized groups including women, youth and persons with disabilities. It is against this background that the study sought to identify the category of people that the sampled SAS businesses targeted with their product offerings. Figure 7 shows that, most of the sampled businesses (90%) had a focus on the marginalised groups. Only 10% of the businesses interviewed had no particular focus on the marginalised.

As shown in Figure 8, an examination of the categories of the marginalised groups targeted by the businesses revealed that overall, majority focused on last-mile customers followed by those that target women and households identified as marginalised. Further, some businesses reported to be reaching other marginalised categories including smallholder farmers, low-income households, youth, internally displaced persons, people with disabilities, refugees, and nomadic communities.

Figure 7: Marginalised groups targeted by businesses



	Frequency
Women	23
Youth	20
People with disabilities (PWDs)	10
Internally displaced persons	11
Refugees	10
Nomadic communities	7
Marginalised households	23
Last-mile customers	27
Other	1

When asked to indicate the challenges the businesses in reaching out to the marginalised groups, the respondents listed several challenges, ranging from poor infrastructure to logistical, socio-cultural and economic issues, lack of access to capital, insecurity, and topographical challenges. Some of the challenges are included in Box 1.

Box 1: Challenges faced by businesses in reaching the marginalised groups

"Transport is a challenge due to lack of road access to remote areas." (Respondent, Ethiopia)

"Social cultural issues: We have to deal with norms/peculiarities in the different communities, tribes, traditions, geo-political zones. Economic challenges: These demographics are the poorest (poverty prone) who live below the poverty line and are not able to afford the products. Logistics issues: Most of their locations are hard-to-reach areas, as we have to use various modes of transportation to access the communities." (Respondent, Nigeria)

"Difficulties in accessing scale-up capital, which in turn limits the capacity to deliver to remote rural parts of the country. The country has a very low density, and this makes it even more costly to reach the last mile customers." (Respondent, Zambia)

"These marginalised groups are located in remote areas, with difficult road access and with no banking services. Whatever we sell, we have to carry the cash with us because of lack of banking services, which is very risky. Communication is also difficult because of mobile network coverage in the areas." (Respondent, Ethiopia)

"The challenges in reaching rural off-grid customers is much e.g. insecurity, access to road network, means of communication in some areas etc. (Nigeria)

To mitigate these challenges, businesses use among other strategies, lobbying the government through their association for favourable business environment; expanding the number of client financial service providers to increase access to forex; equipping staff with high-quality communication gadgets; setup mobile money agents in communities where they do not exist; create awareness on the benefits of SAS products; build partnerships with other organisations; employ innovative distribution models; employing agents to collect payments; seeking alternative finance sources through grant writing; hiring local agents to sell; and partnering with fintech companies to help take care of rural customers. Selected strategies as reported by businesses are included in Box.

Box 2: Efforts made by businesses to reach the marginalised target groups

"We are lobbying the government through our association – Ethiopia Solar Energy Development Association – to develop a regulation that will fairly assign the role and responsibilities of each player in the supply chain." (Respondent, Ethiopia)

"Expanding the number of our client banks to increase access to forex and hence the supply of SAS products to the marginalized target groups." (Respondent, Ethiopia)

"We equip staff with high-quality phone with good picture quality, take geo-coordinates of customer installation points, take photos to identify customers and their location, get alternative contacts, and unload them to the customer database/application." (Respondent, Nigeria)

"Through our last mile distribution model, which focuses on direct sales, allowing our field teams to own the sales and onboarding process. We conduct a door-to-door approach where clients can make an informed decision in the comfort of their house. We also empower local people by recruiting them as sales agents to distribute the products in their respective areas. (Respondent, Zambia)

"Employment of agents for collecting payments with ease; partnership with telecoms and fintech companies to widen reach for payment collection as well as frequent engagement and awareness campaigns with communities." (Respondent, Nigeria)

"Last mile distribution to remote locations include working with women groups and school leavers." (Respondent, Zambia)

Alongside these mitigation strategies, businesses have also responded by redesigning their sales model and/or changing their target markets. In Nigeria, for instance, a respondents indicated the following:

"Previously, we only did Energy As A Service (EAAS) models, but in the last year, we began piloting lease-to-own and cash-models to test the market for any major changes in consumer preferences, and enhance business agility." (Respondent, Nigeria)

"No but expanding to youths in the near future." (Respondent, Nigeria)

"We added SMEs for PUEs sales to increase reach to more customers." (Respondent, Nigeria)

"Looking into energizing healthcare and agriculture sectors." (Respondent, Nigeria)

Similar trend was also witnessed in Ethiopia and Zambia. In Ethiopia, a respondent noted,

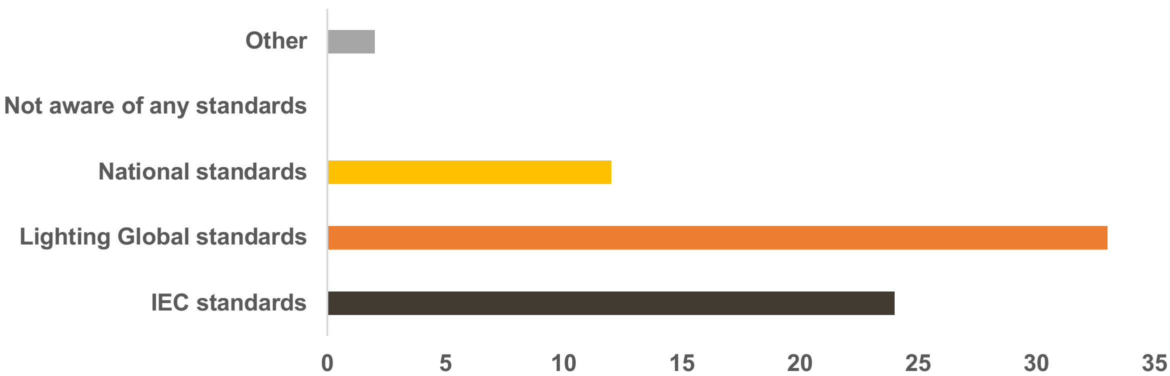
"We have included refugees as our target market last year." (Respondent, Ethiopia)

3.1.6 Compliance with quality standards

ACE TAF is part of the broader ACE Business Programme consisting of the International Finance Corporation (IFC) Lighting Global Programme standards quality work stream. In collaboration with IFC and their partner CLASP, ACE TAF is building the capacity of governments and standard agencies, providing with tools to adopt and enforce quality standards. This includes adoption of quality standards, pre-export verification of conformity to standards (PVOC) processes and improving the importation processes for household and productive use products. Since inception, ACE TAF has continued to advocate for the adoption of International Electrotechnical Commission (IEC) standards 62257-9-5 (test methods) and IEC 62257-9-8 (quality standards). ACE TAF believes that ensuring that only quality assured products are made available to consumers enhances the credibility of the technology, reduces the affordability gap for vulnerable households and increases the contribution of SAS products to national electrification targets.

The businesses were asked to indicate whether their products were compliant with any known quality standards, particularly IEC, Lighting Global and country-specific standards. Impressively, 100% of the businesses interviewed reported to be compliant with some standards and no business was unaware of quality standards. As shown in Figure 9, most of the businesses reported being compliant with Lighting Global standards, followed by IEC and national standards. Standards Organisation of Nigeria Conformity Assessment Programme (SONCAP) certification was mentioned as the only other standard that some businesses comply with.

Figure 8: Compliance with quality standards



	IEC standards	Lighting Global standards	National standards	Not aware of any standards	Other
Series1	24	33	12	0	2

Except for two businesses from Zambia, all businesses indicate that there were no barriers to achieving compliance. For the two, lack of awareness was noted as the barrier. The businesses were not aware that these certifications could be done locally.

Asked to indicate whether there were any changes to the national standards for SAS products, the businesses, particularly those from Nigeria and Zambia, mentioned a few changes to the quality standards framework. For Nigeria the notable change was with regards to SHS quality standards with SON. In Zambia the new Statutory Instrument (SI) was mentioned to be of significance and the expectation was that the changes to the national standards would reduce the number of counterfeit products on the market – a positive step that was welcomed by businesses. In Zambia, the standards for solar home systems are in the process of being declared mandatory to improve product quality.

3.2 Key Findings

The study was designed as an annual monitoring exercise to assess changes in business perceptions of policy and regulatory environment across the SAS sector. The report includes findings based on analysis of responses to understand the following.

1) Business perceptions of the impact of quality standards and selected restrictions.
2) Business perceptions of the impact of fiscal regulations.
3) Business perceptions of the current regulatory environment.
4) Perception on policy improvement between March 2020 and April 2021 and
5) Effects of Covid-19 on businesses.

3.2.1 Business perceptions of the impact of quality standards and selected restrictions

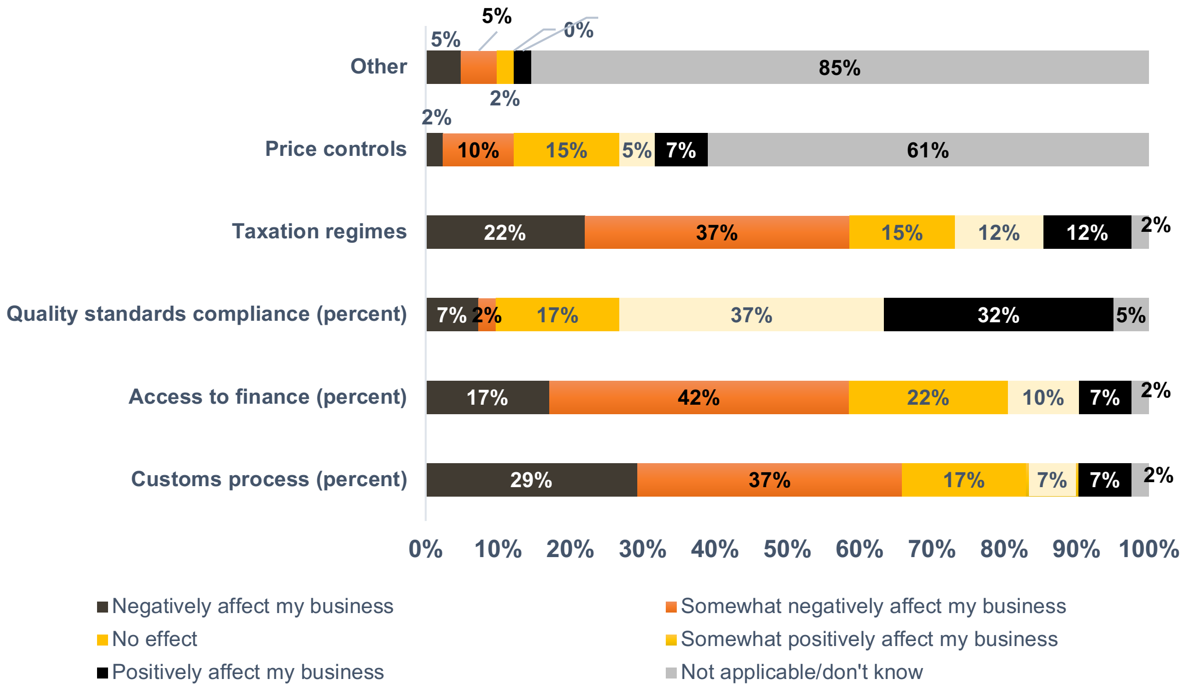
To support the quality standards adoption, ACE TAF partnering with IFC as a technical advisor, developed importation guides which help to enforce the quality standards and streamlines the importation processes for companies that distribute product that meet IEC standards. The guides identify tax incentives for standalone solar products and these incentives are tied to only high-quality products. The ultimate intent is to reduce the number of poor-quality products reaching the market and improving consumers' confidence and hence market growth. The study sought to understand the extent to which quality standard interventions and other restrictions such as unclear customs process, access to finance, quality standards compliance, changing taxation regimes and price controls affected businesses in ACE TAF countries in the 2021-2022 period.

Overall, **quality standards compliance was viewed by the respondents to positively affect SAS businesses, and as such supportive to the market.** As shown in Figure 10 for instance, 69% of the businesses interviewed indicated that quality standards either somewhat positively or positively affect their businesses. This was followed by restrictions such as taxation regimes at 24%, access to finance at 17%, customs process at 14% and price controls at 12% in that order. 17% of the respondents, however, believe that quality standard restrictions had no effect on their businesses, whether positive or negative. Notably, three restrictions, namely customs process (66%), access to finance (59%) and taxation regimes (59%) were identified to negatively affect the SAS businesses. This is similar to the findings in the April 2021 study. Only nine percent of the respondents think that compliance to quality standards has negative implications on their businesses. These results suggest that **majority of the businesses have a positive attitude towards adoption of quality standards.** They only need proper messaging and thereafter enforcement by the standards authority for compliance.

Other than the set of restrictions explored, businesses also mentioned additional restrictions being imposed on businesses such as restriction on forex for importation, and restrictions on access to financing available for OGS companies in Nigeria and taxation of lithium batteries in Zambia. The businesses had the following to say about these restrictions:

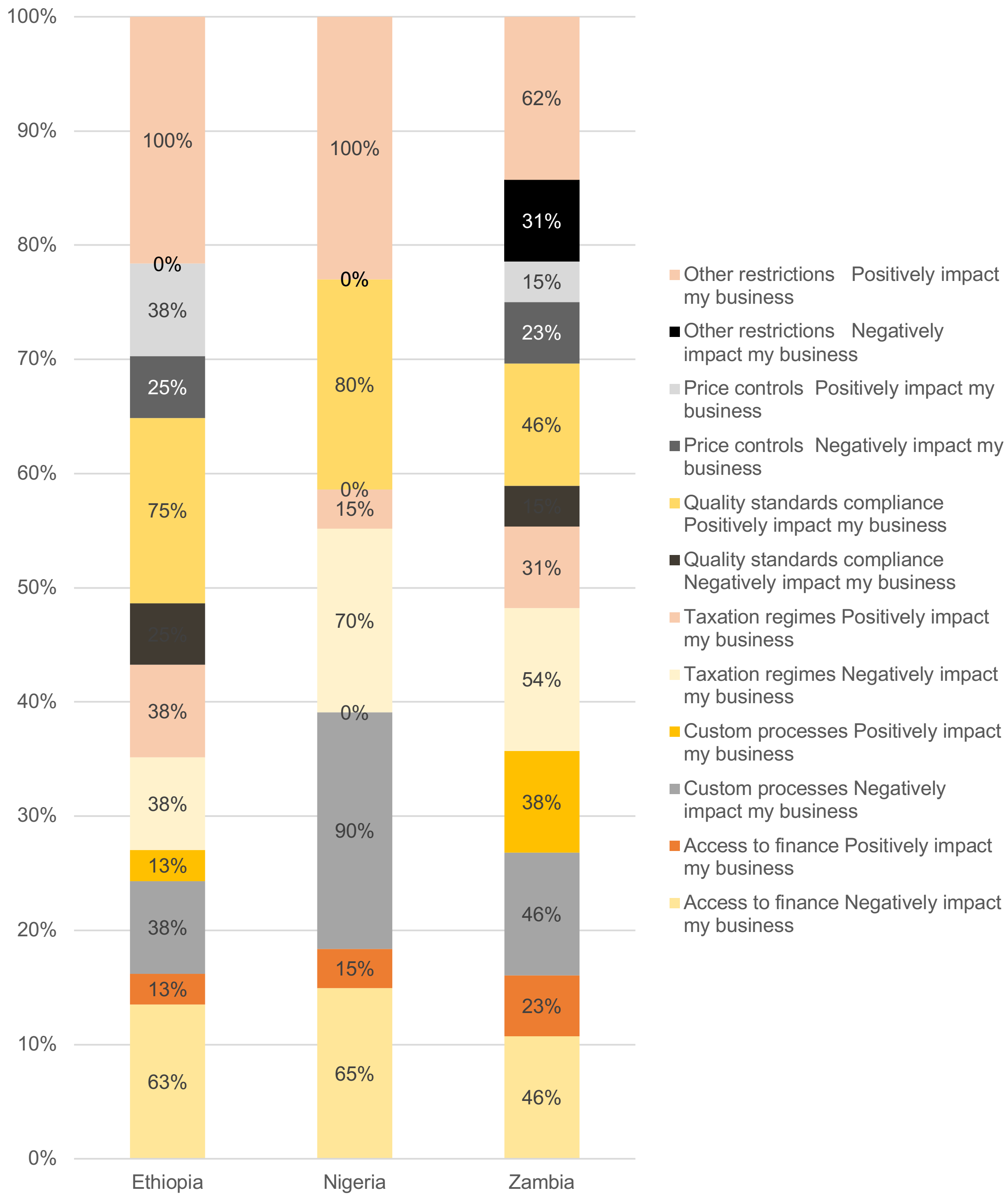
> **"Forex for importation: There is a restriction as on the amount of FX an individual/ business can access per time. Companies need to able to access dollars in order to import SAS products into the country. We can't purchase products from overseas with Naira." (Respondent, Nigeria)**
>
> **"There was a CBN finance available for OGS companies, but not permissible for foreign owned companies, like mine." (Respondent, Nigeria)**
>
> **"All solar products have zero duty and VAT. However, erroneously government forgot to remove VAT on Lithium batteries." (Respondent, Zambia)**

Figure 9: Impact of quality standards compliance and other restrictions on businesses



The impact of regulatory restrictions varied across the three ACE TAF countries. Even where countries agreed to the direction of the impact, the magnitude would be different as shown in Figure 11. Although quality standards compliance was generally reported to have a positive impact on businesses in Ethiopia (75%) and Nigeria (80%), in Zambia, only 46% of the respondents reported that it positively impacted their businesses. Variations were also seen across the other regulatory restrictions, namely taxation regimes, custom processes, access to finance, and price controls. Despite the variation, in all the three countries, the respondents were agreeable that taxation regimes, custom processes and access to finance have negatively impacted their businesses. Although price controls were not an issue in Nigeria, in Ethiopia and Zambia, the respondents had mixed feedback. In Ethiopia, 38% of the respondents believe that price controls positively impacted their businesses against 25% who believed otherwise. In Zambia on the other hand, 15% believe that price controls had a positive effect compared to 23% who believe to the contrary.

Figure 10: Impact of quality standards compliance and other restrictions disaggregated by country



The study further explored the impact of these restrictions on the prices of products. Accordingly, businesses suggested that disparate restrictions have led to depreciation of the countries' currency and increased cost of doing business, hence leading to increased prices of SAS products. Assorted comments are included in Box 3.

Box 3: Impact of the restrictions on the prices of products

"The restrictions had an impact on the prices of our products, but it was not as such significant." (Respondent, Ethiopia)

"We raised our prices by 20% to 25% due to these restrictions." (Respondent, Ethiopia)

"Our prices are significantly impacted by fluctuations in the local currency, taxation and custom processes." (Respondent, Zambia)

"Yes. These restrictions oblige us to raise our prices, which will make us uncompetitive with solar products smuggled into the market." (Respondent, Ethiopia)

"If we get hit with duty and VAT, our prices go up almost by 50% making it very difficult for the people we target and reach to be able to afford them." (Respondent, Zambia)

"However, the demand side subsidies encourage us to keep the price the same as a grant has been provided by the World Bank to subsidize the consumer price by 20%." (Respondent, Nigeria)

In order to gain broader understanding of the changing policy context, businesses were asked if there were any changes in legal restrictions in the past year and how these changes affected their businesses. Not so many changes were reported, but the few which were mentioned had mixed results. Box 4 highlights some changes that were introduced across the three countries.

Box 4: Change in legal restrictions and how they affected businesses

"Duty levied on the import of productive use energy appliance have been lifted, which is positive for our business." (Respondent, Ethiopia)

"The mandatory requirement of depositing 5% of the total value of imported solar kits in a blocked account to distribute products using MFIs consumer financing facility means money tied up in a bank that we could use to import additional products and increase our turnover." (Respondent, Ethiopia)

"The mandatory requirement to distribute products using youth groups organized by regions obliges us to pay high margins for their services, impacting our profitability." (Respondent, Ethiopia)

"The Finance Act helps with regulations for tax, levies, etc. Some effects some business." (Respondent, Nigeria)

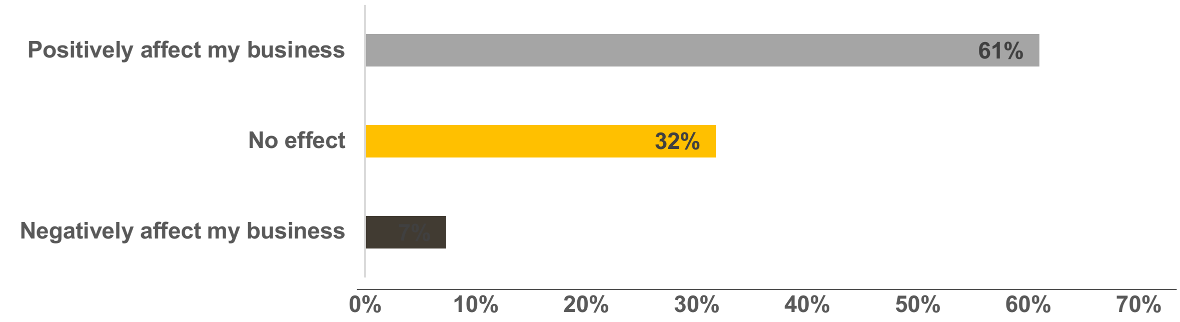
"Type Approval Licensing by ZICTA negatively affected the business, some sales were halted till we attained the relevant certificates for importation." (Respondent, Zambia)

Not aware of any except continued increased cost of doing business and harassment by the many Statutory Regulators." (Respondent, Zambia)

3.2.2 Business perceptions of the impact of fiscal regulations

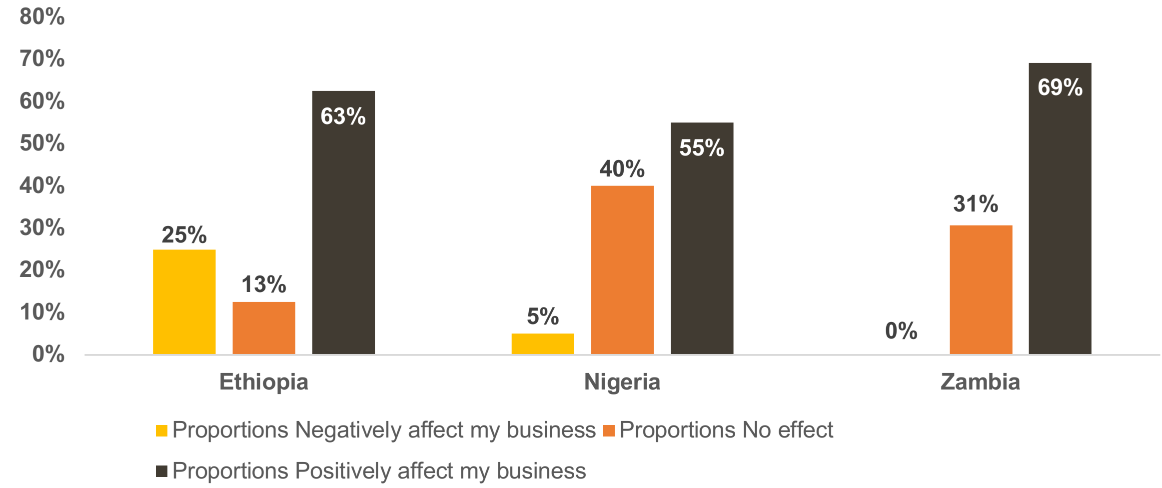
VAT, tax and import duty exemptions are important elements for creating enabling environment to support increased access to SAS products. ACE TAF is famed both for providing the required evidence base through several commissioned research, and for successfully advocating for the host governments to introduce beneficial fiscal regulations inform of tax exemptions and subsidies on SAS products. In this study we sought to estimate the businesses perception of the impact of these fiscal regulatory practices. As shown in Figure 12, approximately 61% of the businesses interviewed across the three countries reported that duty exemptions had a positive effect on their businesses. Only 7% of the respondents believe that their businesses were being negatively affected by policies on subsidies and/or exemptions. Noteworthy is the fact that close to one in three (32%) of the respondents did not think exemptions and/or subsidies had any effect on their businesses.

Figure 11: Impact of duty exemptions and/or subsidies



The country-by-country average perception of duty exemptions was explored. Accordingly, in all countries, exemptions and/or subsidies were perceived to positively affect businesses – reported by 63% of respondents in Ethiopia, 55% in Nigeria and 69% in Zambia as shown in Figure 13. Even with a relatively high proportion reporting positive effect of exemptions and/or subsidies, Ethiopia recorded the highest percentage of respondents who think that the exemptions have had a negative effect on their businesses. At 40% and 30% respectively, Nigeria and Zambia had significant proportion of respondents who did not think subsidies and/or exemptions had effect on their businesses.

Figure 12: Perception of duty exemption by country

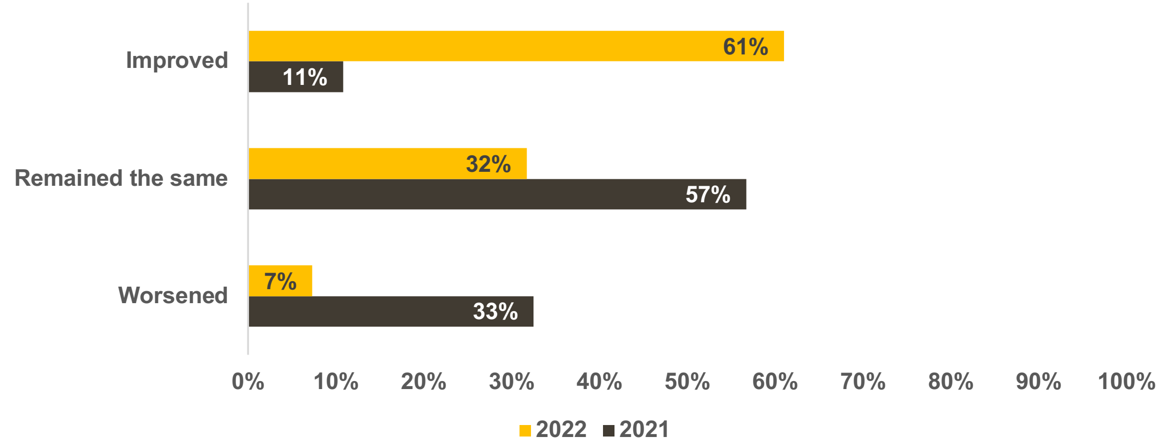


3.2.3 Business perceptions of the current regulatory environment

ACE TAF's main task is to work to improve the enabling environment to catalyse market growth by recommending policy and regulatory changes in line with best practice in the sector. The overall assumption is that, as the environment improves, business and sector stakeholder perceptions of the policy and regulatory environment are likely to improve. Consequently, as part of the study, businesses were asked to indicate their perception of the current policy and regulatory environment. Specifically, as a Likert-type question[2] , the respondents were to score their perception of business environment based on response options which assessed whether the environment has worsened, remained the same, or improved. Since the same question was explored in the 2021 survey, there was an opportunity to compare the two time periods. Accordingly, Figure 14 shows that there is positive trajectory within the policy environment. Majority of the businesses (61%) believe that there has been improvement in the policy and regulatory environment in 2022 compared to 11% in 2021. Similarly, the proportion who believe that the situation has worsened reduced from 33% in 2021 to only 7%. Although the statistical and practical significance of these differences were not explored, anecdotally, this goes to say that the policy and other interventions across the sector have a bearing on the policy and regulatory environment in the ACE TAF countries.

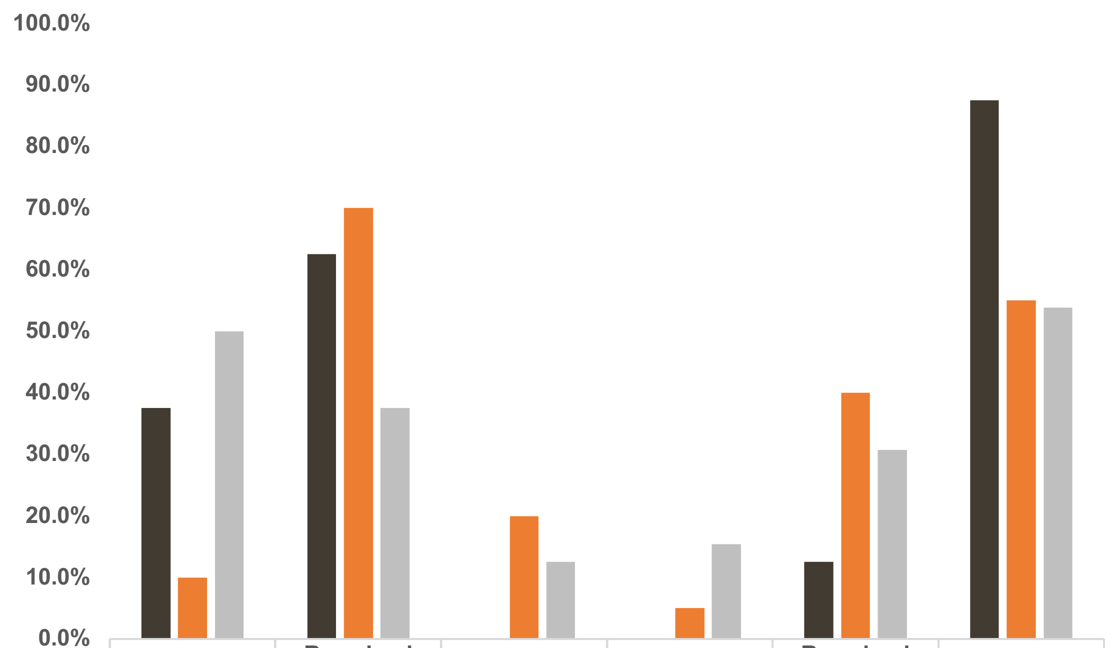
2 *A question which uses a five-point or seven-point scale.*

Figure 13: Perceptions of policy and regulatory environment disaggregated by year of study



There was positive progress in all the response options across the ACE TAF countries between 2021 and 2022 as shown in Figure 15. Notably, across all the countries, there was an increase in the proportion of respondents who believed there was an improvement and a reduction in the number of those who believed the situation has worsened. In Nigeria, for example, those who believed the situation has worsened dropped from 10% in 2021 to 5% in 2022 with a corresponding increase in the proportion who believe that the situation has improved from 20% in 2021 to 55% in 2022. Similar trajectory was witnessed in both Ethiopia and Zambia.

Figure 14: Perception of current regulatory environment by country



	2021			2022		
	Worsened	Remained the same	Improved	Worsened	Remained the same	Improved
Ethiopia	37.5%	62.5%	0.0%	0.0%	12.5%	87.5%
Nigeria	10.0%	70.0%	20.0%	5.0%	40.0%	55.0%
Zambia	50.0%	37.5%	12.5%	15.4%	30.8%	53.8%

Businesses perception of how the governments have participated in regulating the policy environment was explored. Respondents mentioned several policy and regulatory interventions across the three countries including PVOC implementation in Ethiopia, through the awareness and financial support to the sector in Nigeria, and in Zambia, the putting out of the Statutory Instrument on duty exemptions and the government playing its coordination role. Some of these interventions, particularly around quality standards and fiscal policy reforms have been influenced by ACE TAF across the three countries. Highlights from the respondents are as shown in Box 5.

Box 5: Businesses perception of how the government has participated in regulating the policy environment

"PVOC is implemented, which is good. But in the monetary policy front, particularly the continued depreciation of the ETB was not good." (Respondent, Ethiopia)

"The government has been reasonably active in regulating the OGS space, especially the Vice President's Office, the Ministry of Power, and the REA." (Respondent, Nigeria)

"Yes. For example, PVOC has been implemented last year." (Respondent, Ethiopia)

"The authorities are closely involved in the solar sector now as we have witnessed in their prompt intervention in resolving issues of wrong classification of our solar products." (Respondent, Ethiopia)

"They have put out the SI about the duty and VAT being removed. However, that is not always the case, especially at the airport." (Respondent, Zambia)

"The government has been active and involved different stakeholders to the table. This is positive." (Respondent, Zambia)

The study further prioritised an understanding of the perception of the respondents of the changes to the policy environment in 2021 and how these affected their businesses. The main changes to the policy environment over the last year were varied across the three countries. Of the changes some were classified as favourable and others unfavourable to SAS businesses. In Ethiopia the notable changes to the policy environment include continued depreciation of the ETB against the major currencies, limited access to forex and the 5% import duty imposed on SAS products. The only laudable change was the introduction of PVOC influenced by ACE TAF, which raised the businesses' optimism. It is expected that this will improve the business environment by curtailing the import of sub-standard products. The forex issue was not only a problem in Ethiopia; it was mentioned as one of the challenges in Nigeria as well. Other changes in Nigeria including making it mandatory for businesses to comply with e-waste regulations, and imperative for the health clinics to be energised with solar power with the adoption of the Lagos State Electricity Policy. While all the three were considered as positive changes, some businesses reported that the e-waste compliance has led to increased operational cost. Changes were also witnessed in Zambia where the government introduced some changes including Statutory regulations and duty exemptions. The businesses also indicated that the clarity around lithium batteries tax regime still remains a challenge that the Zambian Government is yet to resolve. Observations from the respondents on the changes are captured in Box 6.

Box 6: Main changes to the policy environment in 2021 and how these affected the businesses

"The continued depreciation of the ETB against major currencies, like the USD, had a negative impact on our competitiveness in the market." (Respondent, Ethiopia)

"Access to forex is critical to import solar products as local manufacturing/assembly operation in Ethiopia is very limited. If you do not get access to forex, no import, which means no business." (Respondent, Ethiopia)

"The 5% import duty imposed on imported SAS products was the main policy change introduced last year." (Respondent, Ethiopia)

"Access to forex has gotten worse. Improved payment integration channels for rural areas." (Respondent, Nigeria)

"The introduction of PVOC has been the main change last year. We expect it will improve our business by curtailing the import of substandard products." (Respondent, Ethiopia)

"Positive changes: Imperative for the health clinic to be energized to attend to the covid outbreak. Thus, improving my business's capacity to cater to this need." (Respondent, Nigeria)

"With Lagos State, it has improved due to its new state electricity policy." (Respondent, Nigeria)

"Regulation and tax. Somewhat improves business." (Respondent, Zambia)

"Duty Exemptions. The effect is going to help in the future as implementation is just starting." (Respondent, Zambia)

"PV modules initially taxable then corrected. Lithium batteries tax regime not clear." (Respondent Zambia)

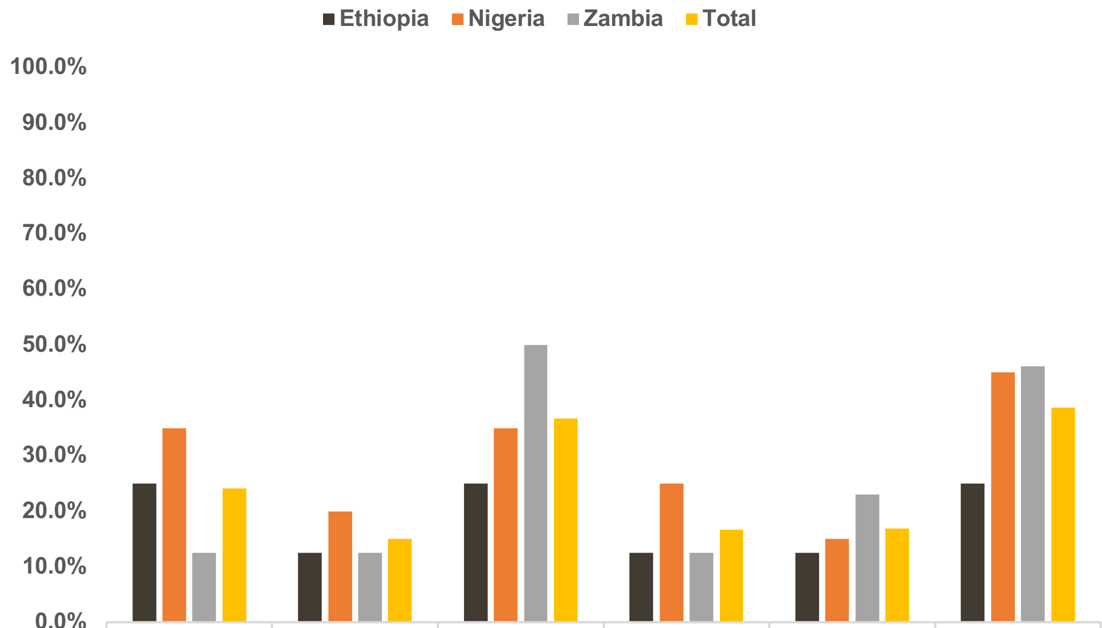
3.2.4 Perception on policy improvement between March 2020 and April 2021

The 2022 study sought to understand the magnitude and the direction of change in perceptions by businesses of the policy and regulatory environment. Respondents were asked to rate, as of March 2022, the overall impact of policy and regulatory reforms on their businesses with the rating scale being: 1 - Not at all favourable; 2 – Less favourable; 3 – Neutral/Indifferent; 4 – Favourable; and 5 – Very favourable. After the analysis, the rating scale was further summarised into two categories, namely "favourable" and "not favourable." The desired end was that the proportion of businesses reporting favourable regulatory and policy environment would improve as the not favourable category reduces.

We conducted a trend analysis to establish the nature and extent of change in perception of the policy and regulatory environment between March 2020 and March/April 2022 as shown in Figure 16. The proportion of businesses reporting unfavourable policy and regulatory environment shows an irregular trajectory between March 2020 and March/April 2022. Whereas, in 2021 the proportion of businesses reporting unfavourable policy and regulatory environment increased from 24.2% in 2020 to 36.7% for the three countries, in 2022 the proportion of businesses reporting unfavourable environment significantly reduced to a favourable low of 16.9% - lower than any of the two previous time periods. Contributing to this mixed trajectory was Zambia where the proportion reporting that the business environment was not favourable dropped to 23.1% in 2022 from 50.0% in 2021. At 12.5%, the regulatory environment in Zambia was better at baseline (2020) than in 2021 and 2022. The situation in 2021 could be explained by the fact that the country was undergoing a political transition as of the study, and such businesses may not have been certain of what to expect.

On the other hand, a trend analysis of the proportion of businesses reporting favourable policy and regulatory environment shows a positive trajectory from March 2020 to March/April 2022. Although there was a stagnation between 2020 and 2021 in both Ethiopia and Zambia, in 2022 all the three countries have shown improved perception of policy environment. In Ethiopia, the percentage reporting favourable policy and regulatory environment increased from 12.5% in 2020 and 2021 to 25.0%. In Nigeria the proportion of businesses reporting favourable market environment improved from 20.0% and 25.0% in 2020 and 2021 respectively to 45.0% in 2022. Finally, in Zambia, the percentage increased from 12.5% in both 2020 and 2021 to 46.2% in 2022. Overall, the proportion of businesses across the three countries reporting improved perception has systematically improved from 15.0% in 2020 to 16.7% in 2021 and 38.7% in 2022 – a 22% increase between 2021 and 2022.

Figure 15: Perception of policy environment between March 2020 and March/April 2022



	2020		2021		2022	
	Percentage not favourable	Percentage favourable	Percentage not favourable	Percentage favourable	Percentage not favourable	Percentage favourable
Ethiopia	25.0%	12.5%	25.0%	12.5%	12.5%	25.0%
Nigeria	35.0%	20.0%	35.0%	25.0%	15.0%	45.0%
Zambia	12.5%	12.5%	50.0%	12.5%	23.1%	46.2%
Total	24.2%	15.0%	36.7%	16.7%	16.9%	38.7%

As part of understanding the context for any future business environment improvement interventions, businesses were asked to share their perception of the main challenges in the SAS market, and reasons for the challenges. Among the challenges listed by the respondents include availability of capital, lack of forex in some countries, lack of technicians to repair and maintain the SAS products; limited awareness on SAS products, a huge number of unbanked customers especially in the rural areas, insecurity, existence of fake solar products, environmental safety concerns, infrastructural changes in rural areas, and lack of incentives to encourage adoption of OGS products in rural areas. While some of the challenges have been dealt with through some of the recent interventions, there is still more that needs to be done. The implementation of PVOC in Ethiopia was especially hailed as a positive move by the Ethiopian Government. This however has been hampered by the lack of access to forex.

3.2.5 Effects of Covid-19 on businesses

Like 2021, the 2022 study sought to understand the respondents' perceptions of the impact of Covid-19 on their businesses. Businesses were asked to indicate what they considered as the main effects of Covid-19 and how they pacified these effects. Businesses had opportunity to reflect back to both 2020 and 2021 business contexts as mediated by Covid-19. Although the Covid-19 persisted from 2020 to-date, the effects witnessed in 2021 were more from the aftermath of the 2020 Covid-19 restrictions environment. Each of the three ACE TAF countries had its own unique challenges given the differentials in how the respective countries responded to the pandemic. For majority of the businesses, the onset of Covid-19 led to restricted flow of money; increased of doing business; inability to collect sales revenue; supply chain disruptions; reduced remittances from the off-grid customers; currency depreciation and financial risks; restricted movements; low demand; reduced sales; rise in SAS product prices; job losses; and project delays. Even after the containment measures were lifted across the three countries, businesses continued to experience the aftermath of the pandemic, including inflation, reduced investor appetite, and currency depreciation. Businesses which were not as resilient were also forced to close. Box 7 provides a list of selected comments on these challenges.

Box 7: Effects of Covid-19 on businesses

"At the beginning of the Covid-19 epidemic, we lost money as we were not able to collect sales revenue from buyers due to the imposition of movement restriction by the government to prevent the spread of the disease." (Respondent, Ethiopia)

"The biggest impact was 2 years ago with the lockdown. However, in 2021, the aftermath of Covid-19 resulted in economic inflation which hampered company growth. We also saw less investor appetite, as we were not able to get any equity investments into our company." (Respondent, Nigeria)

"Currency risks as financing or buying stock is often in foreign currency; depreciation of Zambian Kwacha; delay in recruitment and training of sales agents as well as full time field staff; and delay in expanding the service centres." (Respondent, Zambia)

"Disruption of SAS products supply from abroad and lack of spare parts, to repair damaged products were our two main challenges." (Respondent, Ethiopia)

"Movement restrictions affected distributions, which led to low sales and collections of payment. It also affected end users who earned lesser and thus can't afford the price of the system." (Respondent, Nigeria)

"Covid-19 has contributed to the depreciation of the currency, which has led to an increase in pricing of the business products." (Respondent, Zambia).

All the sampled businesses were and continue to be affected by Covid-19 albeit at different scales. To mitigate the impact of the pandemic and its aftermaths, businesses have adopted a number of coping strategies including cost-cutting measures through reduction of the work force and closing offices; improving operational efficiency by harnessing technology where appropriate, appealing for government and non-governmental support; securing grants; building partnerships; redesigning their business models to cope with the new market realities; and leveraging the power of collaboration with other industry players. Some of the indicative comments are included in Box 8.

Box 8: How businesses are mitigating the effect of Covid-19

"The pandemic brought a huge financial loss because of the movement restrictions. However, we bounced back through Covid solidarity grants for our entrepreneurs to jumpstart their businesses. It helped us to intensify our training programmes with more emphasis on digital trainings to leverage on online conference calls for meetings. It restricted the number of attendees for physical meetings, due to imposed Covid-19 safety guidelines." (Respondent, Nigeria)

"We mitigated this effect by using the existing sales agents as well as full time staff. Importation of our products tend to take longer than pre-Covid period." (Respondent, Zambia)

"Initially, the business could not operate for a couple of months. That helped us to re-strategize our business activities." (Respondent, Nigeria)

"Initially, C19 brought restrictions which brought challenges on reaching client. Renewable energy products were classified as essential services, and we saw increased demands for solar products." (Respondent, Nigeria)

“Integrated with additional payment gateways to make payments more accessible to customers.” (Respondent, Nigeria)

“Since our teams are based out of Lusaka and travel into the field, we have had challenges in the past 2 years when Covid levels were high that we were unable to go into the field. Our main sales were through our partners and agents.” (Respondent, Zambia)

“Due to the pandemic, the organisation reduced on in-person activities such as roadshows, marketing events and presence at traditional ceremonies and agricultural shows (which were closed). To mitigate the challenges, the team were aggressive with telephone marketing and sales.” (Respondent, Zambia)

Despite the pronounced negative effects, some businesses reported to have benefitted a great deal from the Covid-19 context. For some, Covid-19 triggered innovation, brought about stimulus packages, created opportunity for access to grants and debt finance, stimulated better sales and increased demand, and helped businesses to leverage technology for efficient operation. A few comments in this regard are included in Box 9.

Box 9: Positive effects or opportunities brought about by Covid-19

“Because of Covid-19, we got the motivation to develop an online shopping platform to reach out to urban residents.” (Respondent, Ethiopia)

“Covid-19 brought about some stimulus packages to boost the economy. We applied for and won the International Energy Access Relief Fund, which helped us to access dept finance through an investor. The fund was used for working capital and to purchase inventory for the business.” (Respondent, Nigeria)

“In 2020, the effects of Covid-19 were not severe. Our sales were high, the repayment was better; people spent more time home and were making payments of their SHS on time. 2021 was different; the economy had now shown effects of the pandemic; we experienced much lower sales and the repayment was equally affected.” (Respondent, Zambia)

“The government established interventions to support OGS companies and we have benefitted from it (e.g., Solar Naija Programme).” (Respondent, Nigeria)

Additionally, the study sought to understand the existence of government policies that helped or currently supporting businesses to cope in the Covid-19 context. One of the interventions cutting across the three countries was the declaration of OGS companies as essential services during the lockdown. Noteworthy is that this process was largely influenced through the advocacy efforts of ACE TAF. Other policies and interventions include, among others, some governments deferring tax payments for companies, duty exemptions, adoption of favourable policies and extension of SHS grants to businesses. The policy and regulatory interventions during the Covid-19 context are included in Box 10.

Box 10: Government policies that helped businesses during the Covid-19 context

"The government deferred tax payments by companies which was quite helpful." (Respondent, Ethiopia)

"The major government policy that has helped my business has been through the REA-hosted programmed such as NEP, which has helped our business." (Respondent, Nigeria)

"During the lockdown period, OGS companies were given an exemption as essential services, which enabled free movements to sell and transport products in Lagos state." (Respondent, Nigeria)

"The Customs Handbook has helped us to benefit from the duty exemption privilege provided to SAS products as customs officers were better able to identify solar products with new additional functionalities and technology." (Respondent, Ethiopia)

"The Lagos State Electricity Policy was launched last year, and they have given us the legal backing to implement projects. Government is also reviewing the electricity bill." (Respondent, Nigeria)

"The government established interventions to support OGS companies and we've benefitted from it (e.g. Solar Naija Programme). The Government's Economic Sustainability Plan (ESP) provided support to OGS companies." (Respondent, Nigeria)

"The solar industry was declared an essential service and we did not shutdown like many other industries." (Respondent, Nigeria)

There were also government policies that the businesses felt harmed the businesses in the context of Covid-19. Several policies and regulations were listed by the companies that seem to clawback on the SAS uptake in the sector. In Ethiopia the policies include the policy that requires businesses to get approval from the Ministry of Water and Energy (MOWE) before benefiting from a credit facility from the Development Bank of Ethiopia (DBE), which extends foreign currency loans to solar product retailers; the ban imposed on asset based collateral loan; price controls; lengthy approval processes; and lack of forex.

"To benefit from Development Bank and Ethiopia credit facility, which extends foreign currency loans to solar product retailers, the importer has to get approval from the Ministry of Water and Energy (MOWE)." (Respondent, Ethiopia)

"The ban imposed on asset based collateral loan had affected our access to loan for months." (Respondent, Ethiopia)

"Regional MFIs require solar companies to deposit in advance 5% of the value of the imported solar kits into the country to sell their products using the consumer financing facility extended by the MFI. This is unfair as it requires the advance deposit on the total imported products, not specifically on those products planned to be distributed in the region." (Respondent, Ethiopia)

"The protracted approval process by the Regional Energy Bureaus (REBs), which takes up to one year, to distribute solar products in the regions is inefficient and costly." (Respondent, Ethiopia)

"MFIs impose unreasonable price for solar products distributed to consumers using their financing." (Respondent, Ethiopia)

In Nigeria, the business reported several issues with the existing policies and regulations. First, the inconsistent application of some policies. For instance, products that were imported in October 2021 were still being charged the VAT despite the work on importation. There were also issues to do with capital exchange and control, lack of liquidity in US dollars, government decision to shut off telecommunication networks in Kaduna, Zamfara, and Katsina for 3 months between September and December 2021, lack of access to the ports to clear imported goods. The following comments included in below were highlighted by the businesses.

> **"Our Imported products that came in Oct 2021 were still being charged VAT, despite the work on importation. - Capital exchange and control continue to dampen investor sentiments." (Respondent, Nigeria)**
>
> **"The issue with lack of liquidity in US dollars, which is harmful to companies trying to attract international finance, as it gives a negative perception to foreign investors." (Respondent, Nigeria)**
>
> **"Government decision to shut off telecommunication networks in Kaduna, Zamfara, and Katsina for 3 months (Sep - Dec 2021) in an effort to stop the banditry that had been increasing last year. It impacted our revenue and grant money as customer couldn't be verified by phone and physically, as those were no-go zones." (Respondent, Nigeria)**

The main issue in Zambia was with regards to the Statutory Instrument. Businesses were disappointed by the fact that the instrument missed to include solar panels and LED lights as VAT and duty-free products. The respondents further noted that, although this has been rectified, the businesses are still having issues when importing solar lamps. The respondents also mentioned the issue of exchange rate fluctuations as a problem to the businesses.

> **"The issue of the SI not having the solar panels and LED lights as Vat and Duty Free. Although this has now been rectified, we are still having some issues when we are importing our solar lamps. We are trying to help and support these marginalized groups, but are now being charged with duty and vat, making the lights unaffordable. (Respondent, Zambia)**
>
> **"Exchange rate fluctuations." (Respondent, Zambia)**

4. CONCLUSIONS, LESSONS AND RECOMMENDATIONS

4.1 ACE TAF's contribution to the policy and regulatory environment

In conclusion, the findings of the study suggest that there has been improvement in the policy and regulatory environment for SAS businesses between baseline and 2022. While the observable improvement may not be entirely attributable to the ACE TAF interventions, anecdotes from the respondents seem to suggest that they had a bearing on the current business environment. ACE TAF has, for instance, influenced several policies and regulations across the three countries including those that contributed to cushioning of businesses from the impact of Covid-19, particularly the declaration of OGS business as essential service providers. Other critical policies and regulations influenced by ACE TAF include adoption of quality standards (in all the three countries), development of integrated regional strategic electricity plans and policies (Ethiopia and Nigeria), tariff regulation amendments on solar (Nigeria), adoption of PVOC regulation (only in Ethiopia), e-waste regulatory improvements to the government (Nigeria) and adoption of SI 32 and 33 in Zambia; these in addition to capacity building initiative to energy ministries, regulatory bodies and industry associations.

Other than policies and regulations that have been influenced by ACE TAF, the study encouraged businesses to recommend other policy changes. Among the changes recommended by businesses include the need for the harmonisation of the various policy and regulatory instruments as appropriate towards reducing the cost of compliance; using the grants sparingly, as they generally distort the market by introducing unfair advantages; lifting VAT on SAS products; prioritising SAS for access to forex; giving more support to women-led solar businesses to make them competitive in the market; strengthening the compliance on standards; enforcement of quality standards of OGS products; introduce subsidies to end users who have minimal purchasing power; creating credit lines for end users; and policies to encourage local manufacturing - for instance, by the introduction of tax incentives/waivers for local assembly/manufacturing and allowing duty free importation of machinery and raw materials.

The study shows a positive trajectory on business perception of changes in the policy and regulatory environment between baseline in 2020 and 2022. A trend analysis of the proportion of businesses reporting favourable policy and regulatory environment shows a positive trajectory from March 2020 to March/April 2022. The study shows that majority of businesses (61%) believe that there has been improvement in the policy and regulatory environment in 2022 compared to 11% in 2021. Concurrently, the proportion of businesses that believe that the situation has worsened reduced from 33% in 2021 to only 7% in 2022.

4.2 Insights and Recommendations from the Study

Substandard products are still a challenge

Overall, adoption and enforcement of quality standards is viewed by businesses to positively affect the SAS market. However, the huge influx of substandard products is still a big challenge across the three countries. What is required is the intentionality from the respective governments to consistently enforce the standards. As part of ensuring fidelity to the standards there should be continuous training for all relevant government ministries and agencies to improve monitoring of the standards.

The results suggest that majority of the businesses have a positive attitude towards adoption of quality standards. What is required is proper messaging as well as consistent and deliberate enforcement by the standards authority for compliance.

There is need for the governments to support local manufacturing of SAS by allowing duty free importation of machinery and raw materials. The government could also create demand for the SAS products through public awareness of usage of solar and its importance for households and how it can create jobs.

Improvement to equitable financing and incentives required

While the respective governments are making progress in improving the business environment for SAS companies, there is a feeling that more is still required to improve equitable financing for end users and OGS developers alike. For instance, while the Ethiopian Government has been commended for the introduction of PVOC, the lack of access to forex remains an issue which the businesses feel is undermining the possible gains from this development.

There is need for governments to also invest towards helping reduce cost of doing business through other regulatory instruments at their disposal. Such regulations could include subsidies, VAT and tax exemptions and access to finance as well as putting in place the necessary infrastructure. Care should be taken by governments to ensure that duty exemptions are encompassing for all SHS components as possible.

As a commitment to the goal of access to energy for all, in countries where forex remains a challenge, governments should consider giving priority access to forex for SAS businesses to meet the high demand for solar products in the market.

Tangentially, the study reveals that the SAS sub-sector remains male dominated. More government policy and financing is needed to support women led solar businesses to make them competitive in the market.

Harmonization of regulations required

Some of the policies, although intended to support the efficiency and effectiveness in the market, seem to frustrate progress in the sector. In Ethiopia for example the Regional Energy Bureaus (REBs) sign MoUs with solar companies to be able to distribute their products using the consumer financing facility extended through the MFIs. These MoUs have varied requirements such as the agencies to use, the warranty periods, among others. These, although intended to be facilitative, make compliance costly and time intensive. There is need for the Ministries and regulatory agencies to take responsibility in harmonizing these regulations.

There is need for consistency in the enforcement of the regulations. Some businesses felt that governments were inconsistent in the implementation of the regulation with some arguing that government were selective in that there were cases where governments were taxing solar companies that are compliant and leaving those that are dealing illegally. Governments should work to reduce duplication of compliance requirement in the sector by harmonising all these into one point of regulation.

Continue to improve clarity on incentives for solar components

There is need for a clear description of SHS and exemptions on SHS accessories (i.e. radios and torches) that are sold as a SHS kit, and that are beneficial to the customer. In some countries these accessories are taxed highly, which beats the whole process of access to the bottom pyramid since the high cost is transferred to the customer.

5. ANNEX

Interview Topic Guide

This study aims to understand the current perceptions of the policy and regulatory environment related to stand-alone solar (SAS) in the ACE TAF countries. Specifically, the study will gather evidence to understand business perceptions of the fiscal and quality standards policy and/or regulatory environment in their countries, with a focus on changes since baseline data collection in March 2020. Data collected will give a clear picture of the SAS environment and to what extent this enables an effective market for private sector performance in ACE countries, with a focus on changes in the past year. It will also take into account and attempt to quantify changes to the market due to Covid-19.

The survey has ten (10) section. The questions are designed to be administered to SAS enterprises in 14 countries by a research assistant through phone conversation, which should take approximately 45-60 minutes per interview. Topic guides will be shared with respondents prior to the interview to allow respondents to prepare in advance.

Please note that Tetra Tech International Development observes confidentiality and abides to General Data Protection Regulation (GDPR).

*Required

Introduction: for interviewer to read

My name is ____________________. My role in ACE is ____________________. ACE TAF is active in 14 countries and supports the development of policies seeking to improve market conditions for Stand-Alone Solar systems. As part of the implementation of the ACE TAF programme, we are interested in understanding more about your business and the market in which you operate. This is a follow-up on the study which was carried out in March last year. We are particularly interested in knowing more about changes in the policy and economic environment in the past year.

If you agree, we would like to record this interview in order to help us take notes. All our data will be anonymised and we will not trace anything you say back to you. There are no right or wrong answers, and we are simply interested in your opinions and experiences. If we'd like to include a specific quote in our report, we would check that with you beforehand.

1. Would it be all right to record this interview? (Y/N)

Yes ☐

No ☐

Section 1: Reporting Information – to be filled in before interview

2. Please select the country you are reporting on*

Ethiopia	☐	Mozambique	☐
Kenya	☐	Nigeria	☐
Malawi	☐	Rwanda	☐

Senegal		Uganda	
Sierra Leone		Zambia	
Somalia		Zimbabwe	
Tanzania		Ghana	

3. Select date of interview*

Format: M/d/yyyy

Section 2: Business Information – to be filled in before interview (to the extent possible)

4. Name of the business*

5. Name of the respondent*

6. Role of the respondent*

- Managerial/Senior level
- Supervisory/Middle level
- Junior/Entry level
- Owner

7. Phone number of the organisations/respondent (Please start with the country code)

The value must be a number

8. Email address of the respondent

9. Was the business interviewed at baseline?*

Yes No

10. Was the same respondent interviewed at baseline?*

Yes

Business not included at baseline

No

11. Is the business female-led? (The top-most person of the business is a woman)*

Yes

No

12. Is this business registered in [country of interview]?*

Yes

No

13. When was the business registered?

Format: mm/dd/yyyy

14. What countries does this business sell products in? (Please list countries or regions).

Section 3: Business Product

15. How many brands of stand-alone solar (SAS) product(s) does this business sell?

The value must be a number

16. Can you please provide the name of the brands of stand-alone solar (SAS) product(s) that your company sells?

17. What is the size of the stand-alone solar (SAS) solutions (in Watt-peak) that you sell? Kindly select all that apply. (Please note that SAS include both productive and domestic use SHS)

3 - 10.999 Wp

11 - 20.999 Wp

21 - 49.999 Wp

50 - 99.999 Wp

100 Wp +

18. Have there been any changes in your product offering in the past year? What have been the most important changes and why did those take place?

Section 4: Target Market

19. What sales distribution model does your business employ?

All sales are directly to end users (B2C model) [ ]

All sales are to other businesses (retailers)(B2B model) [ ]

Both end users and businesses [ ]

20. Who are the main target end users of your product? (Probe: who are you trying to reach with your product?)

21. Does this include any marginalized or hard-to-reach groups?

Yes [ ] No [ ]

22. If yes which of these marginalized groups is your business targeting?

Women [ ]
Youth [ ]
People with disabilities (PWDs) [ ]
Internally displaced persons [ ]
Refugees [ ]
Nomadic communities [ ]
Marginalized households [ ]
Last-mile customers [ ]
Other (specify)

23. Is your business facing any challenges in reaching those groups? If yes, which are the most important ones?

24. What efforts are you making to reach the marginalized target group(s) mentioned above?

25. Have there been any changes in your target market in the past year? What have been the most important changes and why did those take place?

Section 5: Sales

26. How many SAS units did you sell in 2019? (Based on the list of SAS products reported – Section on Business Product)

The value must be a number

27. How many SAS units did you sell in 2020? (Based on the list of SAS products reported – Section on Business Product)

The value must be a number

28. What have been the main effects of COVID-19 on your business? What challenges has it brought about? How did you mitigate those challenges?

29. Have there been any positive effects of opportunities brought about by COVID-19? What were those and how did you leverage them?

30. Was there any government policy that helped your business during this time? If yes, which have been the most important and why?

31. Was there any government policy that harmed your business during this time? If yes, which have been the most important and why?

Section 6: Quality Standards

32. Are your products compliant with any quality standards? If yes, which ones?

IEC standards

Lighting Global standards

National Standards

Not aware of any standards

Other (Specify)

33. If complaint, when did your product(s) receive the National Standards, Lighting Global, IEC Quality Verification or other quality verification? Please specify the year for each.

34. If not complaint, what are some of the barriers your business is facing to achieve compliance?

35. Are you aware of any changes to National Standards for stand-alone solar products during the past year?

Yes

No

36. If yes, what changes were the most important and how have these changes impacted your business?

Section 7: Fiscal regulations

37. Are you aware of any duty exemptions and/or subsidies to support stand-alone home systems?

Yes ☐ No ☐

38. How would you rate the impact of duty exemptions and/or subsidies on your business operations? (1 - negatively affect my business; 2 somewhat affect my business; 3 no effect; 4 somewhat positively affect my business; and 5 positively affect my business)*

1	2	3	4	5
☐	☐	☐	☐	☐

39. On a scale of 1-5, please rate the extent to which the following restrictions affect your business? (1 - negatively affect my business; 2 somewhat affect my business; 3 no effect; 4 somewhat positively affect my business; and 5 - Positively affect my business)*

	1	2	3	4	5	**Not applicable/ don't know**
Customs process	☐	☐	☐	☐	☐	☐
Access to finance	☐	☐	☐	☐	☐	☐
Quality standards compliance	☐	☐	☐	☐	☐	☐
Taxation regimes	☐	☐	☐	☐	☐	☐
Price controls	☐	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐	☐

40. If include 'other' please specify what restriction this is.

41. Are there restrictions having an impact on the prices of your products? If so, how significantly are your prices impacted?

42. Have there been any changes in legal restrictions in the past year? How did those changes affect your business?

43. Have these regulatory environment changes impacted your ability to get financing, and if yes, how?

Section 8: Business perceptions of the policy and regulatory environment

44. Thinking back to March 2020, what was the impact of policy and regulatory reforms on your business? (1 - Not at all favourable; 2 - Less favourable; 3 - Neutral/Indifferent; 4 - Favourable; and 5 - Very favourable)*

1	2	3	4	5

45. How would you currently (as of April 2021) rate the overall impact of policy and regulatory reforms on your business? (1 - Not at all favourable; 2 - Less favourable; 3 - Neutral/Indifferent; 4 - Favourable; and 5 - Very favourable)*

1	2	3	4	5

46. Looking at the current regulatory environment, has this improved, worsened or remained more or less equal compared to the situation one year ago? (1. Worsened significantly; 2. Somewhat worsened; 3. Remained the same; 4. Somewhat improved; 5. Improved significantly)*

1	2	3	4	5

47. Over the last year, do you feel that the government has been active in regulating the policy space, and if so how?

48. What have been the main changes to the policy environment over the last year? How did these affect your business (probe for improvement or worsening)?

49. How has the cost of compliance with the regulations and policy changed over the past year? (1 - Increased; 2 - Slightly increased; 3 - No change; 4 - Slightly decreased; and 5 - Decreased)*

1	2	3	4	5

Section 9: Lessons and best practices

50. Aside from what we already discussed, are there any other policies which you think could potentially support the SAS market in your country? Why?

51. What do you see as the main challenges in the SAS market currently? Why?

52. Has this changed in any way in the past year? How and why?

53. Do you have any other comments on the SAS business environment in your country?

54. Do you have any questions for us?

55. Are there other businesses in [country] you would suggest speaking to for our study?

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