

Growing Africa's Electricity Distribution Demand

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Energy is firmly connected to each and every aspect of human development and to enhance sustainability. In today's world, global solutions are constantly sought for global challenges which are but not limited to energy inefficiency, climate change, environmental pollution, scarcity of natural resources; all of which have resulted from overdependence and excessive usage of fossil fuels. To achieve sustainable development for humanity, the urgent need for dealing with this daunting task is enormous and cannot be overemphasized. Globally, clean energy development has become the pivot of sustainable development in energy production. Interestingly, the electricity mix has been gradually and systematically replacing other forms of energy in energy consumption.

Electricity has been projected to be the alternative for energy consumption by substituting crude oil and its fractionation products, natural gas, coal and firewood. Electricity possess the most environmental friendly distribution mechanism for the modern energy system in the 21st century; a shared interconnected electricity-mix. Therefore, a robust and effective production, transmission and distribution of clean energy sources cannot have come at a better time than now in order to demote carbonization and promote cleaning, electrification and networking. According to the Global Energy Interconnection (GEI) system, the realization of Agenda 2030 including the 'Paris Agreement' to guarantee reliable, clean and affordable modern energy for all is paramount in coordinating societal development, ecological environment and the economy. The Global Energy Interconnection Development and Cooperation Organization (GEIDCO) since 2016 have been looking at energy interconnection schemes at world, continents, regional and country level through systemic researches based on comprehensive data analysis and cognate statistics on the environment, energy and climate, including references from strategic developmental plans and policies of different governments, international organizations, enterprises and research findings from educational and research-based institutions. Accordingly, there have been advancement in technological model tools for studying the key issues that relate to the development of the energy mix, hence a holistic, innovative and systematic approach for global energy transition and clean low-carbon development is needed for energy interconnections across all continents and countries.

In Africa, there exist great potential for electricity generation from clean energy sources (especially solar, thermal, wind and hydro). The key to achieving sustainable development in the continent relies heavily on its abundant natural resources, spurring low-carbon

transitions, shaping and bolstering its energy interconnection infrastructure. For electricity to be effectively distributed in Africa, there has to be optimal generation fed into the electricity grid, including changes in markets and regulations that promote energy transitions and are in tune with globalization.

New or changes in existing programmes and policies must be made to enhance electricity interconnectivity and infrastructure across African countries, as most existing policies are still localized. Many African countries today face erratic power supply and countries producing abundant megawatts of electricity could supply to countries with low amount instead of unused storage, hence developing the interconnected electricity market. These could come through a harmonized legislation by all African countries, the African Union (AU) and its regional economic blocs namely; Economic Community of West African States (ECOWAS), Southern African Development Community (SADC), East African Community (EAC), Arab Maghreb Union (AMU), Economic Community of Central African States (ECCAS), The community of Sahel-Saharan States (CEN-SAD), Common Market for Eastern and Southern Africa (COMESA) and the Intergovernmental Authority on Development (IGAD). The objectives of these regional blocs are to attain sustainable growth and development of the member-states by promoting a more balanced and harmonious development of its production and marketing structures; to promote joint development in all fields of economic activity and the joint-adoption of macro-economic policies that will enhance the standard of living of its people, hence achieving cross-border, inter-regional and inter-continental electricity interconnections. Therefore, all clean energy sources must be rigorously and holistically developed into a 'multi-energy mutually supported electricity market system' in Africa that will guarantee diversified and more economic supply. Furthermore, sustainable 'growth strategy' to track electricity supply and for accountability should be adopted; for example, electricity-manufacturing strategy, electricity-consumer strategy and electricity-mining strategy.

Advocating for a coordinated growth through regulations between wind, solar and hydro power that will further promote energy transitions at a regional and continental level is paramount. There is possibility for an increase in the installed capacity of clean energy from 23% to 62% in 2035 and 77% in 2050. These regulations should reflect centralized large-scale energy development bases in conjunction

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with distribution patterns in areas with high-quality resources and growth conditions for sustainability. For example, abundant clean energy resources abound in Central and North Africa while large minerals resources are found in West and Southern Africa. Clean energy could be harnessed from the Congo River in Central Africa and abundant solar energy from North Africa, both serving as energy bases. West and Southern Africa with high population could serve as electricity load center markets while hydro-power and geothermal energy from the Nile River and East African Rift Valley respectively could meet power demand for the East-African region.

Growing Africa's electricity distribution demand is extremely important in ensuring a robust and effectual energy transition mix, as the political and business environments have gradually stabilized and is continuously improving.

References

- Africa Energy Commission. Africa Energy Database, 2016.
- International Renewable Energy Agency. Africa Energy Resource Potential, 2014.
- Africa Renewable Energy Initiative. Africa Renewable Energy Initiative: Summary, 2016.
- The African Union Commission (AUC). Agenda 2063: The Africa We Want, 2015.
- UNECA. Greening Africa's Industrialization, 2016.
- EIA. Annual Energy outlook 2018 with projections to 2050, 2018.
- IEA. Africa Energy Outlook 2014, 2015
- Eastern Africa Power Pool. EAPP Regional Power System Master Plan, 2014.
- West Africa Power Pool. Update of the ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy, 2011.
- (10)Southern Africa Power Pool. Southern Africa Power Pool Annual Report 2017, 2017.

Regions	Primary energy demand (Billion TCE)			Clean energy proportion in primary energy (%)			Final energy consumption (Billion TCE)			Electric power proportion in final energy (%)		
	2016	2035	2050	2016	2035	2050	2016	2035	2050	2016	2035	2050
North Africa	0.27	0.42	0.52	6	20	42	0.19	0.27	0.32	20	38	51
Central Africa	0.07	0.15	0.23	89	72	71	0.05	0.10	0.14	4	20	28
Southern Africa	0.31	0.51	0.62	33	41	52	0.18	0.34	0.40	18	25	33
East Africa	0.23	0.38	0.53	87	58	59	0.16	0.30	0.38	3	9	17
West Africa	0.29	0.46	0.65	75	66	64	0.24	0.33	0.41	3	19	31

Note: 2016 estimated data according to IEA.

TABLE 1: STATUS AND OUTLOOK OF AFRICA'S ENERGY DEVELOPMENT

Note: 2016 estimated data according to IEA.

Table 2 States and Outlook for Africa's Installed Capacity of Clean Energy

Region	Thermal (GW)			Hydro (GW)			Wind (GW)			Solar (GW)			Biomass (GW)			Geothermal (GW)		
	2016	2035	2050	2016	2035	2050	2016	2035	2050	2016	2035	2050	2016	2035	2050	2016	2035	2050
North Africa	80.43	130.51	120.9	4.97	7.05	7.05	1.91	18	36	0.56	93.37	207	0.07	0	0	0	0	0
Central Africa	1.88	7.21	8.67	4.01	55.61	142.58	0.01	0.48	0.8	0.01	2.05	4.6	0	1.57	3.4	0	0	0
Southern Africa	46.26	70.65	72.8	11.09	33.31	44.01	1.48	16.7	44.9	2.27	47.31	131.06	0.56	3.12	3.74	1.86	0	0
East Africa	4.21	13.9	23.66	23.66	35.78	53.26	0.36	6.92	26.33	0.1	28.45	113.7	0.57	1.84	1.63	0.66	8.3	11.37
West Africa	17.2	45.81	62.62	5.14	21.74	33.28	0.06	8.61	17.44	0.27	43.9	102.25	0.06	8.41	20.77	0	0	0

North Africa: Morocco, Algeria, Tunisia, Libya, Egypt

Central Africa: Chad, Cameroon, Central African Republic, Equatorial Guinea, Gabon, Congo, D.R. Congo, Sao Tome and Principe

Southern Africa: Angola, Botswana, Lesotho, Malawi, Namibia, South Africa, Swaziland, Mozambique, Zambia, Zimbabwe, Madagascar, Mauritius

East Africa: Sudan, South Sudan, Ethiopia, Kenya, Uganda, Eritrea, Djibouti, Rwanda, Burundi, Tanzania, Somalia, Comoros, Seychelles

West Africa: Niger, Nigeria, Benin, Togo, Burkina Faso, Ghana, Cote d'Ivoire, Liberia, Mauritania, Mali, Sierra Leone, Guinea, Guinea-Bissau, Senegal, Cabo Verde, Gambia