



The five biggest wind energy markets in Africa

Tony Tiyou

Tony Tiyou explores the top five markets in the African continent that are leading the way in wind power generation.

The renewable energy market is steadily growing in an African continent that can pride itself to possess in abundance a good mix of resources – sun, water, biomass and wind. Although far less uniformly distributed than the well documented solar resources, Africa with a large coastline still has one of the best potential for wind power production. Over the last decade, there has been a gradual decrease of the cost of wind power generation that is becoming very competitive compared to fossil fuels ones. Some countries, positioned in optimal locations, have sought to grab the opportunity to move from existing conventional power generation towards an increasing share of renewable energy. In doing so, they have developed local markets that are experiencing high growth rates and attracting a plethora of global companies from the sector. To give a better appreciation of the wind industry's size in Africa, let's take a look at the five current biggest wind energy markets and some the keys players.

Conditions for wind

Generally speaking, annual average wind speeds greater than 4 meter per second (m/s) (9 mph) are required for small wind turbines. For utility-scale wind power plants, a minimum average wind speed of 6 m/s (13 mph) would be needed. It is then not a surprise to find that the best wind in Africa is located in the coastal regions of the

continent: in the North, the East, the West and the South. The five biggest markets are also originated from these areas. As a matter of clarity, it is important to specify that markets have been ranked in function of their recorded capacity, either operational or under construction.

South Africa

With the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) launched in 2011, South Africa stands without the shadow of a doubt as the major contributor of the wind industry of the entire continent. The programme has



Africa's coastline provides ideal conditions for wind power generation.

been designed to contribute to meeting the national renewable energy target and to stimulate the renewable industry in South Africa. REIPPP is handled by the IPP Office and the programme is organised in rounds or bid windows. So far there have been 4 rounds. The main evaluation criterion for the bid selection process is pricing but other factors such as job creation, local content and black economic empowerment do also play a part. Since 2011, a total of **1170 MW** of wind turbine capacity has been built and another **840 MW** is currently in the pipeline. Overall, South Africa is aiming to install 8400 MW of wind capacity by 2030.

The REIPPPP is proving to be extremely successful in assisting to meet South Africa's energy demand and this success has been lauded globally. Being cited as a best practice example by the industry, many other African countries, especially in the north are thinking of replicating the winning formula.

It is only fair to say that this programme has demonstrated that the public private partnership model can fast track the delivery of much needed large-scale infrastructure projects.

Morocco

Before the advent of the South African market, the wind industry on the continent was particularly dominated by North African countries. In terms of installed capacity, Morocco currently sits in second position. So far, **870 MW** have been installed and another **50 MW** is under construction. As opposed to sub-Saharan African countries, Morocco has a high electrification rate, over 95% so the exploitation of the renewable resources is seen as a way to help the country becoming self-sufficient. Through the Moroccan wind energy programme, managed by a public body, the government has established a target of 2 GW of installed wind power by 2020 for an investment of USD 3.5 billion.

Egypt

Egypt occupies the third position but is very close to Morocco. In fact, the two countries are battling for the leadership of the market in the region. Egypt enjoys excellent wind regimes, particularly in the Suez Gulf where the average speed reaches 10.5 m/s. The market kick-started around 2001 and in 15 years, they have built about **750 MW** of wind capacity. Egypt ambitions



Wind farm near Essaouira, Morocco (image courtesy of LukaKikina/Shutterstock).

are to become the main renewable energy hub of North Africa, with manufacturing of components and the training of relevant technical skills. They have set a national target to 4.3 GW of renewable energy to its national production capacity by 2022. Wind energy is a vital part of these renewable energy developments as it will account for almost half (2 GW) of the declared target.

The Egyptian wind market is offering great prospects in part due to firm government backing which is fuelling investors' interest and confidence in the country's renewable energy future. Through the introduction of generous Feed-in Tariff (FiT) schemes (e.g. US\$9.57 cents/kWh for the first 5 years) and governments plans to invest over USD \$10 billion in renewable energy projects over the next decade, it has also encouraged international investment in the sector.

Ethiopia

East Africa's coast is well endowed with wind resources and has been gaining ground with commercial scale projects. Positioned in fourth position, Ethiopia has installed more than **320 MW** of wind farms to date. Quite notably here, the dry season in Ethiopia is also the windy season, meaning that wind power is a good complement to hydropower, which is by far the biggest source of renewable energy. With over 75% of the country 100 million people not connected to the national grid and mainly living in rural areas, Ethiopia's energy needs are huge. To meet rising demand the

government needs to increase its electricity production by 20–25% per year, according to figures from the country's energy ministry. In addition to that, Ethiopia has set a target of slashing its carbon emissions by 64% within the next 14 years, one of the most ambitious national goals across the planet. So clearly the Ethiopian space should be watched carefully.

Kenya

Kenya, which just a couple of years ago would have not made the list, is now proudly standing in fifth position, courtesy of one project, Lake Turkana. At its completion, this wind farm would simply be the biggest on the continent and on its own merit would lift the current country wind capacity from **14 MW** to **324 MW**. This would be enough to leapfrog Ethiopia and move onto the fourth position, providing of course that there is no movement in the Ethiopian market, which is unlikely (Figure 1).

Key players

The wind market in Africa, especially in South Africa, has attracted some of the world's largest multinational companies. The likes of Siemens, General Electric, Mainstream Renewables, EDF, Iberdrola Renewables, Engie, and Acciona are actively engaged in the continent. In North Africa, NREA in Egypt is the one of the largest owner/operator of wind energy capacity, followed by the Moroccan public utility ONE.

For the turbine manufacturers, the market is mainly dominated by global leaders in

Countries	Operational (MW)	Under construction (MW)
1- South Africa	1,170	840
2- Morocco	870	50
3- Egypt	750	0
4- Ethiopia	320	0
5- Kenya	14	310
Total	3,124	1,200

FIGURE 1
The five biggest wind markets in Africa.

the industry like Siemens, Gamesa and Vestas.

Conclusion

The 5 biggest markets in Africa are as expected in regions identified with strong wind resources. The wind industry on the continent was initially concentrated in North Africa, before taking off at a more significant pace in South Africa. With Ethiopia and Kenya, the East African market is progressively developing.

Taken altogether, the installed capacity of wind farms in these five countries is about 3.1 GW currently operational, and 1.2 GW under construction. Although in absolute terms this does not exceed 1% of the global total (433 GW in 2015 as per GWEC), it is nevertheless encouraging to see that Africa has finally awoken and warmed up to the industry. Should the growth rate be sustained, a totally different picture will emerge on windy Africa by the end of the decade.

Sources

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FURTHER INFORMATION

Renewables in Africa, www.renewablesin africa.com