Sun Africa

Renewable energy solutions

About Us

Sun Africa is a joint venture between an established, large U.S. based utility-scale, solar developer and an oil and logistics company that brings experience and in-depth knowledge of the region. Sun Africa offers comprehensive solutions to develop solar projects and renewable energy strategies. As a leading utility-scale solar project developer and off-grid solution provider, Sun Africa is redefining what it means to be a clean energy company. Our mission is to help the world meet its energy needs sustainably.

With technology expertise, supply chain capabilities, and access to capital, Sun Africa and its partners deliver projects with low cost and high efficiency. Working with the largest energy engineering, procurement, and construction companies (EPC), Sun Africa maximizes economic value by selecting optimal electrical generating components, negotiating local contracts, maintaining, and real-time monitoring the project site.

About Us

Urban Green Technologies™

Urban Green Technologies LLC (UGT) is an established utility-scale solar developer based in the U.S.
With the combined strength of knowledge and resources, UGT efficiently leads the development, installation, financing, operation and maintenance of solar renewable energy development and ensures the timely completion of projects within program guidelines.
UGT has partnered with leading utility companies, investment funds, EPC, technology manufacturers, financial institutions and other leading entities engaged in renewable energy business.
In 2014, UGT was recognized and awarded the Excellence in Site Reuse Award by the U.S. EPA for exceptional leadership utilizing renewable energy at the Shaffer Landfill, Iron Horse Park Superfund Site in North Billerica, Massachusetts.

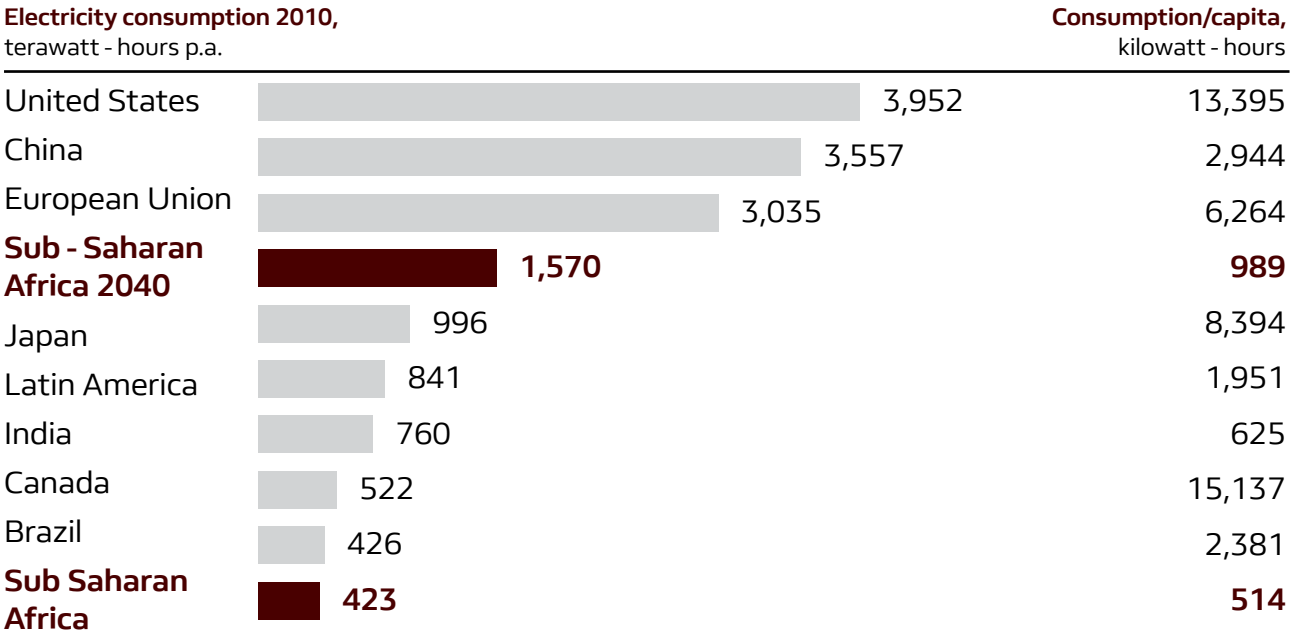
PERSOIL

PERSOIL is a Nigerian company providing consulting and professional services in a focused way to maximize effectiveness and value.
As a dynamic oil trading and distribution company, PERSOIL handles all logistical and commercial processes related to the storage, transport and trade of petroleum products as well as specialized materials. PERSOIL brings experience and in-depth knowledge of the region.
PERSOIL is a trusted service provider in the Oil and Gas industry in Nigeria and currently delivering construction and maintenance equipment for NNPC and his operating partner Total. PERSOIL has developed various in-house service tools namely CLEAR and NOMAD as to efficiently complete the supply chain integration of our projects. PERSOIL has international reach and representation and are trading in various West African countries.

Energizing Africa

The energy demand in Africa will increase as the African population and urbanization continue to expand. McKinsey, a consultancy, estimates that by 2040 Sub-Saharan Africa will consume as much electricity as India and Latin America combined in 2010[1].

Projected vs. Current Electricity Consumption

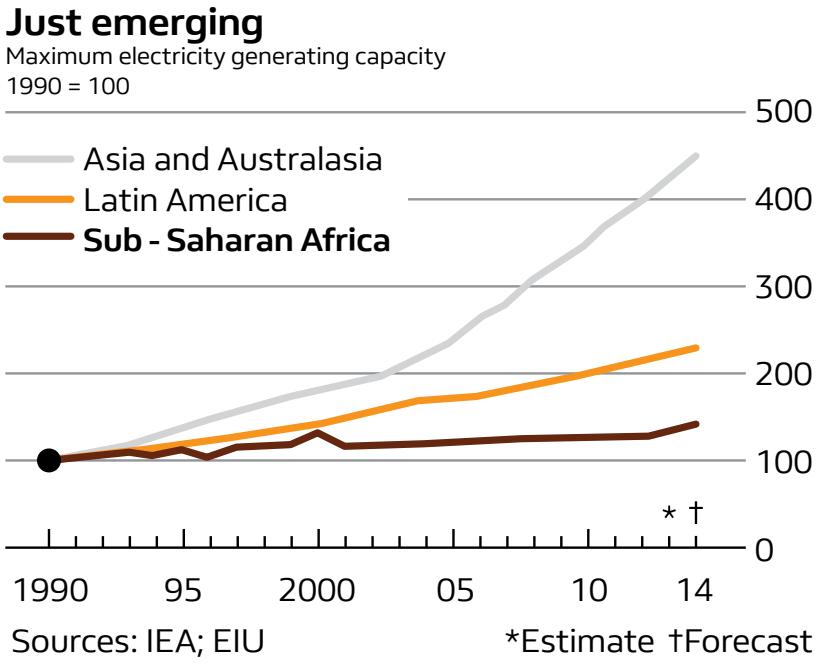


Source: Key World Energy Statistics, Organisation for Economic Co-operation and Development and the International Energy Agency, 2013, iss.org; World Development Indication, World Bank Group, worldbank.org

[1] *Antonio Castellano et al, Brighter Africa: The growth potential of the sub-Saharan electricity sector (McKinsey & Company, 2015), 3*

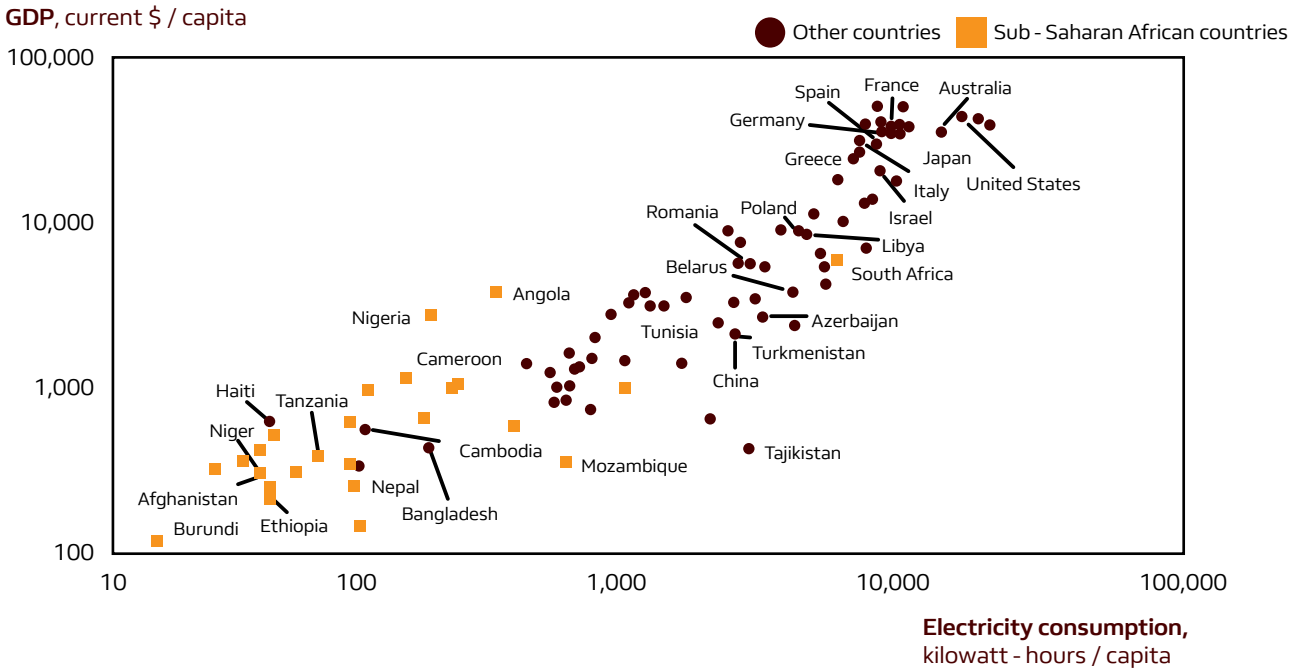
Despite the surging demand, the supply of electricity has been stagnating. Only 32% of the population in the Sub-Saharan region has access to electricity – this is roughly the same as the U.S. in 1920 and the U.K. in 1929 – and progress has been slow[2]. For example, in the decade between 2000 and 2010, generation capacity in Sub-Saharan Africa increased by a total of 6,000MW. Whereas in China, the total electricity capacity increased by 8,000MW every month in 2010[3]. This gap will continue to widen if measures are not taken to introduce new energy supplies[4].

Electricity Generating Capacity by Regions



[2] *The Fourteenth United States Census , www.census.gov; and Hannah, L, Electricity Before Nationalisation, John Hopkins University Press, 1979.*
[3] *US EIA Historical Statistics for 1980-2010.*
[4] *Economist, Lighting a Dark Continent (Economist, 2014).*

Electricity Consumption and GDP Per Capita by Country



The power shortages and blackouts bring dire consequences upon the society and the economy.

Lack of power has resulted in rising anger among voters for whom reliable electricity was supposed to be a dividend of democracy and economic growth.

Electricity consumption and economic development often go hand-in-hand. Sub-saharian African countries will be able to unleash rapid growth only when it takes steps forward in the power sector[5].

[5] *Economist, Lighting a Dark Continent (Economist, 2014).*

Why Solar is The Answer

Steady stream of income

PPAs are usually for 20+ years and offer a steady return on investment and a steady stream of income. Solar can also offer a hedge against rising electricity prices.

Matching Peak Time Output with Peak Time Demand

Solar energy can effectively supplement electricity supply from an electricity transmission grid, such as when electricity demand peaks in the summer.

Reduced Dependence on Fossil Fuels

Solar energy production does not require fossil fuels and is therefore less dependent on this limited and expensive natural resource. Although there is variability in the amount and timing of sunlight over the day, season and year, a properly sized and configured system can be designed to be highly reliable while providing long-term, fixed price electricity supply.

Modularity and Scalability

As the size and generating capacity of a solar system are a function of the number of solar modules installed, applications of solar technology are readily scalable and versatile.

Flexible Locations

Solar power production facilities can be installed at the customer site which reduces required investments in production and transportation infrastructure.

Environmental Advantages

Solar power production generates electricity with a limited impact on the environment as compared to other forms of electricity production.

Marketing and Image Perception

Boost environmental awareness directed towards potential clients, consumers, partners and communities. 'Green initiatives' provide for effective and affordable marketing message to your customers.

Solar Advantage: Reducing the Dependence on Fossil Fuels

Because some countries cannot refine the majority of their crude oil, most oil products are imported from abroad, which contributes to trade deficits.

By contrast, solar energy production does not require fossil fuels. Although there is variability in the amount and timing of sunlight, a properly configured solar energy conversion system can be designed to provide reliable electricity supply

Grid connected PV systems provide affordable and sustainable energy (no exhaust fumes, no noise, no effects to water and associated uses, no fuel spillages when compared to diesel generators and easy to deploy/implement when compared to hydropower). Furthermore, solar plants can be built close to where the power is consumed, putting minimal stress on the grid.

Solar Advantage: Job Creation

Facility construction and the subsequent maintenance phase will create employment opportunities to local population and communities. It is estimated that 1,000MW of added electricity capacity would support the development of over 20,000 businesses, which could provide over 800,000 salaried jobs[6]. This will generally improve the economic situation of the local residents.

The majority of the employment opportunities, specifically the skilled and semiskilled jobs, are likely to be associated with the construction of the facility and associated infrastructure. Additionally, it is expected that during construction, local materials suppliers/traders for sand, cement, steel, stone aggregate and general transportation services will benefit greatly from this project.

6 Based on the co-causal positive correlation between growth in electricity production and waged employment in the modern sector, Kenya, 2001-2013. Data source: Kenya National Bureau of Statistics.

Job Creation by Renewable Energy Type

TECHNOLOGY	MCI (Jobs per newly installed MW)	O&M (Jobs per MW)	REGION	YEARS OF ESTIMATION	SOURCE
Wind, onshore	8.6	0.2	OECD countries (Average values)	Various (2006 - 2011)	Source 1
	27.0	0.72	South Africa	2007	Source 2
	6.0[a]	0.50	South Africa	NA	Source 3
	12.1	0.1	United States	2010	Source 4
	8.8	0.4	Greece	2011	Source 5
Wind, offshore	18.1	0.20	OECD countries (Average values)	2010	Source 1
Solar PV	17.9	0.30	OECD countries (Average values)	Various (2007 - 2011)	Source 1
	69.1	0.73	South Africa	2007	Source 2
	25.8	0.70	South Africa	NA	Source 3
	20.0	0.2	United States	2011	Source 4
CSP	18.0	1.33	South Africa	2007	Source 2
	36.0	0.54	South Africa	NA	Source 3
	7.0	0.6	Spain	2010	Source 6
	19.0	0.9	Spain	2010	Source 7
Hydro, large	7.5	0.30	OECD countries (Average values)	Various	Source 1
Hydro, small	20.5	2.40	OECD countries (Average values)	Various	Source 1
	20.3	0.04	South Africa	2009	Source 2[b]
Geothermal	10.7	0.40	OECD countries (Average values)	Various (2009 - 2012)	Source 1
	5.9	1.33	South Africa	2004	Source 2
Biomass	7.7	5.51	South Africa	2000	Source 2

[a] A probable reason for the smaller MCI employment factor in the Green jobs report is because the authors do not account for differences in regional labour pruductivites.

[b] The source does not specify small hydro; however, the number provided is based on another study focused on small hydro

Sources: 1) Rutovitz and Harris (2012); 2) Rutovitz (2010); 3) Maia et al. (2011); 4) National Renewable Energy Laboratory NREL (2010); 5) Tourkollas and Mirasgedis (2011); 6) NREL (2013); and 7) NREL (2012).

Our Approach

Sun Africa's core competencies include:

- Developing projects, including site selection, project engineering and design, interconnection, permitting, incentive procurement, negotiation and execution of project documents
- Providing development capital for pre-construction activities
- Providing capital for project construction and long-term ownership
- Providing due diligence for third party projects or projects that are at various stages of development for outside investors

Sun Africa adopts a phased-approach in developing solar projects:

- The **pre-construction** phase will include carrying out land surveying, power plant design review with reference to the highest industry standards; planning for storm water drainage and containment, undertaking site preparation, manufacturing-**procurement** of items and transporting the required components and construction equipment to site
- The **construction phase** will include establishment of internal and external access roads; establishment of construction areas; construction of the entire solar array, construction of the power substation or other onsite structures) and other ancillary infrastructure (i.e. power-line for evacuation of electricity); and inter-connection of the solar plant substation to the national electricity utility grid
- The **post-construction phase** will include plant operation and maintenance, site remediation, clearance and deposition of debris off the site, restoration of areas where construction activities temporarily disturbed the environment, repairs and replacements of failed parts; and finally decommissioning the entire plant when the useful life of the facilities is over

Analysis

- Ascertain reliable solar relation to land, rooftop or field source area to predict annual performance
- Proximity studies to the nearest grid
- Review of necessary permits
- Financial assessment

Design

- Detailed implementation planning
- Budget Development Land lease options
- Landowner & stakeholder agreements
- PPA negotiated or Feed-In-Tariff secured

Build

- Procurement (RFP/RFQ)
- Selection and tendering to subcontractors
- Logistics
- Construction supervision
- Quality control and final inspections

Manage

- Real time site monitoring
- Verify performance output
- Provide site security
- Perform periodic maintenance
- Perform necessary repairs
- Monitor warranty terms

Our Capabilities

Capabilities / finance

Sun Africa offers a complete solution for anyone looking to either develop a solar project or invest in renewable energy.

Sun Africa:

- Develops projects, including site selection, project engineering and design, interconnection, permitting, incentive procurement, and negotiation and execution of project documents
- Provides development capital for pre-construction activities
- Provides capital for project construction and long-term ownership
- Provides due diligence for third party projects or projects that are at various stages of development for outside investors.
- Offers off-grid and energy access solutions

Sun Africa's Unique Solutions

Sun Africa's parent company has developed, constructed, owned and operated several successful utility scale solar projects.

Shaffer Landfill
6MW (DC) Billerica, MA

- 100 acres
- Operation starts in July 2014
- Working with large $20 billion European based investment fund

This project is the largest solar development on a capped landfill to date in the state of Massachusetts. In 2014, the project was awarded the Excellence in Site Reuse Award by the US EPA for exceptional leadership utilizing renewable energy at the site.

Oxford Solar Array
3,56MW

- 100 acres
- Operation starts in May 2014
- Working with large US based investment fund active in solar

The Oxford Solar Array parcel was previously used for growing hay. Overcame significant rezoning and shading issues related to cell tower close to site.

Shirley Airport
5,86MW

- 55 acres
- Operation starts on May 2014
- Working with large European utility active in US market

The Shirley Airport is a closed airport site located on environmentally challenged land.

Iron Horse Superfund Site
Combined 16.5MW

- Combined 68 Acres

Two parcels of land located on the Iron Horse Superfund Site are fully permitted and awaiting construction upon the lifting of the net metering cap in Massachusetts.

Bird Machine Solar Farm
4.75MW

- 40 Acres

Bird Machine Solar Farm is located on an old factory site that is classified as a brownfield by the US EPA. The project will begin generating electricity in Q2 2016.

Our Projects

Running Projects

Senegal

Sun Africa has bid to a PRODAC (Programme National des Domaines Agricoles Communautaires) call for tender and may develop an off grid PV plant. PRODAC is the National program of the Community Agricultural Domains in Senegal. The first project will be a 1MW PV Plant in Sedhiou, a community agricultural domain. Next, a 3MW PV plant will the developed. The goal is to eventually establish 60MW of PRODAC solar PV projects.

Nigeria

Sun Africa is developing 100MW of solar PV in Daura, located in Katsina State of Nigeria. The land in Daura will be leased from the state for a 99-year term. Sun Africa has political support from the head of state as well as Nigerian Bulk Electricity Trading (NBET) and Transmission Company of Nigeria (TCN), two Nigerian governmental bodies. A 20-year PPA is expected to be signed by NBET with a World Bank guarantee. Additionally, an interconnection study is currently being performed.

Prospective Projects

Sun Africa wishes also to develop main projects in other African countries

Algeria : 50MW during the 2 coming years
Guinea : 10 MW during the 2 coming years

Our Partners

www.eversheds.com

www.juwi.com

www.erm.com

AFDIN construction

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