

Sierra Leone: Impact Assessment of Goods and Services Tax (GST) and Import Duty Exemptions on Stand-Alone Solar (SAS) Products

Report | June 2021





Foreign, Commonwealth and Development Office (FCDO) Africa Clean Energy Technical Assistance Facility

© June 2021

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This report was authored by Africa Clean Energy Technical Assistance Facility with contributions from Alfred Akibo-Betts and Peter Soulaïman Bangura.

Prosperity House, Westlands Road,
P.O. Box 4320, 00100, Nairobi, Kenya.
Tel: +254 (0)20 271 0485

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ABBREVIATIONS AND ACRONYMS

Acronym	Definition
ACE TAF	Africa Clean Energy Technical Assistance Facility
AfDB	African Development Bank
ECOWAS	Economic Community of West African States
EDSA	Electricity Distribution and Supply Authority
EGTC	Electricity Generation and Transmission Company
EE	Energy Efficiency
FCDOUK	Foreign, Commonwealth & Development Office
GIZ	German Agency for International Cooperation
GOGLA	Global Association for Off-grid Solar Energy Industry
GST	Goods and Services Tax
IRP	Integrated Resource Plan
MCCU	Millennium Challenge Coordinating Unit
MoE	Ministry of Energy
MTNDP	Medium-term National Development Plan
NRA	National Revenue Authority
NEP	National Electrification Plan
OGSE	Off-Grid Solar Energy
RE	Renewable Energy
REASL	Renewable Energy Association of Sierra Leone
SAS	Stand-Alone Solar
SHS	Solar Home Systems
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Objectives

This report presents results of the socioeconomic modelling that assessed the impact of the current tax regime on Stand-Alone Solar (SAS) products in Sierra Leone. This study builds on a recently developed ACE TAF responsible taxation tool and multi-country study piloted in Malawi, Rwanda and Sierra Leone.¹ This study covers country-specific estimates of the impact of the exemptions, tracing back to the five years before the exemptions and the five years after the exemptions. The objective of the modelling is to provide a socioeconomic impact assessment of past, current, and future tax exemptions, SAS sector development, fiscal outcomes in terms of total tax receipts generated, and socioeconomic development.

The analysis provides an evidence base for how Goods and Services Tax (GST) and import duty exemptions have, and will continue to, support the reach of SAS products. Specifically, this report explores the extent to which the exemptions have been effectively applied to solar photovoltaic (PV) systems ranging from a solar lantern to solar home systems that include other components and appliances. While the exemptions directly impact government revenue in terms of foregone taxes, they also accelerate access to SAS products, deliver jobs in the value chain, improve livelihoods to households and small businesses, and a range of other benefits.

Summary of approach

This study uses the ACE TAF multi-country responsible taxation tool then integrates additional data and stakeholder analysis to deepen the exploration of Sierra Leone's context. In particular, the study engaged 14 stakeholders and gathered more information on the number of SAS importers, uptake of solar products by households, number of persons with jobs in the SAS sector and other socioeconomic benefits such as household savings, health risks and hours of study. The socioeconomic impact model builds on previous studies, particularly the series carried out with support from UK DFID's (now FCDO) Energy Africa program between 2016 and 2018 in Mozambique, Uganda, Malawi and Zambia.² These informed the development of the ACE TAF responsible taxation tool.

Key findings

Since the introduction of GST and import duty exemptions, the number of households with access to SAS products increased from 0.8 percent in 2015 to 6.6 percent in 2018.³ Based on this trajectory and a reasonable but ambitious growth rate for the SAS industry, SAS products could reach 12 percent of households nationwide, including those in poor and hard to reach rural communities, between 2021 and 2025. The fiscal cost is approximately USD 106,680 (NRA estimates), but the benefits of increased access to clean energy could be significant, especially savings from the use of SAS products compared to other fuels like kerosene. The effect of the exemptions and the decrease in the number of households using kerosene and candles is more nuanced. When the secondary fiscal benefits associated with reduced health issues are considered, then the policy could yield a net benefit of more than USD 4.8m over the next five years and between 264 and 300 premature deaths could be prevented every year from fires linked to candles and kerosene lamps.⁴



This report explores the extent to which the exemptions have been effectively applied to solar photovoltaic (PV) systems ranging from a solar lantern to solar home systems that include other components and appliances.

4. National Force, 2018 Annual Report.

Recommendations

1. Maintain GST and import duty exemptions for SAS products for at least the next five years
2. Tie exemptions to a clear, identifiable, and well understood quality verification process
3. Improve coordination and build capacity among private and public sector entities to ensure effective and efficient implementation of exemptions
4. Build consumer awareness of high-quality SAS products to establish confidence and trust to enable the market to scale
5. Over time, improve the mix of financing options available for companies and consumers to ensure SAS products are affordable for all households.

1. INTRODUCTION

This report presents the results of the socioeconomic modelling undertaken to assess the impact of the current tax regime on Stand-Alone Solar (SAS) products in Sierra Leone. It provides a summary of how the modelling exercise was carried out, the assumptions made and the impact of the GST and import duty exemptions on socioeconomic development.

This report explains the methodology used in modelling and analysis of the data, including the relationship between socioeconomic variables and tax regimes before, during and after 2016 when GST and import duty were exempted for SAS products that met IEC quality standards. The cost-benefit analysis of increased access to SAS versus the forgone taxes is also presented. Recommendations are then made on actions that would ensure sustainable access and affordability of clean energy through tax exemption policies.

1.1 Structure of the report

The remainder of this report is structured as follows:

- ◆ **Section 2** provides a short context to the Sierra Leone power sector, the off-grid solar sector, and the national revenue / fiscal situation.
- ◆ **Section 3** describes the methodology deployed for both stakeholder engagement and the quantitative analysis deployed in this assessment.
- ◆ **Section 4** presents the key findings of the assessment.
- ◆ **Section 5** sets out key recommendations and next steps.



Photo courtesy: www.businessgreen.com.

2. SIERRA LEONE ENERGY SECTOR CONTEXT

2.1 Energy Sector Context

Sierra Leone's energy production and use remain very small compared to other countries (besides Liberia) within the Mano River Basin⁵, such as Guinea (566 MW) and Ivory Coast (2,200 MW). Sierra Leone's energy sector needs are under-resourced, and the scarcity of reliable energy supply is one of the key impediments to the country's economic and social development.

The country's energy consumption is dominated by biomass, accounting for approximately 80 per cent of primary energy consumed.⁶ The largest biomass energy source is wood fuel and charcoal, which meet nearly 97 per cent of household cooking needs.⁷ Imported petroleum products are the next most significant source of energy for power generation, which is around 13 per cent of energy consumption. In 2016, about 24 per cent of households had access to electricity (on-grid and off-grid), representing approximately 240,000 households.⁸ The urban electrification rate was over 30 per cent and the rural electrification rate slightly above 15 per cent.

The establishment of a national generation and transmission company and a separate electricity distribution company in 2011 aimed to improve the energy supply. The creation of the Electricity Generation and Transmission Company (EGTC) and the Electricity Distribution and Supply Authority (EDSA), which resulted in the dissolution of the National Power Authority (NPA) in 2011, was meant to improve electricity generation, transmission, and distribution capacity to enhance access to sustainable power supply in the country. However, these institutions' establishment and functionality have not significantly improved electricity access in most district headquarters in the country. Besides the national capital, Freetown, where slightly more than two-thirds of households have access to electricity and the regional capitals of Bo, Kenema, Makeni and Port Loko, where hydropower is mainly supplemented by thermal power in the dry season, most district headquarters and other major towns have limited access to the grid but have solar streetlights.

To increase access and affordability to electricity, the Government of Sierra Leone took the bold step to sign the Energy Africa Compact Agreement in 2016 (and revised in 2019). This included, among other things, ambitions to reform and implement policies that will create an enabling environment for private sector participation in the solar market and to work alongside the government in achieving 80 per cent access rates by 2030. Key among these policy reforms is the exemption of GST and import duty on all IEC certified SAS, documented and provided for in the Finance Acts of 2016-2020. Importers of SAS have benefitted from this reform by saving at least 40 per cent from cost reduction on products that meet the standards specifications.

2.2 Standalone Solar Sector Context

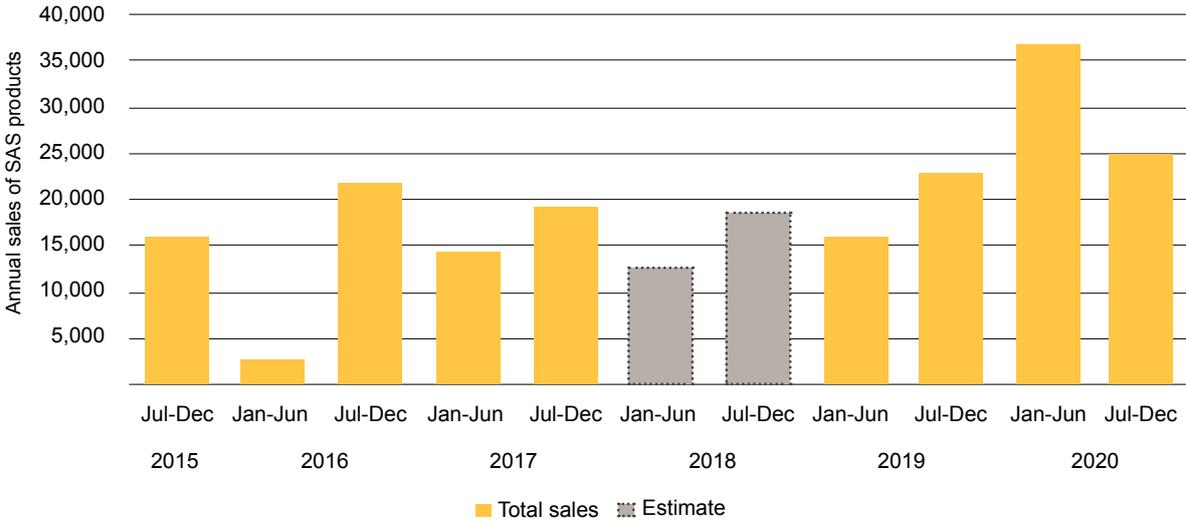
Sales of standalone solar products have grown slightly year-on-year over the past five years. As shown in Figure 1, 2020 has seen the highest volume of units sold in Sierra Leone, with over 62,000 SAS products entering the country.⁹ Nonetheless, there are still 5.8 million people (around 1 million households) without access to electricity, and if the government is to achieve the target to reach 92% access by 2030, the pace of growth of the SAS sector will have to increase rapidly.¹⁰

6. UNDP, (2012) *National Energy Profile of Sierra Leone*

8. *Financial Sustainability Plan for the Power Sector (FSPPS) of Sierra Leone (updated in March 2020)*

Nonetheless, the relatively strong track record of sales throughout 2020 – despite the COVID-19 pandemic – is encouraging. Companies have proved relatively resilient, with the introduction of new distribution channels and business models contributing to increased financial inclusion as well as access to reliable and affordable energy services, including the entry of a new market player, Felicity Solar Technology.¹¹

While the government of Sierra Leone has maintained import duty and tax exemptions on solar products, no study has been carried out on the past, current, and future value of such exemptions. As the exemptions have been in place since the first recorded sales of SAS products, this study had therefore provided the opportunity to compare the cost-benefit over the period when both import duty and GST exemptions were in place for SAS products that meet IEC standards. This study aims to support the government and industry stakeholders by developing a deeper understanding of the impact the exemptions have had on SAS sector development, fiscal revenues, and broader socioeconomic development.



*Notes: No sales data is available for 2018, so this data is estimated on the basis of the previous and subsequent years' sales
Source: GOGLA half-yearly market reports*

3. APPROACH AND METHODOLOGY

This study uses the ACE TAF multi-country responsible taxation tool then integrates additional data and stakeholder analysis to deepen the exploration of the Sierra Leonean context. The socioeconomic impact modelling started with reviewing a series of the Energy Africa impact studies on SAS taxation and socioeconomic development, including the cost-benefit models used for Mozambique, Uganda, Malawi and Zambia. This was helpful in identifying the key elements of tax regimes on SAS products and in bringing out other elements that were not included due to data limitations.

This quantitative analysis was supported and deepened by stakeholder engagement. In particular, we engaged 14 stakeholders and gathered further information on SAS importers, uptake of SAS products by households, jobs in the SAS sector and other socioeconomic benefits such as household savings, health risks and hours of study. This was followed by continuous engagements with SAS marketers to obtain information on the differences in the volume of imported products and sales volumes, before and after tax exemptions. Tax policy implementers were also engaged in obtaining information on the revenue generated and revenue forgone before and after the tax exemptions, respectively.

Alongside the stakeholder engagement, further data and literature were collected to make sure the analysis is as tailored as possible to the Sierra Leone context. We also collected further data from Statistics Sierra Leone to make sure that the results are tailored to and relevant for the Sierra Leone context as much as possible. For example, we collected data on revenue generated from GST and import duty taxes for the past five years before the implementation of the exemptions (2011 to 2015) and the uptake of SAS products by households during this period. Data on the latter was also obtained for the current period of tax exemptions implementation (2016 to 2020), and the uptake of these products and their cost-benefit trade-offs were forecasted for the next five years (2021 to 2025).

These three steps enabled a comparison of market development in the past five years – and potential in the coming five years – with and without tax exemptions in place. The results presented below compare the previous five years of SAS sector growth, and the future five years, and assesses the impact of the GST and import duty regimes on the uptake of products, the tax revenue foregone against the benefit accrued from the growth of the market due to the exemptions and to estimate the accessibility and affordability of electricity by households vis-a-vis the achievement Sustainable Development Goal (SDG) 7.

3.1 The Results of the Stakeholders' Engagement

The results of the stakeholders' engagement focused on the following:

- i) The emergence of the SAS product market
- ii) Quality assurance
- iii) SAS product market before 2016
- v) The growth of the SAS product market in Sierra Leone and tax policies
- vi) Socioeconomic impact; and
- vii) Sustainability of the SAS product market and universal access to energy

The use of SAS products started as far back as 1993 with the use of solar panels to power telecommunication facilities in the provinces by Sierratel. However, the use of the products became popular between 2010 and 2015 when households started using SAS products for domestic lighting. Rural electrification programme using solar lighting systems began in 2016.

The Sierra Leone Standards Bureau remained the leading agency for formulating policies to ensure that quality SAS products were imported into the country. The 2016 Finance Act provided that SAS products that meet the International Electrotechnical Commission (IEC) certified quality standards were exempted from the Goods and Services Tax and Import Duty. Accordingly, the Sierra Leone Standards Bureau established a committee to adopt and implement the IEC standards to inspect and verify SAS products imported into the country. Other quality

assurance policies implemented included the Energy Efficiency Policy of 2016 and the Testing and Verification Policy to ensure that SAS products coming into the country meet the IEC standards before entering. The Standards Bureau also instituted general quality control systems.

These policies ensured that quality SAS products that meet customers' satisfaction were imported into the country. It is important to note that the government is serious about standards as the findings from the interviews revealed that one of the importers was blacklisted for shipping in sub-standards SAS products into the country.

There was not much demand for SAS products before 2016. The demand was described to be average, whilst the supply was described to be low. There were few importers of SAS products, and the volume of sales of SAS was not significant before 2016 because substandard product was in the market. Customers were dissatisfied with the quality of the SAS products they bought.

To encourage more actors into the SAS business and make energy available and accessible to all, as enshrined in Goal #7 of the Sustainable Development Goals (SDG), the Government of Sierra Leone should formulate decisive policies that will open the SAS market. Among the current policies are:

- ◆ The 2016 Finance Act, which among other things, provided for a GST and imported duty waiver on SAS products that meet the IEC quality standards – Tax exemption policy to encourage importers to import quality SAS products.
- ◆ The Renewable Energy Act of 2016.
- ◆ The Energy Efficiency Policy.
- ◆ The Energy Sector Road Map that the energy sector now uses for enhancing renewable energy.
- ◆ The Finance Act of 2017 provided a GST waiver on the importation of SAS products.
- ◆ Section 55 of the recent 2021 Finance Act provides GST waiver and corporate tax relief.

In terms of socioeconomic impact, the findings from the stakeholders' engagement show that once available, it was cheaper and safer to use SAS products than fossil fuels like kerosene. The use of kerosene for lighting had decreased considerably even before 2016, where only 1.2 per cent of households used kerosene compared to 76.4 per cent that used rechargeable lights (Sierra Leone 2015 Population and Housing Census Report). However, kerosene is still used for burning in kerosene lamps and domestic heaters or furnaces, as a fuel or fuel component for jet engines and as a solvent for greases and insecticides.

Information obtained indicated that households could save between 40 and 50 per cent of their income. On average, households can save about Le250,000 a month by using SAS products compared to fossil fuels.

Regarding sustainability and universal energy, the stakeholders' engagement asked what should be done to ensure that SAS products are available and accessible to all regardless of geographic location.

It was reported that the SAS products could be sustained to provide universal access to energy if the following is done:

- ◆ SAS products should be available to those who want to use them; therefore, a demand assessment should be carried out to determine who wants to use SAS products;
- ◆ A national platform should be established for the availability and accessibility of SAS products;
- ◆ Reduce the cost of products to make them more affordable;
- ◆ Intensify marketing;
- ◆ Solar technology should be appropriate for any geographic location and demographics;
- ◆ Awareness, cost utilisation and use of these technologies in a different location will assist in making SAS products available and accessible to all;
- ◆ There should be regulations on the type of SAS products for various locations;
- ◆ Enhance the capacity of Standards Bureau inspectors to validate products that meet IEC standards;

- ◆ Increase the number of skilled technicians to install and maintain SAS equipment;
- ◆ Government to formulate a policy for rural electrification that gives access to high-quality SAS products to rural communities;
- ◆ Find appropriate ways of funding and mechanisms to access these products; continue with the tax exemption to induce importation of quality products;
- ◆ Access to energy should be treated as a human issue, and micro-credit schemes should be developed to ensure that energy is accessible and affordable to rural communities.

3.2 Analytical Framework

This section describes the analytical framework used to assess the impact of the GST and import duty exemptions on SAS products. The framework explores the cost and benefit trade-offs from tax exemptions by comparing Sierra Leone's prevailing regime of exemptions to four different tax scenarios:

- ◆ No GST/No Duty
- ◆ Import duty on/No GST
- ◆ GST on/No import duty
- ◆ Both GST and duty on

The findings from the stakeholder engagement showed that besides the GST, which was at a standard rate of 15 per cent, there were other taxes potentially applicable to SAS imports. These included a 20 per cent import duty and 0.05 per cent in ECOWAS levies. Four scenarios were used to consider the impact of the 15 per cent GST and the 20 per cent import duty.

For each scenario, the impact is assessed against the level of accessibility, the fiscal and non-fiscal benefits associated with the policy and where possible, such impact is quantified. Fiscal impacts include the reduction in tax receipts (e.g., from extending a tax exemption) as well as the direct consequences of increased access on households. The non-fiscal benefits include the benefit of increased study hours for school children.

3.3 Modelling Assumptions

The ACE TAF responsible taxation tool is used to simulate the fiscal and household impacts of the SAS industry under different tax regimes. The timeline considered is from 2016 to 2020 – over which period GST and import duties have (up to now) been in place. and project the impact from 2021 to 2025.

Some of the main impact pathways and assumption in the quantitative analysis are:

- ◆ In the short term, maintaining GST and import duties represents a loss in tax revenues that could otherwise have been collected. However, as the sector grows, the future potential to raise GST and import duties rise, and importantly so does the potential to raise other forms of taxation from the SAS value chains.
- ◆ With exemptions in place, the SAS sector can reach more households through both (1) the direct effect of lowering end-user prices and making SAS products more affordable, and (2) the indirect effect of contributing to an enabling environment which attracts investment and private sector entry to/ expansion in the market.
- ◆ Corporation tax receipts and income tax receipts would be expected to increase as the SAS industry grows: In the short to medium term, it is unlikely that companies will make significant margins, and therefore the potential to increase corporation tax receipts is likely to be a longer-term impact once the Sierra Leone SAS industry matures. However, as the SAS value chain generates – often formal sector – jobs, as the sector grows in the short to medium term. These jobs not only support salaries and livelihoods but will also contribute to direct income tax receipts.
- ◆ The SAS industry generates employment opportunities and productive economic potential for households. As described in the bullet above, the SAS value chain generates valuable jobs in the green economy at a range of skills levels. Furthermore, many households who access SAS products put their system to productive use; starting a business, diversifying income sources, or increasing work hours. In this way, a thriving SAS sector

will support improvement in rural livelihoods and also support economic growth and access to information and communication technologies. The benefits of improved productivity and economic empowerment often impact women and people in more vulnerable communities.

- ♦ Access to SAS technologies delivers a wide range of non-monetizable benefits for households. These include (1) reducing the risk of fire, consequent premature deaths and loss of property due to the use of kerosene and candles, (2) reducing the impact of the use of firewood on local environments, and of burning fossil fuels on CO2 emissions, (3) increased access to lighting for study hours for students, contributing to raising national skills levels.

3.4. ACE TAF Fiscal Incentive Tool Guide

The Sierra Leone tax study used the ACE TAF multi-country responsible taxation tool, which provides a quick and clear understanding of the impact of different taxes on a range of fiscal and socioeconomic development outcomes. Results from the tool provide an evidence base to support decision-making and do not advocate any specific tax policy, recognising that governments will have to weigh important short-term and long-term considerations. To support this decision-making process, it presents the impact of up to four tax policy options for both GST and duties that affect the development of the SAS sector. Further, it shows the development of the sector will affect energy access in deficit communities and how this, in turn, will impact the fiscal base through a wide range of other tax mechanisms. Finally, it estimates the value of the SAS sector on additional socioeconomic development priorities, including job creation, education, and health, so that the trade-offs inherent in different tax policies and their associated outcomes can be examined.

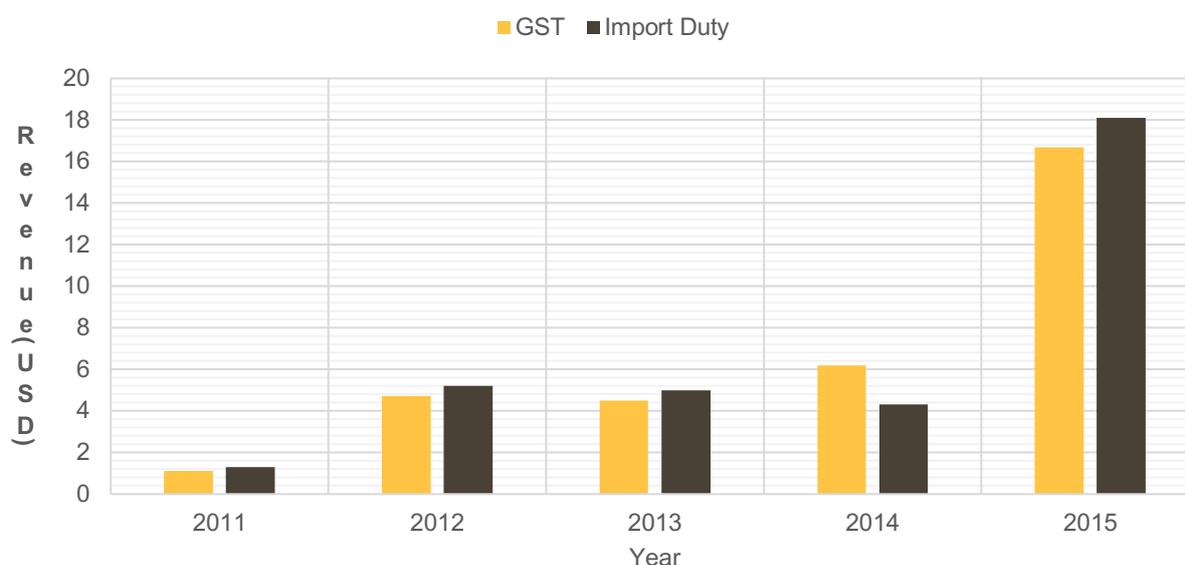
The tool is aimed primarily at the Government of Sierra Leone, although it is flexible enough for a range of stakeholders. It should also be used by renewable energy associations and companies who want to examine the evidence base when engaging in public policy debates. Furthermore, it may support regional dialogue with a view of harmonising duty and/or GST regimes across national jurisdictions.

4. FINDINGS

4.1 Revenue Generated from GST and Import Duty between 2011 and 2015

The potential revenue generated from GST and import duty before the exemptions ranged from USD 2,379 in 2011 to USD 34,824 in 2015.¹² Continuous implementation of this tax regime would have generated estimated average annual revenue of USD 42,672 between 2016 and 2020 (import duty and GST were both levied in 2016 and 2017 whilst GST continued till 2020). GST was charged on SAS products that came with other gadgets like cables, plugs and for SAS products that did not meet the IEC quality standards. etc.

Figure 1: Revenue generated from GST and import duty 2011 and 2015



Source: National Revenue Authority

During this period, there were only five importers of SAS (stakeholders' engagement report) with an average of 50 employees. The income tax generated from this was about USD 15,000 per annum. When the tax exemptions were implemented in 2016, the number of importers rose to 27, with 945 employees paying an annual income tax of over USD 283,500. There are other benefits within the job market, including an increase in household consumption among employees of SAS products.

4.2 Tax Scenarios

Taxes	GST		Import Duty	
	Component-based	Plug-and-play	Component-based	Plug-and-play
Scenario 1 (No GST/ No duty)– Current Regime	0.0%	0.0%	0.0%	0.0%
Scenario 2 (Import duty on/ No GST)	0.0%	0.0%	20.0%	20.0%
Scenario 3 (GST on/ No import duty)	15.0%	15.0%	0.0%	0.0%
Scenario 4 (Both GST and import duty on)	15.0%	15.0%	20.0%	20.0%

Source: Multi-Country illustration table

12. (2011 - 2015) National Revenue Authority Import duty and GST revenue data

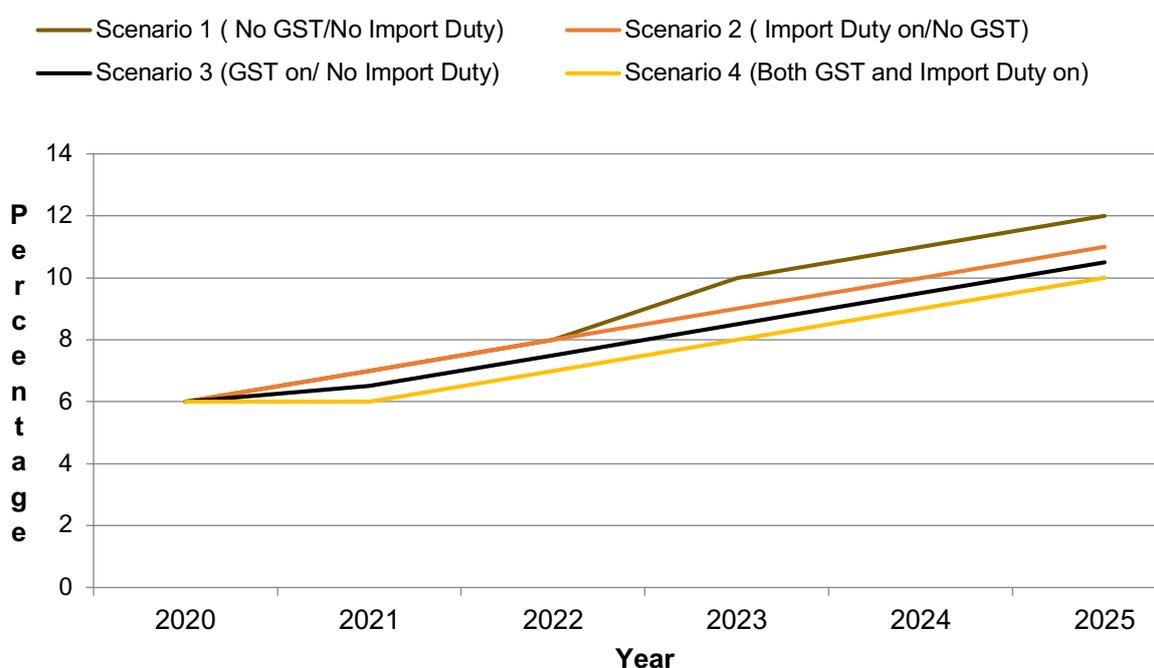
4.3 Scenario Outputs

Achieving Universal Access to Energy

When the GST and import duty were in place five years before the exemptions, less than 1 per cent of households had access to electricity through solar energy.¹³ With the GST implementation and import duty exemptions, access to electricity from solar energy increased in 2018 to 6.6 per cent of households from 0.8 per cent in 2015, just two years after the exemptions were implemented.¹⁴ Since that time, the SAS market had grown from 5 importers in 2016 to 27 importers in 2020. Maintaining the GST and import duty exemptions with effective monitoring of sale prices and awareness raising will continue to increase the SAS market growth and hence access to electricity through solar energy.

However, imposing GST and import duty on SAS products will slow down the sector’s growth and reverse the gains in achieving access to universal electricity. The imposition of taxes would increase prices, making SAS products less affordable to households, which would slow down the growth of the sector from reaching 12 per cent of households to just 10 per cent in the next few years (effectively reducing the new connections by at least 30%). Given the ambitious target to achieve universal access by 2025, this reduced rate will clearly limit the reach and leave many households behind.

Figure 2: Percentage uptake of SAS by households based on tax scenarios compared to National Off-grid access targets between 2020 and 2025



Source: Model output

Fiscal Impacts

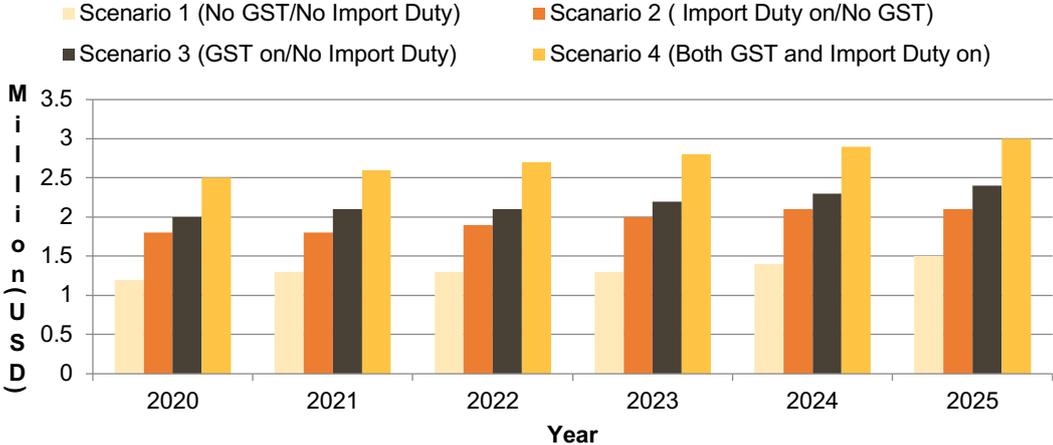
The introduction of the GST in 2009 ushered in a new tax regime where all goods and services sold or paid for were taxed at 15 per cent of the value of goods or services. It was a new tax system that replaced seven cascading taxes: the Restaurant and Food Tax, Entertainment Tax, Hotel/Accommodation Tax, Import Sales Tax, Professional Service Tax, Domestic Tax and Message Tax. The GST is designed to provide a broad-based system that ensures that revenue responds positively to growth in all sectors of the economy. Therefore, applying full GST and complete import duties for SAS products in Sierra Leone could generate an additional USD106,680 annual average in national revenue by 2025, and total exemption of GST and import duty could mean a loss of

13. Sierra Leone (2015) Population and Housing Census Report

14. Sierra Leone (2018) Integrated Household Survey Report

such revenue. The GST would be the primary source of government revenue from the SAS sub-sector. While these taxes would generate returns in the short term, they should be considered against the offsetting of fiscal effects from other types of taxation generated by a growing SAS sector, and the broader economic benefits the sector will generate, including an increase in corporate tax as it grows, increase in socioeconomic activity as access to electricity intensifies and income tax from employees as jobs are created in the solar value chain.

Figure 3: GST and import duty generated by the SAS sector

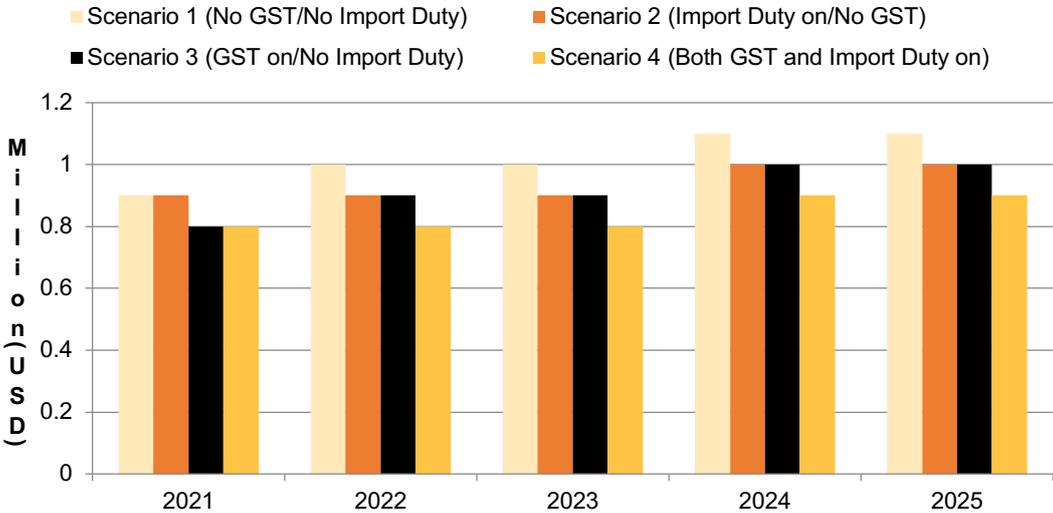


Source: Model output

The corporate tax that will be generated from the sector in the short term is minimal compared to the forgone GST and import duty. The margins for SAS operators are low – in this analysis modelled as a gross margin of 2 per cent - so the ability to raise corporation tax revenues from this margin is limited. The estimated corporation tax boost from maintaining the GST and import duty exemptions is only around USD 3,000 per year by 2025, although this should be seen as a lower bound, and the eventual aim of the sector should be to identify higher-margin customer segments.

Regarding job creation, if the GST and import duty exemptions are maintained, an additional 200 full-time jobs in the sector will be retained, compared to a circumstance where both GST and import duties are charged, and the sector shrinks. Apart from providing valuable livelihoods and skilled job opportunities, these jobs could also contribute about USD 1 million per year in income taxes and would offset the USD 64,000 in foregone GST and import duties by around USD 13,000 each year.

Figure 4: Income taxes gained from jobs in the SAS value chain

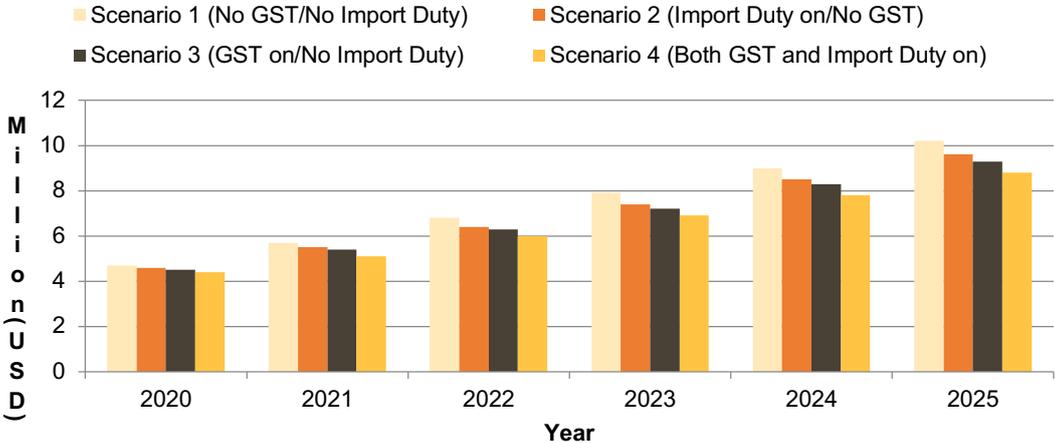


Source: Model output

In terms of increased socioeconomic activities, the SAS sub-sector generates employment opportunities and productive economic potential for households across the country. When SAS products are exempted from GST and duty, around 32,000 households will use their products to start new businesses or start a new job, falling to just 27,000 if GST and import duties are levied. These downstream jobs are vital, as they improve families and communities' economic welfare and independence, often in poor rural areas with limited opportunities to participate in valuable monetary activities.

The commercial benefit to livelihoods generated by the GST and import duty exemptions could amount to USD 1.5 million per year by 2025, completely offsetting the foregone tax revenues and providing a targeted and needed income boost to the households that need it the most.¹⁵ These benefits primarily impacted women and people in deprived communities. According to GOGLA 2020, women's productivity is another indirect benefit derived from the increased uptake of SAS and the sector's growth; of the jobs created by the SAS sector, 27 per cent of the positions were filled by women.¹⁶ Similarly, the primary beneficiaries of "downstream" users within the household are women, who gain improved access to information and communication technologies which empowers them to start home-based businesses- which would otherwise not be possible.

Figure 5: Economic boost for households under different tax scenarios



Source: Model output

Non-Fiscal Impacts

Besides the fiscal impacts, taxation policy changes have a significant impact on the non-fiscal aspects of the economy. Households will save resources spent on other energy sources. In Sierra Leone, the unelectrified population typically uses small diesel/gasoline gensets, battery-powered torches, and to a lesser extent, kerosene. Switching to SAS products would not wholly eliminate spending on these energy sources but should reduce spending on alternative sources by at least 70 per cent. These savings would amount to USD 12.1m per year by the end of 2025 and would be almost USD 2 million lower in the GST and import duty scenario.

Also, uptake of SAS products generated by the tax exemptions would also impact the environment and the level of CO2 emissions resulting from increased use of renewables. Increased uptake of SAS products due to removal of GST and duty would reduce carbon emissions by over 3,000 tonnes by the end of 2025, with a generated environmental benefit of USD 160,000.

The analysis also revealed that maintaining GST and duty would ideally result in a cumulative rise in study hours for children; as the number of children with access to light from solar energy is expected to increase from more

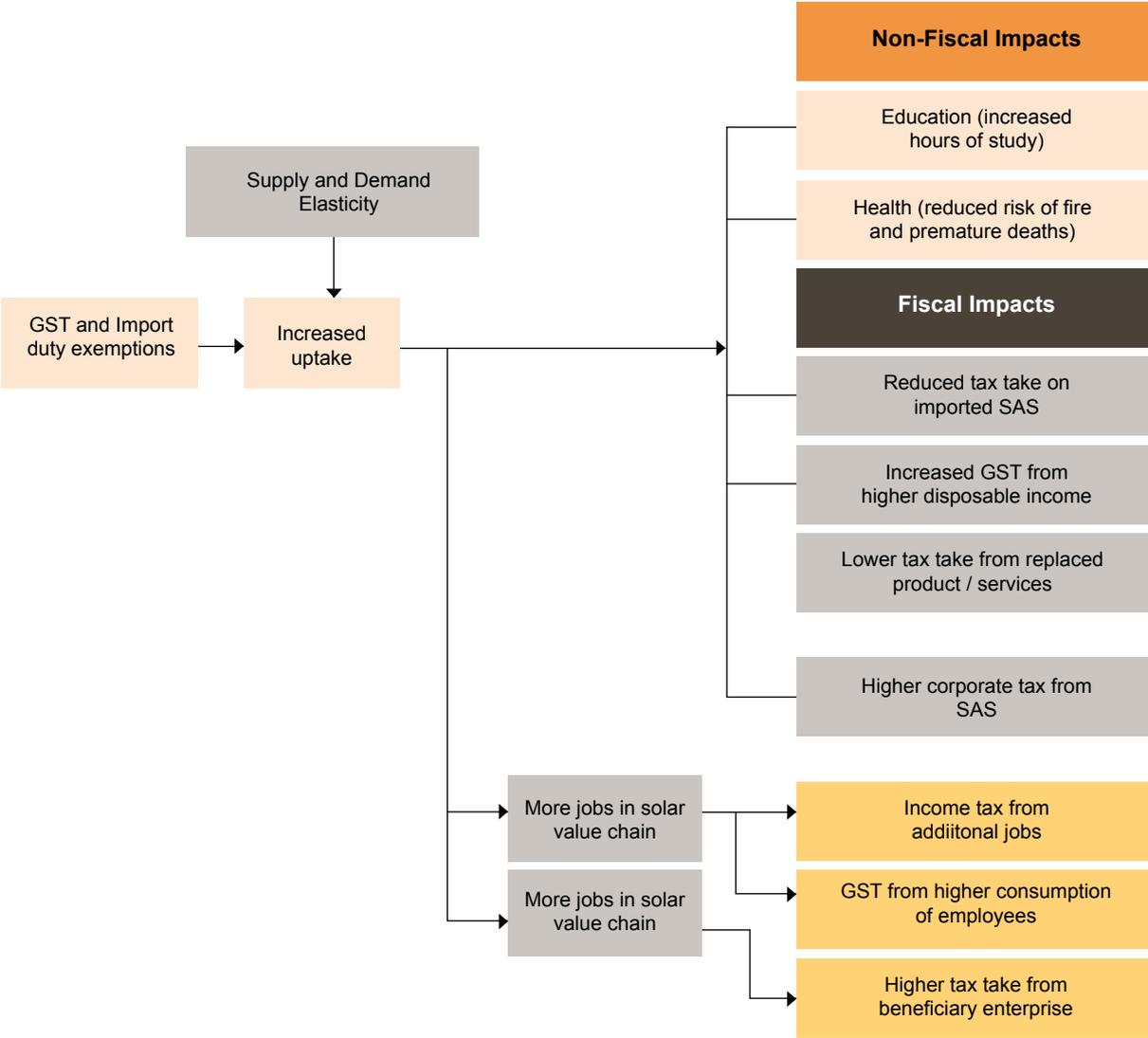
than 200,000 between 2016 and 2020 to nearly 400,000 between 2021 and 2025. There are also health benefits associated with the uptake of SAS products that come from the reduced risk of fire accidents from candles, kerosene and petrol for generators. Between 264- 300 premature fire-related deaths could be prevented yearly based on the National Fire Force estimates after further stakeholder engagements. The table shows the benefits from increased access to SAS products.

Table 2: Summary of benefits from an accelerated SAS products market

Component	Before 2016	2016 - 2020	2021- 2025 (projected)
Employees	50	945	1,718
Average annual revenue from GST and import duty	\$13,403	\$42,672 (2years of import duty+ 5 years of GST)	\$106,680
Percentage of households using SAS products	0.8%	6.6%	12.0%
Household savings from using SAS products	\$253,093	\$2,088,022	\$3,796,404
Income tax from SAS market employees (per annum)	\$15,000.00	\$283,500.00	\$515,400
Number of children with increased hours of study	25,210	208,802	379,640
Estimate of loss due to fire from using naked flames for lighting (property)	\$5.0m	\$4.7m	\$4.4m
Deaths due to fires from using naked flames for lighting (per annum)	300	283	264

The schematic diagram below illustrates the fiscal and non-fiscal benefits of GST exemptions and import duty on SAS products.

Figure 6: Schematic representation of cost and benefit modelled to assess the impact of tax exemptions



5. RECOMMENDATIONS AND ACTION PLAN

We identify five key recommendations to foster the development of the SAS sector to maximise the achievement of policy goals and benefits to households and communities. In terms of GST and import duty exemptions, there is a clear economic case for maintaining these exemptions, particularly at the relatively early stage of market development that characterises the market in Sierra Leone. Tax exemptions have played a key role in building SAS leading markets worldwide, such as Africa's leading SAS market in Kenya, and in supporting the deployment of the world's largest SHS program in Bangladesh. Exemptions help bring the price of SAS products within reach of what is typically a rural and low-income customer group and provides private sector project developers and investors with stability and an attractive environment in which to take on the risk of market entry and expanding their business models. From our engagement, it is clear, that tax exemptions coupled with a transparent and timely importation process are one of the major priorities for private sector operators.

Maintaining and enforcing the exemptions alone will not be enough to encourage rapid acceleration of deployment of SAS technologies and the realisation of national energy access targets. The remaining four recommendations below centre on complementary policy and regulation to ensure tax exemptions achieve their maximum potential. In particular, exemptions should support (and be supported by) clear and well understood quality standards – with awareness campaigns for households to ensure trust in the market and access only to high-quality SAS products. This will also require coordination and capacity building for key public sector agencies and improved public-private sector dialogue. Finally, while tax exemptions are an effective way of building the market nationwide, there will also be a need for targeted financing mechanisms to ensure that as product penetration increases, even the poorest, most vulnerable, and hardest to reach communities are not left behind.

The GST and import duty exemption policy align well with other government policies. It would help improve economic development, and many of the benefits (both fiscal and non-fiscal) could fall disproportionately to women and girls. When considered alongside the possible fiscal benefit, it is recommended that the government continue with the current tax regime on SAS products, but the policy should be closely monitored so that if it does not lead to the expected acceleration in SAS uptake (noting this may take a number of years), the policy can be reconsidered.

Five priority policy recommendations



Maintain both GST and import duty exemptions. The SAS sector is still growing into a vibrant private sector that can reach the poorest and most remote communities. Tax exemptions are a crucial part of a favourable enabling environment to help the market achieve scale, commercial viability and provide much needed access to energy and other services for households and small businesses.

The exemptions should be maintained with a clear process for periodic review. Stakeholders in the SAS market should continuously engage with Parliament to review the exemption policy as the country progresses closer to universal access and as companies achieve scale and begin to see stable profit margins. A clear framework such as periodic reviews would provide stability for investors and help coordination among public and private sector stakeholders.



Ensure exemptions are clearly tagged to quality-verified products to build consumer confidence. Low-quality products represent a dual risk as they both (1) undermine consumer confidence in SAS products and (2) reduce potential government revenue not only from GST and import duties but from corporation tax and income taxes that could be generated informal sector SAS value chains.

A clear list of quality-verified exempt products must be clearly articulated and maintained. The MoE should work with the Renewable Energy Association of Sierra Leone (REASL) to establish a clear and easy to understand list of products, equipment and appliances that qualify for exemptions. These should meet the relevant IEC quality standards.



Coordination and capacity building. Strengthen coordination among national and international partners involved in the SAS products market; REASL, GOGLA IFC Verasol and the Bureau of Standards should build synergy in the certification of SAS products to ensure that compliant products are imported and exempted from taxation. The Off-grid Working Group (OGWG) should strengthen coordination among stakeholders in the energy sector especially dealers and distributors SAS products to ensure that prices of SAS products are affordable and match with the exemptions.

Capacity building should also focus on enforcing quality standards. The Consumer Protection Agency should be engaged to discuss quality issues surrounding the importation of solar products. The capacity and capabilities of the Standards Bureau's should be supported to test and confirm the quality of SAS products to facilitate the importation process and ensure there is a robust legal framework and enforcement mechanism for exemptions granted to quality-verified products.



Consumer awareness-raising: The MoE, REASL, and partners should work to facilitate consumer education and awareness campaigns that will cement the household solar category as a superior and affordable alternative. Awareness of solar products and home systems is low, and quality perception is mixed. Both retailers and consumers have no way of judging quality or differentiating high-quality products from low-quality products.



Developing additional targeted financing mechanisms: While tax exemptions are a crucial part of enabling the SAS industry to scale up and develop commercial maturity, they alone will not be enough to reach all households. Targeted supply side and/or demand side subsidies should support access for those unable to bear the full cost of an entry level solar product, while companies may need further support in accessing international and local currency credit lines.

ANNEXE 1 - LIST OF INSTITUTIONS THAT PARTICIPATED IN THE TOOL DEVELOPMENT WORKSHOP

List of Stakeholders
Ministry of Energy
Ministry of Finance
Ministry of Planning and Economic Development
Ministry of Trade and Industry
National Revenue Authority
Sierra Leone Standards Bureau
Sierra Leone National Shipping Company
Renewable Energy Association of Sierra Leone
DFID
MCCU
UNOPS
World Bank
Easy Solar
Delins Enterprise

REFERENCES

Source	Title	Source type
ACE TAF	Sierra Leone Market Assessment	Assessment report
ACE TAF (2020)	Understanding Impact of Distribution Costs on Uptake of OGS in Select SSA Countries.	Research report
ACE TAF (2021)	Impact of Tax Incentives on Access to Stand-Alone Solar Policy recommendations from analysis in Malawi,Rwanda, and Sierra Leone.	Tax Study report
Energy Africa – Zambia (2018)	Technical Assistance to model and analys the economic effects of fiscal policy options for off-grid technologies in Zambia.	Final report
F. Larry Leistritz etal	Socioeconomic Impact Assessment Models	Article from the journal
International Renewable Agency (IRENA) Report (2014)	Socioeconomic Benefits of Solar and Wind Energy	Research report
Millennium Challenge Corporation (2018)	Willingness and Ability to Pay for Electricity Service	Survey report
Ministry of Finance and Economic Development	Finance Act of 2016	Government document
Ministry of Finance	Finance Act of 2021	Government document
Ministry of Energy (2020)	Financial Sustainability Plan for the Power Sector in Sierra Leone	Policy report
Ministry of Energy and Water Resources (2012)	Energy Situation in Sierra Leone	Assessment report
Statistics Sierra Leone (2019)	Sierra Leone 2018 Integrated Household Survey Report (2019)	Statistical Report
Statistics Sierra Leone (2015)	Sierra Leone 2015 Population and Housing Census Report	Statistical Report
United Nations Development Programme	National Energy Profile of Sierra Leone, 2012	Assessment report
United States Agency for International Development	Power Africa Fact Sheet	Energy Situation Report



ACE TAF PARTNERS INCLUDE:



STRATEGIC PARTNER:



Tetra Tech International Development

Fourth Floor, Prosperity House, Westlands Road |
PO Box 19084 – 00100 | Nairobi, Kenya.