

Making music and electricity with new Spark invention

By spending \$40 billion a year until 2030, African governments hopes to meet the African Union Agenda 2063 decree of universal electrification. Social entrepreneurs, like musician Sudha Kheterpal and the Spark electricity-generating musical instrument, are stepping in to help bring that goal a little closer.



The Spark

The African electricity grid produces less electricity than Spain. Across the continent, power is inaccessible to most of the population, and where it is available it is unreliable and prohibitively expensive.

Access to electricity gives Africans the chance of a better education. The ability to charge a cellphone gives rural populations access to medical care. A lack of energy means students strain to read after dark, business comes to a standstill and clinics struggle to keep vaccines over long periods.

In Kenya, where 75% of the population live without access to electricity, a new start-up is generating clean energy using the power of music.

Sudha Kheterpal, percussionist with English dance electronica band Faithless, has created a percussion shaker called Spark which, when shaken for 12 minutes generates an hour's worth of light.

The world's first clean electricity uses simple technology: a magnet moving through a coil as you shake it, generating power

that is saved in the inbuilt battery. Users can use the stored power to provide light or charge a cell phone.

For Kheterpal, the Spark is also about the power of music to unify people, and how a collective consciousness can help to create a sustainable future, she explained in a recent interview. "Energy poverty is the world's number one human and environmental crisis and it's our desire for every child living in the world to have the opportunity to change their life. Through Spark we can teach children that interconnectivity is the way to our future and the key to the wellness of our planet."

The Spark is both educational and functional. It can be easily taken apart to teach kids about the principles of the kinetic energy used to generate power. Kheterpal believes that, "it's the learning and the technology together that's going to make the biggest impact."

Watch Kheterpal explain how she came up with the idea for her innovation:

Africa's electricity shortage

Africa's total power capacity is 147GW, which is what a country like Belgium produces and what China adds to its grid every two years. Remove South Africa from the equation and, as Bill Gates pointed out to Quartz Africa, the amount of electricity available per person is lower today than it was 30 years ago.

The African Union Agenda 2063 talks of universal electricity access by 2030. This would require an additional 250GW of power to be generated with an annual investment of \$40 billion. Rentia van Tonder of Standard Banks Power, Corporate and Investment Banking division believes that small scale renewable energy projects are the answer to electricity poverty in Africa.

"Potential in renewable energy in Africa is unbelievable. I think renewables are absolutely key," Van Tonder told Anadolu Agency recently.

From an investment point of view, Van Tonder pointed out that renewable energy projects can be scaled to needs. This would make it easier to obtain finance, and projects can be scaled up when economic activity requires added capacity.

Small scale local solutions would bring electricity closer to communities in need faster, and would increase their ability to rise out of subsistence. Renewables as part of a system that uses batteries to store generated energy are an even better solution, according to Gates, adding that "If you want to tell people to come and build factories and have jobs, it's not going to come where you say 'Oh yeah, this factory works when the wind is blowing and otherwise it shuts down'".

Niall Kramer, chief executive of the South African Oil and Gas Alliance, told Anadolu Agency that different energy generation sources have strengths that should be exploited. "They are intricately interwoven. For those short-term issues around electricity, many people are looking at renewables but you need to work towards the short and long-term solutions."

Renewable energy

Kramer added that renewable energy would not solve all of Africa's energy needs. Despite the advances in green technology, power generated is still intermittent. "When the sun isn't shining and the wind isn't blowing, you are going to need hydrocarbons to deal with that intermittency. It is a fallacy for people to think that the renewable industry and hydrocarbon industry are in competition with each other."

The South African government has begun to embrace renewables. Its new energy policy – the 2010-30 Integrated Resource Plan - foresees 17 800MW of power generated by renewable sources, and has been internationally acclaimed. South Africa's renewable energy sector is considered a global leader, "a flagship public-private partnership model for SA and the rest of Africa" according to the World Wildlife Fund.

But the country's aging transmission infrastructure is not fully able to add this new power to the grid. Between 2019 and 2022, when renewable power producers are fully operational, Eskom will have to invest R11 billion to upgrade its connections.

Small scale renewable projects do not need to connect to the national grid, Van Tonder points out. "(These) type of models change the lives of small communities, especially where there is no grid connection or possibility of reaching a grid."

Van Tonder underlined this point. In rural communities wind, solar and hydro are the most advantageous. They can be rolled out quicker and at a lower cost. "Renewables may make sense for countries if they want to expand quite quickly and at lower prices than two years ago."

Africa, as a whole, is starting to leapfrog older power generation technologies and reduce the need to extend power grids to unserved communities.

Renewable energy projects across the continent – Kenya's geothermal Olkaria plant; the solar Ouarzazate complex in Morocco; and the Grand Ethiopian Renaissance Dam among others – are delivering social and economic benefits. Electrification is helping to improve public health services, allowing students to study and opening up business opportunities on a continent of entrepreneurs.

However, there are 621 million Africans who, according to the African Development Bank, remain disconnected from the power grid. Electrification can sometimes take up to three years between 'turning ground' to 'lights on' for even the smallest renewable projects. So there remains room for social entrepreneurs like Kheterpal and her Spark project to continue making small significant changes.

Appropriately, the Spark electricity-generating device is shaped like a flint stone, a perfect symbol for the creation of new energy. Inside, the Spark resembles the chambers of the heart, which Kheterpal calls "...the seat of power for the human body, a symbol of strength and courage, and what connects us all as a global community."

Watch this BBC documentary on electrifying Africa:

Source: [Media Club South Africa](#).

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