

Smaller grids may be better to power Africa

By [Karel Cornelissen](#)

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[Research](#) by the World Bank indicates an estimated \$100bn in infrastructure investment is needed to close the electrification gap in Africa. Additionally, a [survey](#) by Grow Africa among companies already invested in Africa, has shown that dissatisfaction with the quality of physical infrastructure, including stable electricity supply, was one of the most prominent challenges hampering further investment in other areas of the continent's economy.



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By now it should be clear that various projects over the last 40 years to bring big scale electrification to the continent have largely failed. It is hardly surprising given the challenges that infrastructure faces in Africa. Investment in large-scale generation projects is still far from ideal and the distances between power plants and the communities that require a grid connection make transmission incredibly challenging.

Electrical losses along lengthy transmission lines remain significant. In South Africa alone, the [total distribution losses](#) amount to an estimated 8.4%, meaning that nearly a tenth of the electricity being generated is wasted on transmission. In the rest of Africa, this percentage is even higher.

Decentralised utilities

The obvious solution is to decentralise utilities. Micro-grids are already viewed as an ideal solution to bring power to regions without access in a quick and cost-effective way, but many still believe that these solutions can only succeed if they form part of a strategy to eventually connect them to a national power grid, fed by large-scale coal or nuclear power plants.

However, one can make the argument that the notion of large-scale power grids should be abandoned completely. Renewable energy in the form of wind and solar power generation has exponentially reduced in cost since 2006, and solar generation, for one, is on track to match coal generation in terms of cost by 2020.

Renewables and micro-grids

Renewable energy such as solar and wind also provides the one advantage that will make these micro-grids sustainable as permanent solutions (instead of as temporary fixes): They are considerably more cost effective to scale down, meaning that small-scale generation can still be economically viable.

Micro-grids - supported by renewable solutions - have the potential to become the building blocks of a rapidly growing power grid in areas where electrical demand has not yet reached the critical mass required for large-scale generation. In addition, new generation facilities of any scale, effectively fast tracks further economic development, which again facilitates more investment in a region.

Lastly, the only challenge that remains to be addressed is the issue of energy storage. Even in Africa, where sunlight and wind are abundant resources, it is still not yet possible to generate energy 'around the clock'.

Batteries and other energy storage solutions remain too expensive to make their use economically viable. However, just like the evolution of renewable energy, the cost of storage is decreasing at an exponential rate and we estimate that self-sufficient micro-grids with battery storage solutions will be cheap enough to construct in their entirety within the next five years.

An Africa that is not one big power grid, but rather a collection of localised power distribution hubs, operated by the communities that need them, may be the only viable way to solve our continent's energy crisis.

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