

Technology transforming energy landscape in Africa

According to Webb Meko, business development director, sub-Saharan Africa, Black & Veatch, the next generation of energy infrastructure is being spurred by new technology that places energy solutions directly into the hands of consumers and businesses.



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Growth in distributed energy resources (DERs) like wind, solar, geothermal and battery storage is drastically shifting the way that electricity is generated, transmitted and consumed by customers around the world. For most power utilities, including many across Africa, DERs create opportunities and challenges as they seek alternative ways of addressing potential shifts in power demand growth, while working to ensure electricity grid modernisation. In other areas, DERs also offer new possibilities to deliver baseload generation and presents an opportunity to expand baseload capacity that will be required in the future.

“While big, bulk power generation plants remain in demand, the critical need for distributed energy assets to drive electrification expediently and meet the needs of anticipated business growth and consumer demands is mounting,” says Meko.

Modern energy dynamics

These solutions are often challenged by the lack of power capacity, as well as generation and transmission infrastructure to enable local distribution access. Often modern energy dynamics can prove to be difficult from a financing perspective, pushing the case for the traditional power business model to evolve and support more sustainable operations.

Private public partnerships (PPPs) are increasingly recognised as a solution to municipalities lacking the capital to fund and modernise their energy initiatives. The private sector, which is able to absorb risk and offset costs for the municipality, can also be assured of generating return on investment. In turn, municipalities are able to fulfil their promise of reliable and efficient energy infrastructure to citizens and businesses.

The same principle applies where the private sector partners with technology vendors and absorbs the risks associated with new projects. This trend is being seen in the smart city movement where PPPs are reaping success in the US. These partnerships may also prove advantageous in the energy sector where alternative financing can address funding gaps.

“In the case of municipalities where there is a drive for energy modernisation, PPPs can help supplement power utility efforts and their balance sheets, and gear plans into action towards execution and completion,” says Meko.

Powering remote locations

Distributed generation together with the increasing availability of renewable energy such as solar, wind generation and battery storage, opens a new pathway for innovative power generation and transmission solutions. These DERs, when implemented, can complement ongoing traditional power generation projects and bring much-needed power to remote locations, support critical facilities, and help the African continent to create low carbon energy solutions.

Access to electricity can be furthered with the integration of microgrids. These small-scale electrical power grids have their own power generation systems that are connected to the load and in close proximity to the power generation site. Microgrids can operate independently or while connected to the national grid.

“Microgrids are generally small in scale compared to fossil fuel power plants but can be increasingly cost competitive – and do not hold requirements such as having to extend transmission grids. Microgrid designs can also eliminate the need for studies such as environmental assessments that can prove to be costly and delay access to power,” explains Meko.

Reduced costs

Costs are also reduced by the localised power generation that is generally in close proximity to the load. Furthermore, unlike large scale projects, microgrids can take as little as 36-70 months to complete.

According to Meko, microgrids offer an opportunity to provide easy access to electricity – however, there is yet to be a business model that is embraced by power utilities. Current models are usually driven by independent producer programmes that can then enter into a PPA where electricity is sold to government.

“The opportunity to expand these energy innovations into Africa is immense,” says Meko. He adds: “The cost and schedule advantages of small DER systems are beneficial for regions requiring capital and experiencing project delivery and schedule delays.”