2017

AFRICA - Energy Report

Think Tank Egypt

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Targeted countries: Djibouti - Rwanda - Tanzania - Uganda

Intro

Africa has abundant renewable energy resources. Traditionally reliant on hydropower, the continent is increasingly turning to solar photovoltaic (PV) to bolster energy security and support rapid economic growth in a sustainable manner. Solar PV module prices have fallen by 80% since the end of 2009, and PV increasingly offers an economic solution for new electricity generation to meet the high demand, both on- and off-grid.

Africa is endowed with significant renewable resources of all forms. Hydropower has traditionally been the largest renewable power generation source, contributing 97terawatt-hours of hydropower generation in 2013 (15% of total generation). However, with recent cost reductions for solar PV, concentrating solar power (CSP) and wind power, this could change rapidly. Solar PV module prices have fallen rapidly since the end of 2009, to between USD 0.52 and USD 0.72/watt (W) in 2015.1 At the same time, balance of system costs also have declined. As a result, the global weighted average cost of utility-scale solar PV fell by 62% between 2009 and 2015 and could decline by 57% from 2015 levels by 2025.

Globally, new capacity additions of solar PV have increased six-fold from around 8 gig watts (GW) in 2009 to around 47 GW in 2015. This growth has largely bypassed Africa, despite solar irradiation in African countries being 52% to 117% higher than in Germany. However, technology improvements and lower costs have spurred local and social entrepreneurs in the solar home system (SHS) market2 and in stand-alone mini-grid markets, while in the utility-scale sector – systems larger than 1 megawatt (MW) – support policies are beginning to bear fruit. New capacity additions of solar PV in Africa in 2014 exceeded 800 MW, more than doubling the continent's cumulative installed PV capacity. This was followed by additions of 750 MW in 2015. By 2030, in IRENA's Remap analysis of a doubling of the share of renewable energy globally, Africa could be home to more than 70 GW of solar PV capacity.

With recent cost reductions, solar PV now offers a rapid, cost-effective pathway to providing modern energy services to the approximately 600 million Africans who lack access to electricity and utility-scale electricity for the grid.

Solar PV is a highly modular solution, both on-grid and off-grid. It can provide lighting and electricity to a single home off-grid, can be incorporated into mini-grids that can scale from several kilowatts (kW) to many MW, and at utility-scale can achieve higher economies of scale. Facilitated by and pulled by the growth of "mobile money"3, small 20-100 W SHS can be purchased on pay-as-you-go schemes, and provide modern energy services for lighting, mobile phone charging and other small appliances that are higher quality than the equivalent, at a similar, or lower, monthly cost. At the same time, auctions and tenders for utility-scale solar PV in North Africa and South Africa have shown that solar PV can be a cost-effective large-scale source of new capacity. There also is increasing interest in the use of solar PV in mini-grids, both isolated and grid-connected, which can be an attractive option to reduce diesel costs or to go 100% diesel free.

Solar PV has another advantage. Project lead times are among the shortest of any power generation technology and can be deployed much more rapidly than many other generation options. Given the pressing need across Africa to address the low rates of access to electricity and poor-quality electricity supply, the ability to rapidly scale up solar PV is a significant benefit.

Why TTE recommend the designated countries?

1- Geographical nearby.
2- Promising development plans.
3- The need to increase the supply of electricity domestically.
4- The governmental plan for the industrial.
5- Attracting new investments that support the support the local economy.

1- Djibouti

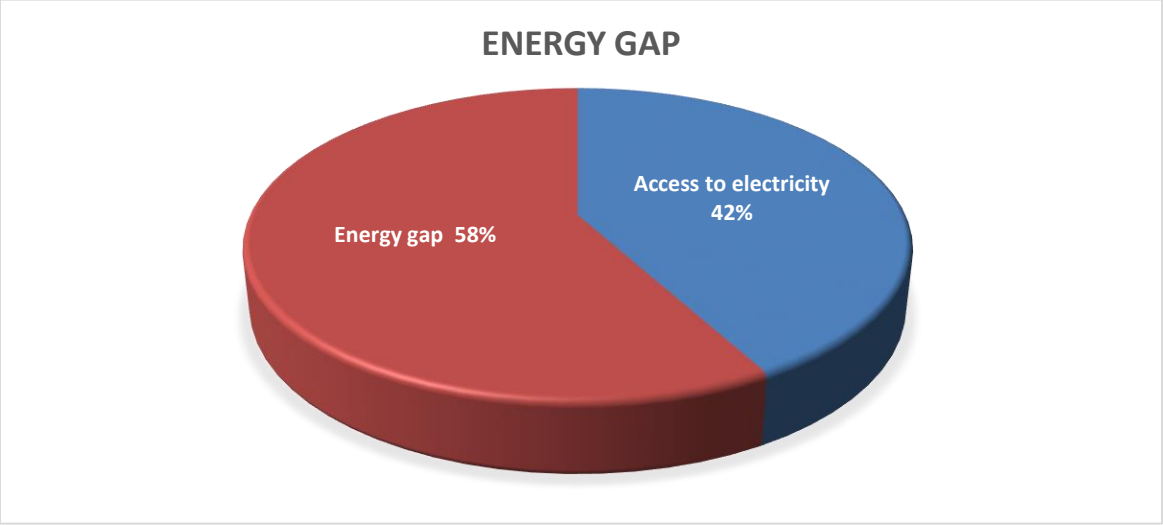
- Population: **899,598**
- GDP: 1,700,000,000
- Growth rate: 6.5%
- Reserve: 350 M

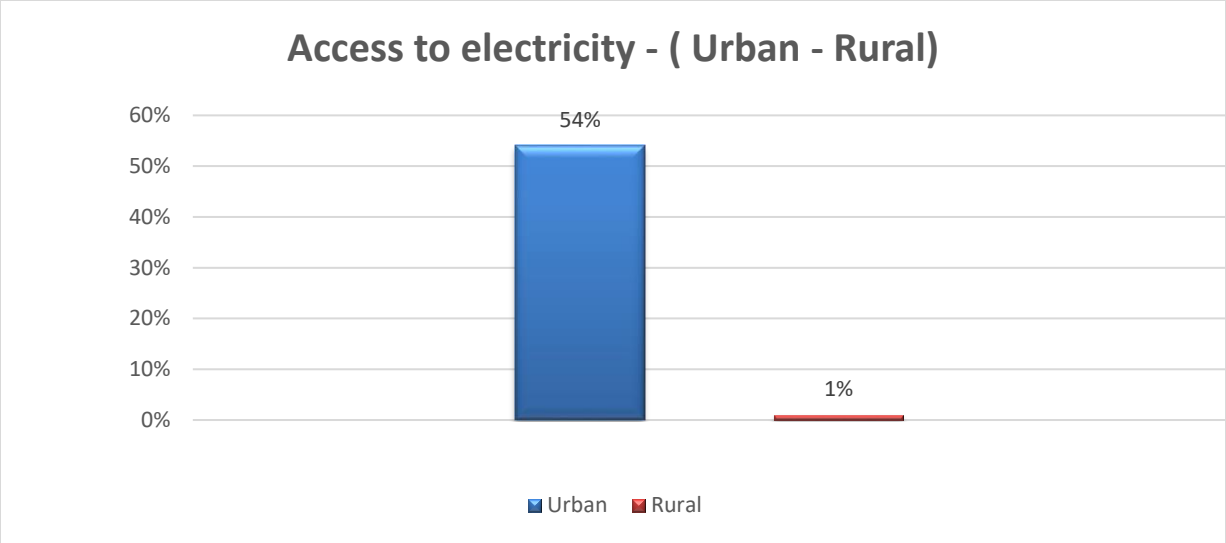
Trade balance with Egypt:

Imp. from EGY	Exp. to EGY	Balance
$20,800,581	$741,534	20,059,047

Energy profile:

A- Access to electricity: 42%
B- Current installed generation capacity: 100 MW
C- Urban access to electricity: 54%
D- Rural access to electricity: 1%
E- Energy gap as household: 58%
F- Traditional Biomass for cooking: 16%





Conclusion:

Djibouti is coastal country with an eastern African major sea port despite of its low Population the country household electricity shortage not to mention the business need and the probability of industrialization the chance is clearly present.

2- Rwanda

- Population: 12,988,423
- GDP: 8,100,000,000
- Growth rate: 6%
- Reserve: 1B.

Trade balance with Egypt:

Imp. from EGY	Exp. to EGY	Balance
$20,942,609	$356,181	20,586,428

Energy profile:

A- Access to electricity: 27%

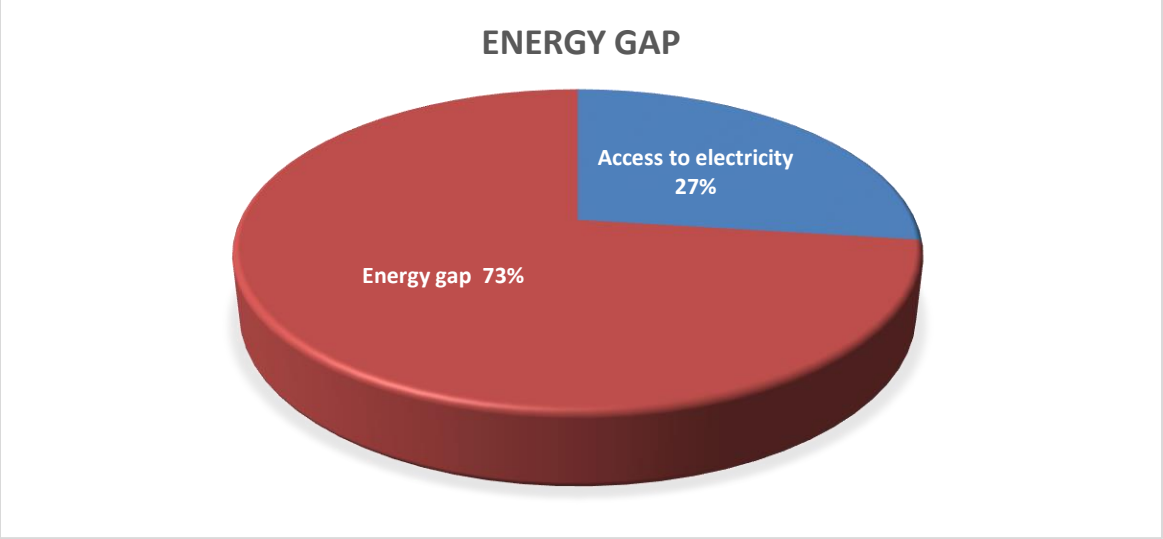
B- Current installed generation capacity: 87.9MW

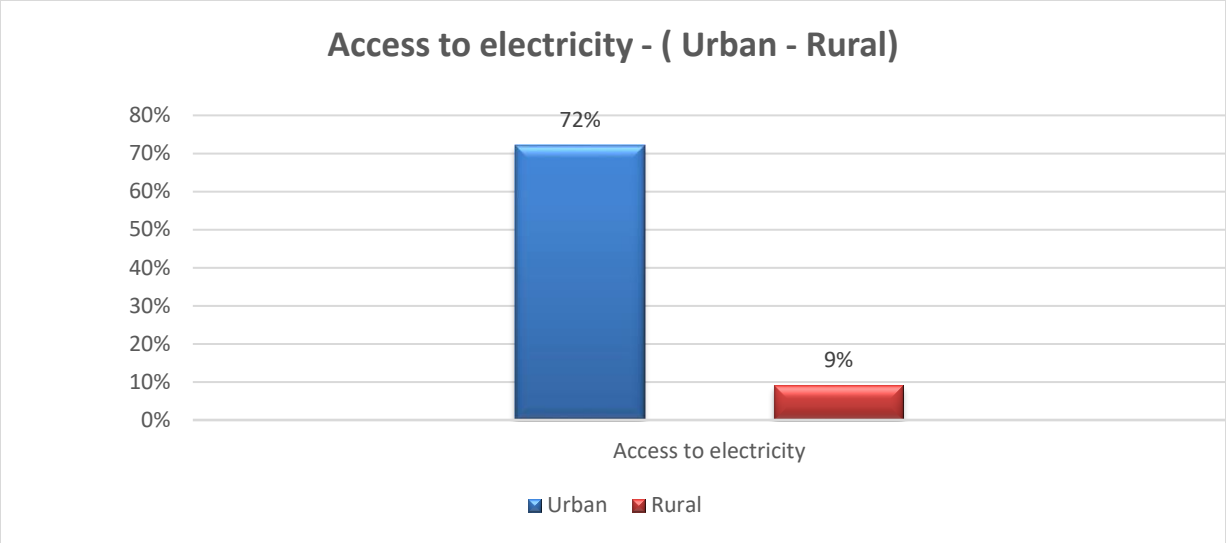
C- Urban access to electricity: 72%

D- Rural access to electricity: 9%

E- Energy gap as household: 73%

F-Traditional Biomass for cooking: 90%





Conclusion:

Rwanda is one of the good growing economies in Africa not to mention the real estate sector to serve their ongoing plans for tourism and other sectors they plan to develop their urgency for electricity push itself as a top priority.

3- Tanzania

- Population: 52,482,726
- GDP: 45,000,000,000
- Growth rate: 7.2%
- Reserve: 4 B

Trade balance with Egypt:

Imp. from EGY	Exp. to EGY	Balance
$28,634,758	$8,252,997	20,381,761

Energy profile:

A-Access to electricity: 30%

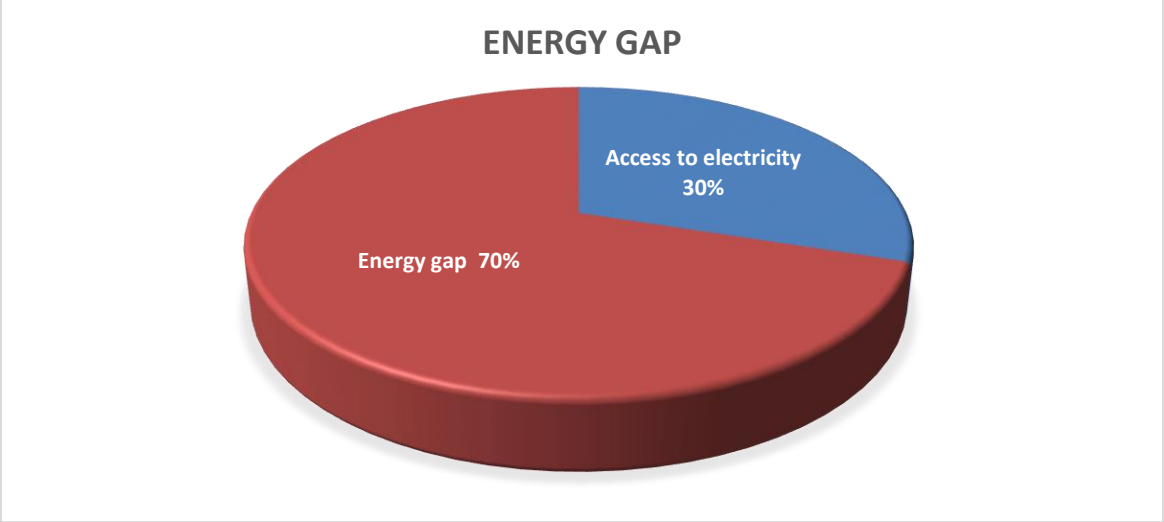
B-Current installed generation capacity: 5000 MW.

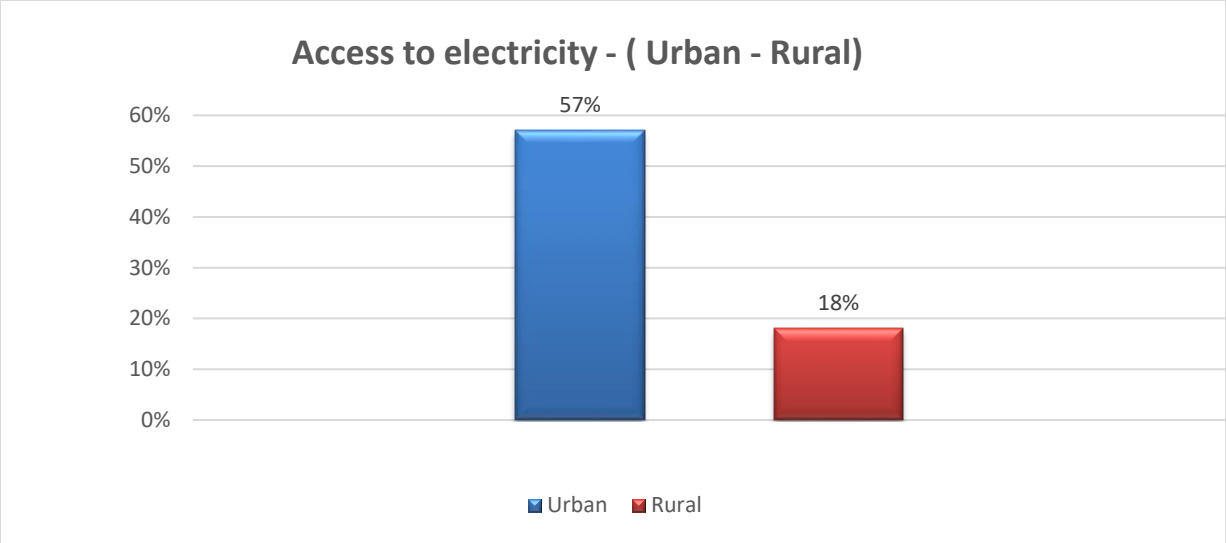
C-Urban access electricity: 57%

D-Rural access to electricity: 18%

E-Energy gap as household: 70%

F- Traditional Biomass for cooking: 96%





Conclusion:

Tanzania one of the top economic growth rate in Africa and is one of the major investment attractive destination despite of the power shortage, the opportunity of power investment present itself as independent one and also as a need for other investments.

4- Uganda

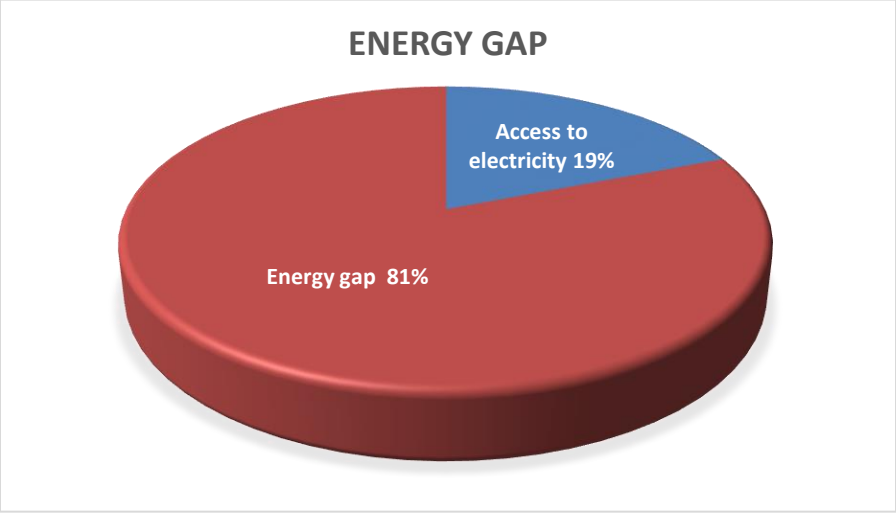
- Population: 38,319,214
- GDP: 27,000,000,000
- Growth rate: 4.9%
- Reserve: 3 B

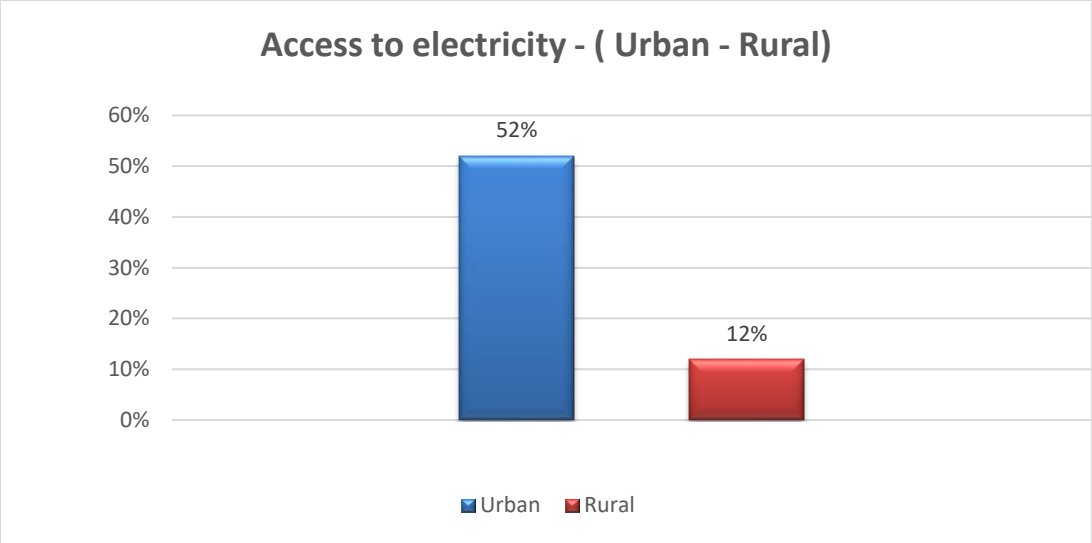
Trade balance with Egypt:

Imp. from EGY	Exp. to EGY	Balance
$48,359,482	$2,307,240	46,052,242

Energy profile:

A-Access to electricity: 19%
B -Current installed generation capacity: 2500 MW.
C- Urban access electricity. 52%
D-Rural access to electricity: 12%
E-Energy gap as household: 81%
G- Traditional Biomass for cooking: 98%





Conclusion:

Uganda is the second fastest growing country in Africa which makes it one of the most attracting countries for global investments especially in infra-structure, and it has a promising plan for agriculture and industry not to mention it started to get a higher rank in Africa for the higher education as quality and quantity.

Four Nations comparison: