Credit: Bryce Barnard of Prismatic Innovations for Scatec

AFRICA SOLAR OUTLOOK 2021

A COUNTRY-BY-COUNTRY REVIEW OF THE STATUS OF SOLAR IN AFRICA

FEBRUARY 2021

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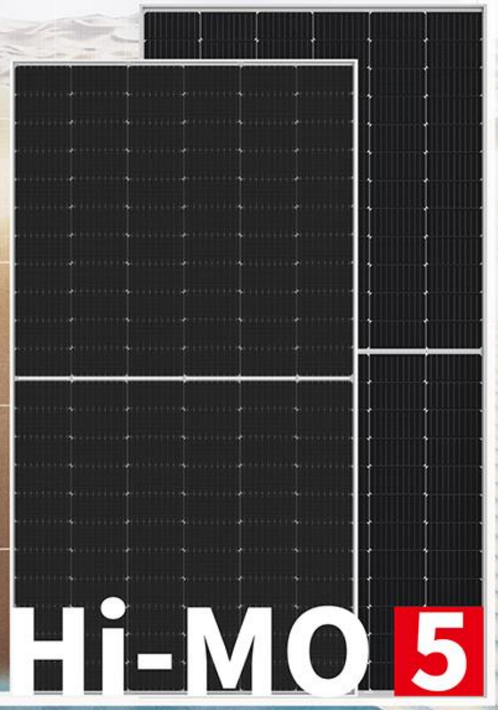

Hi-MO 5

Credit: Powerlive Zimbabwe and Azimut 360

A FEW WORDS OF GRATITUDE

This report is the fruit of a few months of intense teamwork and collaboration. I would like you to join me in thanking those who have made this report possible thanks to their great knowledge of the industry, their relentless work, and their attention to detail.

Special thanks go to AFSIA's very own Research Analyst Ines Rachel Dushime who has researched, collected, and compiled tons of data over the past few months to give the most complete and condensed info source about solar in Africa. In this ambitious endeavor, Ines was able to count on Micheline Thienpont for lending a hand on top of her many other responsibilities at AFSIA.

We also received the support of a team of individuals who are passionate about solar energy and who AFSIA is very lucky to have in their close circle. A massive thank you goes to Kevin Robinson from LONGi Solar, Adel Baba-Aissa from Renewable Energy Partner, Hery-Zo Rajaobelina from GC Solar, Sherif El Gabaly from Enara Capital and Dennis Akande from IRENA for their great contribution, insights, and support with this report.

Finally, I would also like to thank our partners who made it possible for AFSIA to dedicate resources to compile this report over the past few months. Many of them have been supporting AFSIA from Day 1 when AFSIA was just an idea on paper. AFSIA is very lucky to have your support and trust, and the entire team is very proud to be working with you every day to continue spreading the word about the benefits of solar across Africa. A big thank you to DuPont Photovoltaics, JA Solar, Jinko Solar, LONGi Solar, Renewable Energy Partner, Trina Solar, AMMP, GreenYellow and UL for their support with this report.

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FOREWORD

I am very pleased to share with you AFSIA's 1st Annual Solar Outlook for solar energy in Africa. The solar industry in Africa is truly booming thanks to new and more flexible technologies brought to market, but also thanks to drastic cost reductions of both solar panels and storage solutions. These new and improved technologies now make it possible to enjoy electricity reliably and affordably where it previously simply was not possible. And solar also offers a significant improvement in locations where the grid is present but is erratic or too expensive.

We are entering a decade of wonderful prospects for solar in Africa, a decade in which solar professionals are in a position to achieve universal electrification targets across the continent, thereby impacting the living conditions of 600 million people, and boost the continental economy by providing better and cheaper electricity to the companies and industries that have been asking for it for so long. This decade has already started and it promises to be a wonderful journey for the African solar industry.

Solar is no longer the energy of tomorrow, it is the energy of today!

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PRESENTATION OUTLINE

- A few words of gratitude
- Foreword
- Introduction
- Country-by-Country vignettes
- Booming C&I segment
- African petrol stations going solar
- MG receives a boost after challenging 2020
- Several African nations on the path to joining the Gigawatt Club
- SHS are no longer basic lighting systems
- AFSIA Members

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INTRODUCTION

This report is a country-by-country review of the key drivers for successful solar development. It aims at being the solar decision-maker companion by providing clear and concise information about the solar dynamics in each country.

In this report, we have opted for a very summarized presentation of these key drivers. But all elements presented are sourced and the reader can easily track the information and dig deeper wherever need be.

On top of the country vignettes, we have also gone deeper into some of the main segments which compose the solar industry: large-scale projects, C&I (commercial and industrial, often referred to “auto-consommation” in french), MGs (mini-grids) and SHS (solar Home Systems).

These segments reviews are only snapshots of their full status and latest developments. Indeed, the African continent is so vast and solar developments so numerous that it would not be possible to cover each segment comprehensively in 1 document. We thus opted for bringing the spotlight only on the most notable and trending aspects of each segment.

We hope you will enjoy AFSIA’s inaugural Annual Solar Outlook and look forward to your comments to make future reports better and more useful. Please do not hesitate to share your suggestions and remarks at info@afsiasolar.com so that we can continue building a strong and growing industry together.

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NAVIGATE THIS REPORT

COUNTRY VIGNETTES

SOLAR SEGMENTS REVIEW


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ALGERIA

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OBJECTIVES

- renewable energy development program of 22,000 MW by 2030, out of which 16,300 MWp of PV link
- abandon of 4,000 MWp Tafouk1 project by 2024 link

TOTAL PV / CSP INSTALLED

LARGE SCALE		343.1 MWp PV + 25 MWe CSP
C&I		11.7 MWp
MG		0 MWp
SHS & RESIDENTIAL		0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.001	$0.032	$0.032
MAX.	$0.041	$0.041	$0.041

source

POLICY / REGULATION

- 30% import duties on foreign solar panels
- no limit of self-consumption
- no FiT, no net-metering

ELECTRIFICATION RATE

- 99.8% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

- launch of 2 x 500 MWp tender in 2021 link

ANGOLA

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OBJECTIVES

- 9.9 GW of installed generation capacity by 2025, up from current 6.4 GW link
- 600 MWp through 30,000 MGs by 2022 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.004	$0.018	$0.015
MAX.	$0.022	$0.022	$0.020

source

POLICY / REGULATION

- in June 2019 grid electricity subsidies were cut by 85% link
- objective is to apply cost-reflective tariffs by 2025 link
- PV subject to import duties and VAT link
- no FiT, no net-metering
- no limit on self-consumption

ELECTRIFICATION RATE

- 36% of the population has access to electricity link
  43% in urban areas and 8% in rural areas link
- objective to reach 60% electrification rate by 2025 link

NOTEWORTHY DEVELOPMENTS

- MCA Group, Hitachi ABB Power Grids and Sun Africa to build 7 large-scale plants for total of 370MWp link

BENIN

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OBJECTIVES

- achieve 24.6 % of renewable energy in the energy mix by 2025 link

TOTAL PV INSTALLED

LARGE SCALE	5 MWp
C&I	0.2 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.160	$0.230	$0.150
MAX.	$0.280	$0.230	$0.310

source

POLICY / REGULATION

- all PV components, except inverters, are exempted from VAT on import link
- no net-metering and no limit on self-consumption link
- Universal Energy Facility managed by SEforALL offering RBF for mini-grid developers link

ELECTRIFICATION RATE

- 41.5% of the population has access to electricity, only 18.3% in rural areas link
- target to achieve urban and rural electrification rates of 95% and 65% by 2025 link

NOTEWORTHY DEVELOPMENTS

- 119 MGs operational and/or under construction link
- 2x10 MW + 2x15MW tendered in 2019 through MCA-Benin II link

BOTSWANA

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OBJECTIVES

- 1.5 GW new capacity to be added by 2040 link
- at least 15% renewable energy by 2030 link
- 135 MWp PV by 2022, up to 800 MWp by 2040 link
- 200 MW CSP by 2026 link

TOTAL PV INSTALLED

LARGE SCALE	1.3 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.086	$0.105	$0.071
MAX.	$0.120	$0.155	$0.079

source

POLICY / REGULATION

- FiT for residential and commercial installations for a total capacity of up to 10 MWp in 2021 link

ELECTRIFICATION RATE

- 60% electricity access on average throughout the country (77% in urban areas and 37% in rural areas) link
- Target to reach 100% electrification by 2030 link

NOTEWORTHY DEVELOPMENTS

- tender for 2x50 MWp ongoing link
- Giyani Metals eyes 14-60 MWp link
- launch of 200 MW CSP tender expected in 2021 link
- 4.5 GW PV + CSP initiative with Namibia launched link

BURKINA FASO

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OBJECTIVES

- reach 1,000 MW of installed capacity by 2022 link
- target of 50% Renewable Energy in the electric mix by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	33 MWp
C&I	15.5 MWp
MG	0 MWp
SHS & RESIDENTIAL	0.2 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.140	$0.140	$0.100
MAX.	$0.310	$0.310	$0.260

source

POLICY / REGULATION

- all PV components are exempted from import duties and VAT link
- no feed-in tariff, no net-metering

ELECTRIFICATION RATE

- 19% of the population has access to electricity link
- 60% in urban areas and 3% in rural areas link
- target to reach 95% electrification rate country-wide by 2030 link

NOTEWORTHY DEVELOPMENTS

- total of 250 MW of large-scale PV plants under construction and/or development
- Bouly & Bissa mine looking at 13 MW hybrid link
- Results-based financing program for 100 MGs announced link

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BURUNDI

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OBJECTIVES

- no specific target or concrete plan for the implementation of off-grid solar systems link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	data could not be verified		
MAX.			

POLICY / REGULATION

- PV components are not exempted from VAT

ELECTRIFICATION RATE

- 7% of the population has access to electricity link
- 49% of urban areas are connected to the grid, while only 1% of rural areas have grid access link

NOTEWORTHY DEVELOPMENTS

- 7.5 MWp under construction link
- 2x4.5 MWp hybrid under development link
- 13 MGs being developed by UNDP link

CAMEROON

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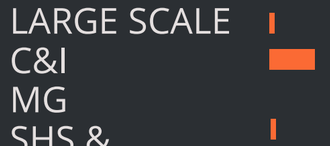
OBJECTIVES

- 25% RE in national mix by 2035 link
- electrify 660 localities by 2035, among other by using solar link

TOTAL PV INSTALLED



LARGE SCALE	0.1 MWp
C&I	2.3 MWp
MG	0 MWp
SHS & RESIDENTIAL	0.1 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.095	$0.160	$0.114
MAX.	$0.188	$0.188	$0.162

source

POLICY / REGULATION

- all PV components are subject to a 10% import tax but no VAT link
- FER (Rural Energy Fund) provides subsidies up to 80% of the feasibility and up to 70% of the infrastructure costs link
- no FiT, no net-metering

ELECTRIFICATION RATE

- according to WB, 91% of urban areas and 21% of rural areas are connected to the grid link
- target to achieve 75% country-wide electrification rate by 2030 link

NOTEWORTHY DEVELOPMENTS

- Maroua 15 MWp and Guider 10 MWp in late stage of development link
- 687 villages to be electrified with MGs link

CAPE VERDE

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OBJECTIVES

- original RE target of 100% by 2020 link
- target reviewed to 30% by 2025 and 50% by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	8.8 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.311	$0.349	$0.295
MAX.	$0.437	$0.416	$0.334

source

POLICY / REGULATION

- exemption of VAT on import for panels and batteries link
- no licence required below 100 kWp link
- net-metering for systems below 100 kWp link
- no FiT

ELECTRIFICATION RATE

- 92% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

- 2x5 MWp tender ongoing link

CENTRAL AFRICAN REPUBLIC

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OBJECTIVES

- no specific objectives

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.130	$0.061	$0.061
MAX.	$0.324	$0.085	$0.085

source

POLICY / REGULATION

- n/a

ELECTRIFICATION RATE

- 14% of the population has access to electricity, almost exclusively in capital city link
- target to connect 50% of the population by 2030 link

NOTEWORTHY DEVELOPMENTS

- n/a

CHAD

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OBJECTIVES

- the share of renewable energies to be increased to 20% of the energy mix by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0.6 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.158	$0.160	$0.160
MAX.	$0.382	$0.401	$0.380

source

POLICY / REGULATION

- all RE materials and equipment exempt from VAT link

ELECTRIFICATION RATE

- 8% of the population has access to electricity link
- increase of electricity coverage to 53% by 2030, with 20% electrification rate in rural areas link

NOTEWORTHY DEVELOPMENTS

- AMEA Power to build 120 MWp project link
- Aldwich progressing with Djermaya 60 MWp project link
- More developers announcing total of 800 MW developments
- UNDP to equip 150 health centers with solar link

COMOROS

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OBJECTIVES

• WB supporting “ComorSol“ strategy for the island’s utility company link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.300	$0.300	$0.300
MAX.	$0.345	$0.325	$0.325

source

POLICY / REGULATION

• all PV components exempted from import duty and taxes, including the single administrative fee link
• no net-metering and no FiT

ELECTRIFICATION RATE

• WB estimates 82% of the population has access to electricity link
• AfDB estimates only 8% of the population is serviced in the 3 islands link
• target of 100% electrification by 2033 link

NOTEWORTHY DEVELOPMENTS

• n/a

SEGMENT REVIEW: LARGE-SCALE

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Credit: Scatec Solar

SEGMENT REVIEW: LARGE-SCALE

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SEVERAL AFRICAN NATIONS ON PATH TO JOINING THE GIGAWATT CLUB

To date, close to 700 GW of PV has been installed worldwide. Some countries adopted solar sooner than others and already rely on large solar installed capacities after almost 15 years of installations being commissioned. Other countries were slower to embrace solar and be able to enjoy its benefits but they are rapidly catching up.

Overall, 37 countries across the world have already installed more than 1 GW of solar. The Gigawatt Club is the unofficial name of the group of countries that have passed the 1 GW mark.

Out of these 37, only 2 African countries are members of the Club (South Africa and Egypt). This is very little, but it may soon change as different African countries have developed a growing appetite for solar recently.

South Africa and Egypt, which are already in the Gigawatt Club, will continue their solar journey and add sizable capacities to their grid: South Africa is in the process of relaunching its very successful REIPPP program of the early 2010s and Egypt continues building on the great success of both government-led projects such as Benban and decentralized projects fueled by FiT.

And based on government and private developers' announcements, a group of 9 additional African countries could soon enter the Gigawatt Club.

One of the most expected countries is Algeria, with a 4 GW pipeline that has been announced

SEGMENT REVIEW: LARGE-SCALE

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for several years. With new institutions and officials in place, it is reasonable to expect that this plan (or part thereof) will finally be moving forward and will see the gas-rich country move very quickly with massive projects. The latest official announcements have however reduced the initial ambition to 1,000 MWp for 2021.

Neighboring Morocco, which has put in place a more transparent and efficient tender and development process over the years, has plans to add almost 2 GW of new projects in the coming years and has just entered a crucial stage of the Noor PV II – Phase 1 400 MW tender.

But what is maybe even more interesting is to see the ambitions and actions of countries that might not necessarily be the first in mind as “solar champions”. These countries include Zimbabwe, Zambia, DRC, Angola, Namibia, Ethiopia and Botswana.

SEGMENT REVIEW: LARGE-SCALE

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The motivation behind these ambitions differs from country to country.

Solar in Zimbabwe, for example, is mostly driven by the private sector which has been struggling for years with erratic power supply and grid shutdowns. The time has finally come for private players to take their faith into their own hands and several industrial groups are now planning sizable projects which will serve both their own consumption and the grid.

Ethiopia and Botswana on the other hand have followed a more traditional approach of international tenders and should reap the benefits of this approach through bottom-low tariffs, albeit after a relatively lengthy tendering process.

Zambia, DRC, and Angola have so far followed the opposite route: in these countries, the government has awarded private developers direct contracts for significant capacities without going through a tender. This approach has the benefit of speed but also involves significant project development and financing challenges. While close to 400 MW is already under construction in Angola, many industry specialists will keep a close eye on the 1 GW and 600 MW contracts that have been signed in DRC and Zambia respectively.

Finally, an international initiative will see Namibia and Botswana develop 5 GW of solar PV and CSP. This initiative is meant for both domestic consumption and export, and should see a group of 12 other countries join down the road.

SEGMENT REVIEW: LARGE-SCALE

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This positive trend could be accelerated even further thanks to two specific developments of the solar industry. These two developments are global, but they will express most of their positive impact in African nations.

The first development is the reduction in storage costs. Many grids in Africa are considered “weak” and have a limit as to the solar capacity they can absorb at any point across the national infrastructure (in most cases maximum 30MW). But by coupling solar and storage technologies, the technical limitation could be bypassed and significantly more solar capacity could be added and connected to the grid, thereby providing more electricity to consumers who are reached by the grid. West Africa is leading the charge in such large-scale solar+storage projects.

The second potential game-changer is hydrogen. Hydrogen holds many promises for a cleaner global future and “green hydrogen” (produced from renewable sources) is of course the most logical choice to make, as opposed to its “brown” and “blue” alternatives. Africa is ideally positioned thanks to its excellent irradiation to play a pivotal role in the global hydrogen market and also to have its local industry grow and develop on the backbone of a stable and local energy resource. All global energy leaders, and by extension solar companies, are already eyeing privileged partnerships in Africa’s sunniest regions. The future should tell us soon if the continent will become a global hub for production and export of solar-based green hydrogen.

COTE D'IVOIRE

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OBJECTIVES

• target to generate 42% of its electricity from renewable energy by 2030, non-hydro representing 16% link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0.4 MWp
MG	0 MWp
SHS & RESIDENTIAL	1.78 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.046	$0.165	$0.108
MAX.	$0.187	$0.193	$0.232

source

POLICY / REGULATION

• reduced VAT on PV components from 18% to 9% link
• no FiT
• no net-metering

ELECTRIFICATION RATE

• 64% of the population has access to electricity link
• 92% of urban population and 38% or rural population currently connected to the grid link

NOTEWORTHY DEVELOPMENTS

• 2x30 MW tender through IFC Scaling Solar link
• Dekel Agri-Vision considering a 30 MWp hybrid plant link

DEMOCRATIC REPUBLIC OF CONGO

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OBJECTIVES

• no official RE or solar objectives

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0.7 MWp
MG	2.4 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.027	$0.110	$0.044
MAX.	$0.087	$0.150	$0.098

source

POLICY / REGULATION

• exemption of import duty and VAT for generation equipment, but unclear if this applies to solar generation as well link
• by end of 2019, most solar off-grid companies were still paying import duties and VAT amounting to 35% link

ELECTRIFICATION RATE

• 8.7% of the population has access to electricity link
• target to electrify 65% by 2025

NOTEWORTHY DEVELOPMENTS

• Kinshasa Solar City to bring 1 GW of PV in 2 phases link
• Other projects announced totaling 580 MW
• Eranove to build 3 MGs in Bumba, Isiro and Gemena for total $110M link

DJIBOUTI

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OBJECTIVES

• mid 2019, the Minister of Energy announced a target of 100% RE by 2020 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.151	$0.252	$0.162
MAX.	$0.308	$0.308	$0.230

source

POLICY / REGULATION

N/A

ELECTRIFICATION RATE

• 42% of the population has access to electricity link
• 54% in urban areas, 1% in rural areas link

NOTEWORTHY DEVELOPMENTS

• Grand Bara 300 MWp project to be built in 2 phases of 30 MWp and 270 MWwp link
• Phase 1 to be built by Engie link

EGYPT

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OBJECTIVES

• 20% RE in energy mix by 2022 and 42% by 2035 link

TOTAL PV / CSP INSTALLED

LARGE SCALE	1,720 MWp (PV) + 20 Mwe (CSP)
C&I	38.5 MWp
MG	0.1 MWp
SHS & RESIDENTIAL	4.89 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.024	$0.042	$0.046
MAX.	$0.093	$0.102	$0.102

source

POLICY / REGULATION

• 2% customs duties for all equipment and machinery for RE link
• 30% deduction of the net taxable profits, free land for RE link
• FiT in place between 2014 and 2018 link
• net-metering with some requirements up to 20MW link

ELECTRIFICATION RATE

• 100% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

• AMEA Power increased Kom Ombo Project from to 200 to 500 MW link
• multiple C&I projects being undertaken among others installations at 65 NAC buildings for 18MW total link
• agriculture industry also starting solar projects, for ex. 17.5 MWp project for Dakahlia Group link

EQUATORIAL GUINEA

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OBJECTIVES

- no official RE program

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	5 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	data could not be verified		
MAX.			

POLICY / REGULATION

- no tax incentives
- state can authorize reduced rates or total VAT exemption depending on the nature of activities of investors link
- no FiT

ELECTRIFICATION RATE

- 67% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

- n/a

ERITREA

AFSIA
Africa Solar Industry Association

OBJECTIVES

• 15% RE in energy mix by 2020 and 50% by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	7.5 MWp
MG	2.3 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	data could not be verified		
MAX.			

POLICY / REGULATION

• no specific incentives for the energy sector
• no FiT

ELECTRIFICATION RATE

• 48.2% of the population has access to electricity link
• target to reach 15% of rural access to electricity by 2020, 100% by 2030 link
• electrifying 50 villages per year

NOTEWORTHY DEVELOPMENTS

• more than 70 MW large scale projects initiated by the Ministry of Energy and Mines link

ESWATINI

AFSIA
Africa Solar Industry Association

OBJECTIVES

- reduce dependency on electricity imports link
- RE to represent 40% of energy mix by 2020 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.071	$0.157	$0.063
MAX.	$0.117	$0.325	$0.319

source

POLICY / REGULATION

- no tax exemption for PV link

ELECTRIFICATION RATE

- 81% of the population has access to electricity link
- goal is to reach universal access by 2022 link

NOTEWORTHY DEVELOPMENTS

- 10 MWp Lavumisa project finishing construction link
- Swaziland Electricity Company developing new 40 MWp project link
- King Mswati III international airport soon getting 850 kWp link

ETHIOPIA

AFSIA
Africa Solar Industry Association

OBJECTIVES

- increase generating capacity by 25 000 MW by 2030: 22 000 MW of hydro; 1,000 MW of geothermal; and 2,000 MW of wind link
- mitigating GHG emissions by 64% by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0.4 MWp
SHS & RESIDENTIAL	0.1 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.007	$0.035	$0.016
MAX.	$0.040	$0.035	$0.026

source

POLICY / REGULATION

- PV and off-grid lighting exempt from import duty link
- PV and off-grid lighting subject to VAT link
- new set of laws governing off-grid generators & distributors link
- no FiT (evaluation conducted in 2015) link

ELECTRIFICATION RATE

- 40% of the population has access to electricity link
- goal is to provide electricity access to all by 2025, with 35% off-grid and 65% grid link
- reach 96% grid connections by 2030 link

NOTEWORTHY DEVELOPMENTS

- 1,330 MWp at different stages of development through Scaling Solar Program link
- 62 MG under construction and/or development throughout the country link
- 10 universities to get 10 MW each link

SEGMENT REVIEW: SHS

AFSIA
Africa Solar Industry Association

SHS ARE NO LONGER BASIC LIGHTING SYSTEMS

Solar Home Systems (SHS) are inextricably linked with Africa and vice versa. These ingenious systems have changed the lives of millions of Africans, allowing them to get access to basic services and comfort even though they live in remote areas that are not served by the national grid.

Contrarily to grid electricity, SHS and their accompanying appliances function on DC (direct current) and are therefore often considered as providing sub-par electricity quality and service.

While this might have been true in the early days of SHS, significant progress has been made on improving the quality of the components and service, but also on the diversification of applications and appliances that can be connected to SHS systems. SHS manufacturers are nowadays offering a wide spectrum of products ranging from 5W to 1kW and providing power to a wide range of needs across the continent.

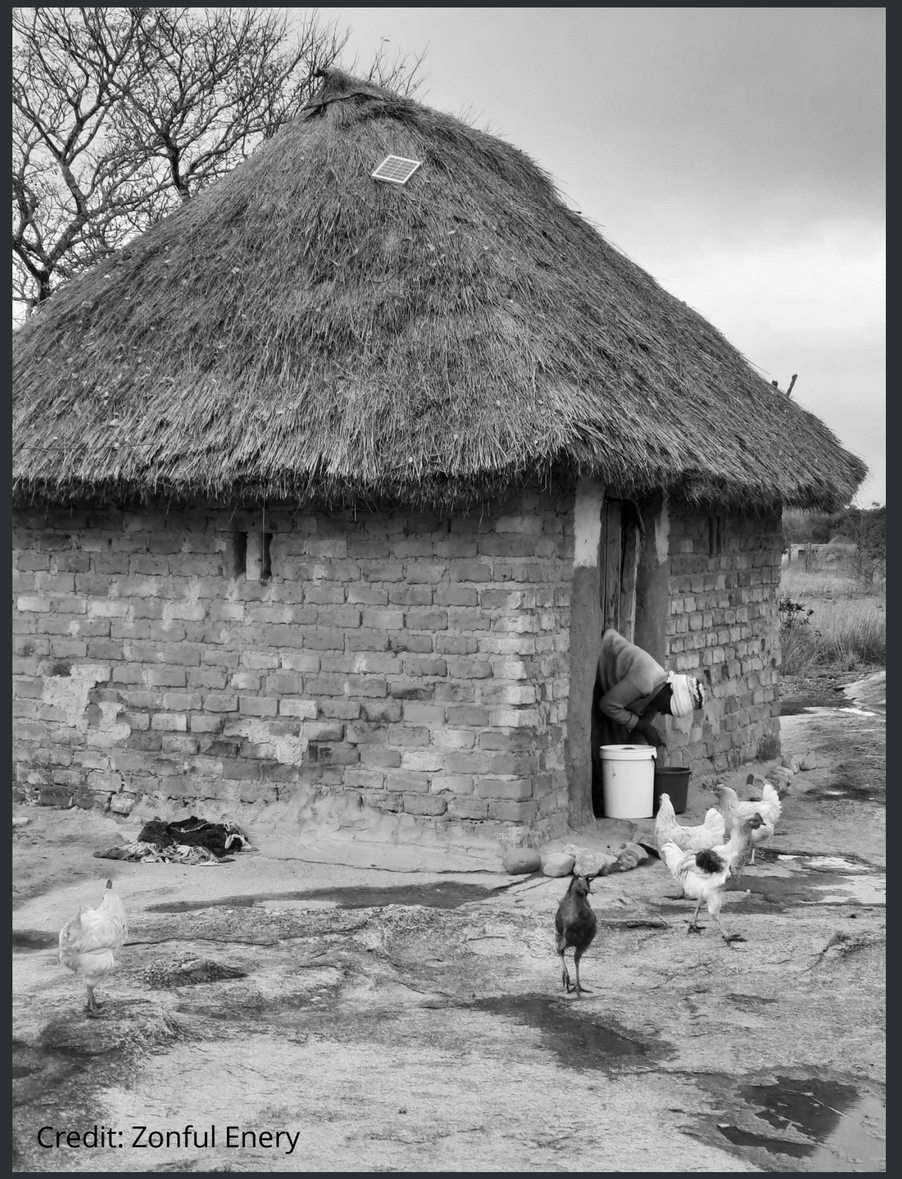
One of the best examples of this evolution are the solutions which can be provided to healthcare facilities. It is estimated that the continent counts around 100,000 healthcare facilities. About half of these are located in rural areas, providing primary health services which include maternity and vaccination.

SEGMENT REVIEW: SHS

AFSIA
Africa Solar Industry Association

For these 2 life-essential medical activities, SHS can actually provide the perfect solution both technically and commercially. Complete kits including lights, vaccine fridges, medical equipment, and communication devices, all functioning on DC power, can now be connected to a simple 300W SHS system and cost less than $1,000. An equivalent AC-based system, for exactly the same final use, costs between 3 and 5 times more. In times of COVID pandemic, everybody understands the importance of basic power supply in the most remote medical facilities. Yet funds are limited and it is a challenge to equip all African medical centers in very short time.

It is our hope however that decision-makers reading this article will understand that they could be equipping up to 5 times more facilities with the same budgets if they were to make the SHS choice for primary healthcare facilities electrification.



Credit: Zonful Enery

GABON

AFSIA
Africa Solar Industry Association

OBJECTIVES

• 80% RE in national energy mix by 2020 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0.2 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.105	$0.163	$0.163
MAX.	$0.260	$0.280	$0.203

source

POLICY / REGULATION

• all PV components are subject to regular import duties and VAT link

ELECTRIFICATION RATE

• 86% of the population has access to electricity link
• targets to provide electricity for 85% of rural areas by 2025 link

NOTEWORTHY DEVELOPMENTS

• AUSAR Energy finishing construction of 8 MG for 2.8MW total capacity link

GAMBIA

AFSIA
Africa Solar Industry Association

OBJECTIVES

• give access to electricity to 30% of the rural population by 2030 by relying on off-grid electrification solutions such as domestic installations and mini-grids link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0.6 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.173	$0.173	$0.173
MAX.	$0.198	$0.198	$0.198

source

POLICY / REGULATION

• investment enterprise within priority categories is granted import VAT waiver link
• research conducted on the benefits of FiT and net-metering but no policy in place link

ELECTRIFICATION RATE

• 48% of the population has access to electricity link
• 69% in urban areas and 16% in rural areas link

NOTEWORTHY DEVELOPMENTS

• government developing the 150 MW / 1500 MWh Soma project link
• UNDP World Bank and EIB developing 30+ MW of large scale project link

GHANA

AFSIA
Africa Solar Industry Association

OBJECTIVES

• goal to reach a 10% contribution of RE in the electricity generation mix by 2020 link

TOTAL PV INSTALLED

LARGE SCALE	54 MWp
C&I	11 MWp
MG	0 MWp
SHS & RESIDENTIAL	0.35 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.055	$0.136	$0.135
MAX.	$0.160	$0.228	$0.449

source

POLICY / REGULATION

• PV panels are exempted from import duties and VAT link
• other PV plant components are exempt of import duty but subject to VAT link
• FiT for large-scale plants exists ($11.58/kWh since 2016) but is not being applied link

ELECTRIFICATION RATE

• 86% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

• 245 MW floating solar at Bui dam still to be built link
• Kotoka international airport planning 6 MW C&I project link
• PEG Africa to electrify 91 health centers with Power Africa's support link

GUINEA

AFSIA
Africa Solar Industry Association

OBJECTIVES

• quadruple installed capacity from 658MW to 2,600MW by 2025 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0.8 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.009	$0.097	$0.151
MAX.	$0.028	$0.151	$0.151

source

POLICY / REGULATION

• tax exemptions vary between projects link
• no regulatory framework developed for PV, financial support through subsidies link

ELECTRIFICATION RATE

• 35% of the population has access to electricity link
• target was to achieve 35% electrification by 2020 link
• target is to achieve 100% electrification by 2030 link

NOTEWORTHY DEVELOPMENTS

• 33 MW at Lefa mine developed by Norgold link
• more than 200 MW large scale projects under development by various companies

GUINEA BISSAU

AFSIA
Africa Solar Industry Association

OBJECTIVES

• no specific RE target but desire to reduce dependence on fossil fuels and conduct energy transformation by 2030 through link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0.3 MWp
SHS & RESIDENTIAL	0.25 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	data could not be verified		
MAX.			

POLICY / REGULATION

• solar panels are exempted from VAT but other components of a solar kit are not link

• no FiT, no net-metering policy

ELECTRIFICATION RATE

• 26% of the population has access to electricity link

• target to have 72% of the population gain access to the electricity grid by 2030 link

NOTEWORTHY DEVELOPMENTS

• 22 MW across 3 projects under construction developed by ABREC link

KENYA

AFSIA
Africa Solar Industry Association

OBJECTIVES

- in 2018, the target was to achieve a 100% green energy mix by 2020 link
- in 2020, the target is to achieve a 100% green energy mix by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	55.6 MWp
C&I	27.6 MWp
MG	2.3 MWp
SHS & RESIDENTIAL	16.18 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.135	$0.113	$0.113
MAX.	$0.177	$0.175	$0.175

source

POLICY / REGULATION

- all PV equipment and batteries subject to 14% VAT link
- FiT is $0.12/kWh bu registration procedures are complex link
- net-metering could be launched in the near future link

ELECTRIFICATION RATE

- 75% of the population has access to electricity link
- target to reach universal access by 2022 link

NOTEWORTHY DEVELOPMENTS

- 30 MW Tatu City industrial zone development link
- Multiple large scale projects at different stages of development

LESOTHO

AFSIA
Africa Solar Industry Association

OBJECTIVES

- additional renewable energy generation capacity of 200 MW by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.052	$0.018	$0.018
MAX.	$0.105	$0.118	$0.020

source

POLICY / REGULATION

- all PV components subject to a reduced VAT rate of 5% link
- net-metering for systems below 500kW link
- FiT for systems above 500 kW, to be negotiated link

ELECTRIFICATION RATE

- 37% of the population has access to electricity link
- achieve 75% household electrification by 2030 link

NOTEWORTHY DEVELOPMENTS

- Mafeteng 30 MW phase 1 under construction and 40 MW phase 2 scheduled link
- OnePower developing 10 MG with REPP's support link
- OnePower electrifying 7 healthcare centers through Power Africa grants link

LIBERIA

AFSIA
Africa Solar Industry Association

OBJECTIVES

- no RE target
- most focus on increasing the electricity access rate in rural areas

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0.1 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.390	$0.390	$0.390
MAX.	$0.390	$0.390	$0.390

source

POLICY / REGULATION

- Solar companies registered under LIRENAP are eligible for a duty reduction link
- RREA looking to create permanent duty waiver for all quality-verified solar products link

ELECTRIFICATION RATE

- 22% of the national population has access to electricity link
- target to reach 20% electrification outside of Monrovia by 2025 link
- target to reach 35% electrification outside of Monrovia by 2030 link

NOTEWORTHY DEVELOPMENTS

- 20 MW mount coffee Liberia large scale project under development by GigaWatt Global link
- Orange telecom towers to be solarized through Escotel link
- UNDP solarizing 12 health centers through MG link

LIBYA

AFSIA
Africa Solar Industry Association

OBJECTIVES

• government launches a National Plan for Developing RE (2013-2025) link

• achieve 10% renewable contribution to the electricity mix by 2025, with 400 MW CSP, 800 MW PV and 450 MW solar water heating link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	5 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.046	$0.156	$0.071
MAX.	$0.115	$0.156	$0.097

source

POLICY / REGULATION

• all PV components are subject to 4% port services tax (no import duty) link

• there is no VAT in Libya link

• no net-metering, no FiT

ELECTRIFICATION RATE

• 70% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

• construction of 100 MW Kufra solar plant link

MADAGASCAR

AFSIA
Africa Solar Industry Association

OBJECTIVES

- double total installed capacity to reach 800 MW by 2023 link
- RE to represent 85% of energy mix by 2030 link
- solar to represent 5% of energy mix by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	24.3 MWp
C&I	13.1 MWp
MG	0.2 MWp
SHS & RESIDENTIAL	1.78 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.037	$0.043	$0.023
MAX.	$0.236	$0.308	$0.282

source

POLICY / REGULATION

- no import duties and no VAT on solar panels and lithium batteries link
- other equipment subject to 20% import duties and 20% VAT link
- no net-metering, no FiT link

ELECTRIFICATION RATE

- 15 % of the population has access to electricity link
- target to connect 70% of the population by 2030 link

NOTEWORTHY DEVELOPMENTS

- Filatex to develop a 170 MW total capacity link
- ANKA Madagascar rolling out 60 MG link

MALAWI

AFSIA
Africa Solar Industry Association

OBJECTIVES

• no specific RE or solar targets

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	1.1 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.054	$0.124	$0.052
MAX.	$0.125	$0.143	$0.161

source

POLICY / REGULATION

• solar lighting products exempt from import duty link
• 0% VAT on all solar product and components link
• FiT available since 2012 for projects between 500 kW and 10 MW at $0.10/kWh without storage and $0.20/kWh with storage but no single project using FiT yet link

ELECTRIFICATION RATE

• 39% of the population has access to electricity link
• target to increase electricity access rate to 80% by 2035 link

NOTEWORTHY DEVELOPMENTS

• JCM Power finishing construction on 75 MW Salima project link
• Phanes Group starting work on 37 MWac Nkhotakota project link
• Resolve Capacity electrifying 85 health care facilities link

SEGMENT REVIEW: C&I

BOOMING C&I SEGMENT

AFSIA has been tracking solar projects in Africa for several years and conducts a daily surveillance of new projects being announced, awarded and commissioned.

So far we have identified more than 6,200 large-scale, C&I and mini-grid project across the continent. Out of these 6,200, 2,400 are already in operation and are composed by C&I projects for more than 80%!

Not so long ago, the solar market was naturally dominated by large-scale projects which have been developed and built in a handful of countries across the continent.

SEGMENT REVIEW: C&I

AFSIA
Africa Solar Industry Association

C&I was already a reality, but represented a very small MWp capacity within the African total.
But the market is clearly changing as C&I projects are now receiving a growing interest. Based on data collected by AFSIA, C&I could indeed represent 30-40% of all solar capacities installed in the coming years.
C&I catching the lion's share of the number of solar projects in Africa is not a surprise though. Three main reasons are driving this evolution.
First, more and more C&I end-users are now fully understanding the benefits of going solar. C&I end-users are by nature more acquainted with financial models, cost-benefit analysis, and long-term projections than residential end-users or public servants. While it may have taken them some time to trust the quality of solar solutions, most of the C&I community is now educated about the benefits of solar energy and wants to jump on the bandwagon so they can enjoy cheaper and more reliable electricity to run their business.
But until now, the wide majority of these C&I projects has been delivered on a CAPEX basis, meaning that the end-user has had to pay the full amount upfront for the solar installation. This has definitely limited the number of projects that have been built so far as only a small percentage of companies possesses the required cash to make such an upfront investment,

SEGMENT REVIEW: C&I

Credit: CrossBoundary Energy

literally to purchase 25 years worth of solar electricity in 1 go.

Luckily, the international investment community has understood the opportunity as well and has developed a growing appetite for investments in C&I projects in Africa. This is the second driver of the African C&I boom.

African C&I projects are indeed considered as attractive investment opportunities as they are based on B2B negotiations (as opposed to B2G), they can be conducted and successfully closed quickly (faster than the lengthy government tenders) and they can offer interesting IRRs (as opposed to international tenders for large-scale projects where the international competition pushes IRR expectations to their lowest limits).

SEGMENT REVIEW: C&I

AFSIA
Africa Solar Industry Association

For all these reasons, C&I opportunities are generally considered as good and attractive deals. But their scattered nature and significantly lower ticket size per project may play against them from an investor's point of view. This is where the 3rd main driver kicks in.

The challenge with financed C&I is to generate large enough portfolios of projects to attract investment partners. No matter how good the project is, it can be extremely difficult (if not impossible) to finance a single project because investors are looking for scale and being able to deploy large ticket sizes.

This is now growingly made possible thanks to the rise of a group of continental C&I development champions such as Daystar Power, Starsight, DPA, or Total to name a few. These companies all have already delivered 100s of C&I sites across the continent and have put in place processes that allow for faster and more efficient roll-out of C&I projects.

The financing deals announcements of some of these companies in early 2021 are very logical and announce an exponential growth not only of these project developers, but of the entire C&I segment.

SEGMENT REVIEW: C&I

AFRICAN SERVICE STATIONS GOING SOLAR

2020 has witnessed a real boom of hundreds of petrol stations across Africa going solar. The most notable push came from Total, the French O&G giant, which to date has solarized 540 petrol stations across 27 African countries (albeit relatively silently and without attracting too much attention). But this is a considerable achievement as it makes Total the de facto African leader in C&I development when looking at the total number of projects delivered.

Next to Total, the Zimbabwean Zuva Petroleum has also opted to solarize its gas stations and has planned to install PV and storage at 180 of its service stations across the country.

SEGMENT REVIEW: C&I

Other more isolated examples have also popped all across the continent.
We have identified some solar gas stations in Morocco, in Namibia with the PUMA service station in Windhoek, the Oniru station in Nigeria, the OK Express station in Wellington, South Africa, or also in DRC with the Ihusi station getting a hybrid system developed and installed by 2 AFSIA members.
In total, AFSIA has thus far identified 734 service stations across 29 countries that are now running partially or fully on solar energy. The motivation behind this move in almost all cases is cost savings. The fact that the service stations are have access to stable grid or not does not make a big difference for the service station operator.

In case of unstable grid, they more than anyone else would have easy access to diesel to run generators.
But with or without stable grid, they opt for solar as it now offers lower power costs. Quite an interesting turn of event to say the least!

Credit: AZIMUT 360

MALI

AFSIA
Africa Solar Industry Association

OBJECTIVES

- increase installed renewables capacity to 1.42 GW by 2030, with more than 600 MW off-grid link
- increase share of RE in electricity mix to 25% by 2033 link

TOTAL PV INSTALLED

LARGE SCALE	70 MWp
C&I	0.9 MWp
MG	1.8 MWp
SHS & RESIDENTIAL	0.65 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.112	$0.245	$0.173
MAX.	$0.298	$0.327	$0.253

source

POLICY / REGULATION

- all PV components are exempted from import duty and VAT link
- no net-metering, no FiT

ELECTRIFICATION RATE

- 27% of the population has access to electricity link
- target to add a 61% rural electrification link

NOTEWORTHY DEVELOPMENTS

- Scatec building 33 MWp Segou plant link
- 70+ MW for mining activity under construction or development
- Green Climate Fund financing 70 MG link

MAURITANIA

AFSIA
Africa Solar Industry Association

OBJECTIVES

- 20% RE by 2020 link
- 35% RE by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	19.3 MWp
C&I	0 MWp
MG	16.6 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.083	$0.083	$0.072
MAX.	$0.159	$0.159	$0.104

source

POLICY / REGULATION

- professionals said to import solar equipment with exemption for import duties and taxes, but no official document to be found link
- ADER provides subsidies of 60-80% for some of the isolated grids link

ELECTRIFICATION RATE

- 29% of the population has access to electricity link
- target to increase access rate to 95% in urban areas and 40% in rural areas, reach national electrification rate of 70% by 2030 link

NOTEWORTHY DEVELOPMENTS

- 1.4 MW / 4 MWh MG under development in Ndiago

MAURITIUS

AFSIA
Africa Solar Industry Association

OBJECTIVES

• government plans to increase use of RE for electricity generation from 22% to 40% by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	69.5 MWp
C&I	2.1 MWp
MG	0 MWp
SHS & RESIDENTIAL	7 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.055	$0.074	$0.054
MAX.	$0.219	$0.250	$0.135

source

POLICY / REGULATION

• several tax incentives for solar investment link
• Net-metering for residential customers for installations not exceeding 5 kWp link
• Prosumers registered under the CEB net-metering scheme get FiT (scheme closed in 2015 after target was reached) link
• Green energy scheme for SMEs: 2,000 2 kWp systems installed free of charge link

ELECTRIFICATION RATE

• 99% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

• 17 MWp Henrietta project under construction link

MOROCCO

AFSIA
Africa Solar Industry Association

OBJECTIVES

• RE to represent 50% of energy mix by 2030 and 100% by 2050 link
Addition of 4,560 MW of solar by 2030 link

TOTAL PV / CSP INSTALLED

LARGE SCALE	322 MWp (PV) + 510 MWe (CSP)
C&I	4 MWp
MG	0 MWp
SHS & RESIDENTIAL	15,86 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.099	$0.066	$0.067
MAX.	$0.176	$0.267	$0.322

source

POLICY / REGULATION

• PV equipment subject to 30% import duties (maybe 40% in near future) link
• solar pumps for agriculture are exempt from import duties link
• law 54-14 allow for self-consumption: up to 2 MW only requires a declaration, above 2 MW requires permit
• laws 13-09 allow for corporate PPAs
• FiT technically allowed by price not determined yet

ELECTRIFICATION RATE

• 99% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

• launch of 400 MW Noor PV II – Phase 1 tender link
• 600 MWp + 200 MWe Noor Midelt II tender in preparation link
• opening of 13-09 and 54-14 to MV customers expected to give a boost to PV projects

MOZAMBIQUE

AFSIA
Africa Solar Industry Association

OBJECTIVES

- increase installed capacity to 3,138 MW by 2022 and 4,163 MW by 2030 link
- for solar, Mocuba 40MW and Metoro 30 MW are Priority Generation Projects link

TOTAL PV INSTALLED

LARGE SCALE	40 MWp
C&I	0.1 MWp
MG	0 MWp
SHS & RESIDENTIAL	0.1 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.014	$0.053	$0.033
MAX.	$0.128	$0.209	$0.061

source

POLICY / REGULATION

- PV equipment subject to import duties and VAT but work ongoing to create exemption link
- FiT available since 2014 but no success thus far link

ELECTRIFICATION RATE

- 41% of the population has access to electricity link
- target to reach 50% of the population with the grid by 2023 link

NOTEWORTHY DEVELOPMENTS

- 41 MW Metoro project under construction link
- 340 MW of large scale projects being tendered
- Balama graphite mine planning 26 MW + 8.5 MWh C&I project link

NAMIBIA

AFSIA
Africa Solar Industry Association

OBJECTIVES

• RE to represent 70% of country's energy mix by 2030, reducing GHG emissions by 89% compared to 2010 link

TOTAL PV INSTALLED

LARGE SCALE	178.7 MWp
C&I	28 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.096	$0.079	$0.075
MAX.	$0.157	$0.216	$0.170

source

POLICY / REGULATION

• VAT is applicable to all imports of solar energy products in Namibia. Imports of these products from other SACU member countries will be free of customs duties in terms of the SACU Agreement, but not free of import VAT. link
Net-metering in place since 2017 for residential and C&I installations below 500 kWp link
• no FiT

ELECTRIFICATION RATE

• 51% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

• 4.5 GW PV + CSP initiative with Botswana launched link
• Groot Glass planning for 80 MW project in Tses link
• 2x40 MW tender by NamPower ongoing link

NIGER

AFSIA
Africa Solar Industry Association

OBJECTIVES

- RE to reach 57% of the electricity mix link
- Deployment of 100 MW of solar by 2021 link

TOTAL PV INSTALLED

LARGE SCALE	7 MWp
C&I	0.1 MWp
MG	0.1 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.130	data could not be verified	
MAX.	$0.242		

source

POLICY / REGULATION

- all RE components are exempt from import duties and VAT link

ELECTRIFICATION RATE

- 26% of the population has access to electricity link
- target to electrify 60% of the population by 2027 link
- achieve 30% electrification rate in rural areas by 2030 link
- achieve universal electrification by 2035 link

NOTEWORTHY DEVELOPMENTS

- 150 MW being developed by West African Power Pool link
- Sterling & Wilson building 18.9 MW + 11.5 MWh Agadez hybrid link

NIGERIA

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Africa Solar Industry Association

OBJECTIVES

- RE to represent 23% of generation by 2025 and 36% by 2030 link
- this means RE would represent 10% of consumption by 2025 link
- 500 MW of PV by 2025 link

TOTAL PV INSTALLED

LARGE SCALE	8.3 MWp
C&I	55.2 MWp
MG	1.6 MWp
SHS & RESIDENTIAL	11.92 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.065	$0.100	$0.148
MAX.	$0.128	$0.140	$0.148

source

POLICY / REGULATION

- 5% import duty and 5% VAT on PV components link
- Solar Nigeria Programme (NSP) supporting the market for off-grid solar link

$350M program to support mini-grid and SHS development link

- FiT for projects up to 5 MW link
- Net-metering for projects below 1MW link

ELECTRIFICATION RATE

- 84% of the urban population and 41% of the rural population has access to electricity for a national average at 60% link
- target to increase electricity access to 75% (urban= 90%, and rural= 60%) by 2020 and to 90% by 2030 link

NOTEWORTHY DEVELOPMENTS

- Katsina State looking to generate 600 MW link
- GVE building 72 MG financed by REPP link
- 400 MG being developed or built through different programs

REPUBLIC OF THE CONGO

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Africa Solar Industry Association

OBJECTIVES

• Congo Energy Strategy 2015-2025 aimed at developing a PV electrification plan for remote villages link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.070	$0.070	$0.057
MAX.	$0.110	$0.110	$0.064

source

POLICY / REGULATION

• all RE components are subject to import duties and VAT link
• country has no implemented legislation intended to incentivize the development of renewable energy projects link

ELECTRIFICATION RATE

• 17% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

• Local company Copasol working on 40 MW large scale project with US Ultra Green Corp link

RWANDA

AFSIA
Africa Solar Industry Association

OBJECTIVES

- Rwanda eyes to reach 512MW of total installed capacity by 2024 link
- no specific mention of the share of solar in this capacity

TOTAL PV INSTALLED

LARGE SCALE	8.8 MWp
C&I	4.9 MWp
MG	0.3 MWp
SHS & RESIDENTIAL	16.99 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.105	$0.185	$0.111
MAX.	$0.294	$0.301	$0.178

source

POLICY / REGULATION

- all PV components are exempted from VAT link
- $15M subsidy + $20M guarantee program for SHS launched in 2020 link
- no permit required for systems <50kWp
- no net-metering and no FiT

ELECTRIFICATION RATE

- 56.7% of the population has access to electricity link
- 41.3% are connected to the grid and 15.4% have access through off-grid systems (mainly solar) link
- target to reach 100% electrification by 2024 link.

NOTEWORTHY DEVELOPMENTS

- CrossBoundary planning 1 MW at Heineken brewery link
- ARC Power planning to facilitate 20,000 connections though solar business parks link

SAO TOME & PRINCIPE

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Africa Solar Industry Association

OBJECTIVES

• increase RE in national energy mix to 47% by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	data could not be verified		
MAX.			

POLICY / REGULATION

• solar equipment subject to regular import duties and VAT
no net-metering, no FIT

ELECTRIFICATION RATE

• 71% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

• CISAN developing a hybrid 15 MWp / 2 MWh project on Sao Tome island link
• EDP Renewables planning 4.75 MWp / 3.5 MWh project on Principe island link
• 34 MW additional total capacity being developed by various companies

SENEGAL

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OBJECTIVES

- 30% RE contribution in energy mix by 2025 link
- 100% solar mini-grids in 1,000 villages in Senegal by 2025 link

TOTAL PV INSTALLED

LARGE SCALE		171.5 MWp
C&I		9 MWp
MG		0 MWp
SHS & RESIDENTIAL		0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.173	$0.271	$0.112
MAX.	$0.254	$0.346	$0.370

source

POLICY / REGULATION

- all RE components are exempted from VAT link
- hybrid form of net-metering and FiT introduced in 2018 link

ELECTRIFICATION RATE

- 69% of the population has access to electricity link
- objective of 100% electricity coverage by 2025 link
- connection of at least 90% of rural households by 2025

NOTEWORTHY DEVELOPMENTS

- 102 MW under construction link
- tender launched for 133 MG link

SEYCHELLES

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Africa Solar Industry Association

OBJECTIVES

• 5% RE in the energy mix by 2020 and 15% by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	41.4 MWp
C&I	0.8 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.060	$0.162	$0.162
MAX.	$0.200	$0.206	$0.206

source

POLICY / REGULATION

• all RE components are exempted from Goods and Service tax link
• SEEREP provides loan facility open to households to acquire solar systems link
• rebate scheme residential and small commercial installations link
• net-metering for residential and commercial users since 2013 link

ELECTRIFICATION RATE

• 100% of the urban areas but less than 20% of rural areas are connected to the grid link

NOTEWORTHY DEVELOPMENTS

• construction of 5.8 MW floating solar project on hold due to COVID link
• 5 MW / 3.3 MWh Romainville MG under construction link

SEGMENT REVIEW: MG

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Credit: Africa GreenTec

SEGMENT REVIEW: MG

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MG RECEIVE A BOOST AFTER CHALLENGING 2020

Out of a population of 1.3B, the African continent stills counts an estimated 600M of people who do not have access to electricity. Efforts are being done in most countries to solve this issue and 3 solutions are possible: extending the traditional grid, providing stand-alone solar home systems (SHS), and building mini-grids (MG). These 3 options all have pros and cons but one thing is for sure: if Africa is to reach universal electrification, the solution will inevitably need to be based on a mix of these 3 electrification solutions. And mini-grids are believed to be the cheapest electrification option for 100 million people in Africa.

In 2020, the COVID crisis affected MG developers and projects more than any other segment of the solar industry. Indeed, MG development requires more work in the field, more logistics, access to more remote areas, and direct contact with the population, all of which were made particularly difficult with COVID and the associated movement restrictions. As a result, many MG projects which were under development or going through a tender phase were slowed down or completely put on hold. It is fair to say that 2020 was not a great year for the mini-grid sector.

SEGMENT REVIEW: MG

CREDIT: ARESS Group - Yannick Folly

But 2021 looks significantly more promising and should see some interesting developments once the effects and limitations of COVID become more manageable.

Several tenders are indeed continuing their path, while others have been announced recently. Among the most notable MG efforts on the continent, Togo has a privileged place with the AT2ER tender for 317 mini-grids across the country, backed with West African Development Bank financing.

Neighboring Benin also offers great prospects as 119 MGs have been awarded to bidders and are at different stages of construction.

Nigeria also is a hot destination for MG developers as the Federal Government and its international

SEGMENT REVIEW: MG

partners are betting big on MGs to increase electricity access in the country: more than 100 MGs are already in operation or under construction in the country, and another 300 are said to be under development.

Sierra Leone also does pretty well when it comes to MG as more than 50 MGs are already in operation and another 45 are expected to be commissioned soon.

Finally, some major announcements have been made in a few other countries such as Senegal which recently launched a tender for 133 MGs and wants to have 1,000 villages supplied with MGs across the nation in total.

Cameroon also wants MGs to play an important part in the national electrification strategy with a target of 688 sites.

Last but not least, Madagascar is also seeing great potential in MGs and more than 50 MGs are currently being developed across the island.

On top of this enthusiasm for MG and the solution they will offer for rural electrification, it is also important to note that DFI financing is growingly being mobilized for such projects, with the objective of unlocking private capital to join the effort. The World Bank is one of the main supporters of MG development across the continent, being the primary financier of 60% of the MG programs currently in place across Africa. This and other excellent information assessing MG incentive programs in sub-Saharan Africa can be found in a research paper authored by Jonathan Phillips, Benjamin Attia and Victoria Plutschak for the Duke University Energy Access Project.

SEGMENT REVIEW: MG

And since this paper, more commitments have been made by several entities, such as AfDB and SEforALL. AfDB has recently announced an $8M package with the goal to create 80MW of MG capacity. On its side, SEforALL has launched the Universal Energy Facility, a $3M results-based financing mechanism focusing on MGs in Madagascar, Sierra Leone and Benin.

Another notable development in the MG space to watch in 2021 is the Essor project in DRC. After a demanding tender process, the consortium formed by Eranove, AEE and Gridworks has been awarded the first stage of this landmark MG initiative launched by DFID and supported by AfDB. This stage aims at building mini-grids in 3 remote cities of DRC for a total of 25,000 household and SME connections. These will probably be the largest MGs of the continent, if not the world.

SIERRA LEONE

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Africa Solar Industry Association

OBJECTIVES

- RE to contribute more than 100,000 GWh by 2020 link
- green mini-grids and isolated systems to account for 37% of the total electricity access target link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0.4 MWp
MG	3.7 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0063.	$0.203	$0.213
MAX.	$0.180	$0.211	$0.214

source

POLICY / REGULATION

- all SHS are exempted from import duties and VAT link
- PV equipment and low energy or energy-efficient appliances that meet IEC global standards are exempt from GST link
- no net-metering, no FiT

ELECTRIFICATION RATE

- 40% of the population has access to electricity link
- target to reach 92% access to electricity by 2030 link

NOTEWORTHY DEVELOPMENTS

- Orange telecom towers to be solarize through Escotel link
- 6 MWp Freetown solar park under construction link
- 98 MG commissioned or under construction link

SOMALIA

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Africa Solar Industry Association

OBJECTIVES

• addition of 200 MW by 2025, of which 50 MW PV link

TOTAL PV INSTALLED

LARGE SCALE	10.4 MWp
C&I	0.5 MWp
MG	1.9 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.390	$0.390	$0.390
MAX.	$0.390	$0.390	$0.390

source

POLICY / REGULATION

• tax exemptions can be negotiated by both local and foreign investors
• no national electrification policy in place waiving taxes on PV products
• no FiT and no net-metering

ELECTRIFICATION RATE

• 15% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

• BECO planning 92 MWp extension of Mogadishu solar plant link
• Abu Dhabi fund for development financing construction of 7 MWp Bosaso solar plant link

SOUTH AFRICA

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Africa Solar Industry Association

OBJECTIVES

- 41% of RE in national energy mix by 2030 link
- 17,742 MW of wind; 8,288 MW of solar PV; 4,600 MW of hydropower, and 600 MW of CSP by 2030 link

TOTAL PV / CSP INSTALLED

LARGE SCALE	2,726.7 MWp PV + 250 MWe CSP
C&I	101 MWp
MG	0.7 MWp
SHS & RESIDENTIAL	1.06 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.035	$0.046	$0.042
MAX.	$0.289	$0.286	$0.277

source

POLICY / REGULATION

- no import duties link
- possible for companies to write off 100% solar investment in year 1 link
- net-metering available in some municipalities link

ELECTRIFICATION RATE

- 92% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

- South Africa launching large scale procurement for 6.8 GW PV in 3 rounds link
- Winners of 2,000 MW Risk Mitigation tender to be announced soon link
- Multitude of C&I projects launched or under tender, among others Sasol 300 MW project link

SOUTH SUDAN

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OBJECTIVES

- country currently developing its Renewable Energy Development Program link
- solar expected to be the best option to improve the nation's dependence on fossil fuels link

TOTAL PV INSTALLED

LARGE SCALE	■	1 MWp
C&I	■	2.2 MWp
MG		0 MWp
SHS & RESIDENTIAL		0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.193	$0.270	$0.270
MAX.	$0.193	$0.270	$0.270

source

POLICY / REGULATION

- PV subject to 10% import duties and 10% VAT link
- no FiT, no net-metering

ELECTRIFICATION RATE

- 9% of the population has access to electricity

NOTEWORTHY DEVELOPMENTS

- Elsewdy Electric and Asunim Solar to build 20 MWp and 35 MWh hybrid in Juba link
- Scatec building 4 MW+ C&I project for international agencies link

SUDAN

AFSIA
Africa Solar Industry Association

OBJECTIVES

- 50% RE excluding hydro in the national energy mix by 2030 link
- objective to contract 500 MW of PV link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	0 MWp
MG	0 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.			
MAX.	$0.114	$0.180	$0.180

source

POLICY / REGULATION

- import duty on PV components is 10% and VAT is 15% link
- government said to be preparing the launch a FiT Scheme for RE with UNDP support in 2017 link
- electricity price was increased by 500% on Jan 1, 2021 link
- no net-metering

ELECTRIFICATION RATE

- 60% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

- UAE government financing 500 MW total capacity in multiple large scale projects link

TANZANIA

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OBJECTIVES

• Electricity Industry Reform Roadmap planned for 100 MW PV and 200 MW wind by 2024 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	1.4 MWp
MG	0.5 MWp
SHS & RESIDENTIAL	23.76 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.043	$0.084	$0.065
MAX.	$0.126	$0.126	$0.068

source

POLICY / REGULATION

• PV products and associated components (except solar lights) are exempted from import duties and VAT link
• FiT of $0.21/kWh for MG, FiT to systems connected to the national grid at $0.079/kWh in the dry season, $0.059/kWh in the wet season link
• net-metering in application since 2017 link

ELECTRIFICATION RATE

• 33% of the population has access to electricity link
• plans to increase connections to 30% by 2015, 50% by 2025 and 75% by 2033 link

NOTEWORTHY DEVELOPMENTS

• 10 MW Kahama Solar under construction link
• AFD supporting the development of the 60 MWp Shinyanga Solar Project link
• Tanesco 50 MW tender results expected still expected link

TOGO

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Africa Solar Industry Association

OBJECTIVES

- target of 4% of PV in the energy mix by 2020 and 10% by 2030 link
- CIZO Programme to reach 300,000 householdes with off-grid solar by 2022 link

TOTAL PV INSTALLED

LARGE SCALE	0 MWp
C&I	3.8 MWp
MG	0.3 MWp
SHS & RESIDENTIAL	0 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.152	$0.084	$0.065
MAX.	$0.280	$0.126	$0.068

source

POLICY / REGULATION

- all RE components are exempt from import duties and VAT link
- CIZO Programme offers subsidies to households to cover the cost of off-grid PV systems link
- no net-metering, no FiT

ELECTRIFICATION RATE

- 28% of the population has access to electricity link
- target of 100% electricity access by 2030 link

NOTEWORTHY DEVELOPMENTS

- AMEA Power building 50 MW Blitta project link
- Results to be announced for 317 MG tender link
- AT2ER ranks 3rd for its renewable energy strategy in Ashden Awards 2020 link

TUNISIA

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Africa Solar Industry Association

OBJECTIVES

- 3.6 GW of RE capacity by 2030 link
- solar plan 2030 targets 1,510 MW of PV and 450 MW of CSP link

TOTAL PV INSTALLED

LARGE SCALE	36 MWp
C&I	7.6 MWp
MG	0 MWp
SHS & RESIDENTIAL	1.80 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.026	$0.046	$0.061
MAX.	$0.173	$0.172	$0.161

source

POLICY / REGULATION

- imported energy equipment with no locally produced equivalent are subject to minimum customs duties and are exempt from VAT link
- net-metering and FiT possible link

ELECTRIFICATION RATE

- 99.8% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

- Tunisia launches 5th round of tender for 70 MWp link
- Scatec to build 360 MW in Tatouine, Tozeur and Sidi Bouzid link
- Qair to test floating PV with 200 KWp in Tunis link

UGANDA

AFSIA
Africa Solar Industry Association

OBJECTIVES

• achieving more than 90% of renewable electricity production by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	60 MWp
C&I	2.5 MWp
MG	1.6 MWp
SHS & RESIDENTIAL	9.34 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.203	$0.106	$0.063
MAX.	$0.203	$0.228	$0.203

source

POLICY / REGULATION

• PV panels exempt from import duties and VAT link
• related solar accessories are subject to import duty up to 35% and VAT up to 18% link
• analysis being done on net-metering scheme link

ELECTRIFICATION RATE

• 20% of the population has access to electricity link
• target 99% electrification rate by 2030 link

NOTEWORTHY DEVELOPMENTS

• AMEA Power to develop 90 MW link
• Chinese CEEC to build 500 MW link
• 113 MG under development with support of various DFI's

ZAMBIA

AFSIA
Africa Solar Industry Association

OBJECTIVES

• target to generate 600 MW of PV by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	89 MWp
C&I	0.2 MWp
MG	0.1 MWp
SHS & RESIDENTIAL	1.35 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.026	$0.060	$0.015
MAX.	$0.109	$0.103	$0.043

source

POLICY / REGULATION

• 0% import duties and 0% VAT on solar products link
• no permit required for systems <100kW link
• no FiT
• net-metering is mentioned in 2016 grid code but it has never been applied link

ELECTRIFICATION RATE

• 36% of the population has access to electricity link
• target by 2030 to electrify 90% of urban population and 51% of rural link

NOTEWORTHY DEVELOPMENTS

• Power China to build 3 times 300 MWp for ZESCO link
• Globeleq and SOLA Group awarded 2 times 20 MW link
• Toyota Tshusho and Elsewedy electric to build 2 times 50 MW Ac link

ZIMBABWE

AFSIA
Africa Solar Industry Association

OBJECTIVES

- target 1,575MW of power from solar by 2030 link
- 1,100 MW RE by 2025 and 2,100MW by 2030 link

TOTAL PV INSTALLED

LARGE SCALE	36.5 MWp
C&I	13.6 MWp
MG	0.2 MWp
SHS & RESIDENTIAL	0.21 MWp

source AFSIA IRENA

CURRENT TARIFF GRID ELECTRICITY

	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
MIN.	$0.021	$0.021	$0.021
MAX.	$0.201	$0.201	$0.201

source

POLICY / REGULATION

- all PV components are exempt from import duties link
- net-metering possible with basic registration link

ELECTRIFICATION RATE

- 39% of the population has access to electricity link

NOTEWORTHY DEVELOPMENTS

- Zuva Petroleum to solarize 180 service stations link
- Nhimbe Fresh Factory soon to benefit from hybrid 1.9 MW / 3.9 MWh project under PPA link
- 240 MW total capacity under development or construction at Zimbabwean mines

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