



Solar Energy Benefits Education and Research in Africa

In this issue

Call for Papers
EDUCATION, SCIENCE
AND INNOVATION - The
e-AGE 2017 Conference
Cairo – Egypt, 3-4 December
2017

3

It is hard to imagine that in our technologically advanced society there are people without electricity, but this is exactly what happens in many parts of Africa.

With many remote regions and an unstable electrical grid, the science and education made possible by National Research and Education Networks (NRENs) are often in jeopardy. Solar-powered batteries might just be the solution.

Electricity, education, and research in Africa

It is estimated that millions of families in Africa are without power, and the policies the government must enact to make electricity more available are slow

in coming. Finding a viable and economical way to connect everyone to the grid has been a challenge.

Electrical service disruption directly affects Network Operating Centers (NOCs), network Point-of Presences (PoPs), research institutions, and students throughout the continent.

“Information and communication technology (ICT) services define our daily lives,” notes Stein Mkandawire, chief technical officer for the Zambia Research and Education Network.

“Funding standby generators for daily running of NOCs, PoPs and institutions is required, and that results in high service provision costs.”

Even in less remote locales with an electrical infrastructure in place, blackouts occur frequently. The net result is an extreme hindrance for the scientific and educational projects underway in Africa.

“Power outages often worsen the challenges faced when establishing NRENs in Africa because periods where power mains fail in excess of two days are still common,” says Isaac Kasana, CEO of the Research and Education Network for Uganda (RENU).

“Failure is so repetitive that the mains-charged battery systems are unable to sustain sufficient levels of operating autonomy to prevent site power shutdowns from occurring.”

Power outages not only affect a specific site or campus but also the connectivity of other linked

campuses. For instance, RENU’s network follows a sub-ring topology with typically eight or nine daisy-chained campus networks.

Multiply that by the number of researchers, teachers, students, and communities depending on ICT services, and the fragility of the enterprise becomes apparent.

In the face of these challenges, NREN engineers are looking to solar power as a way to sustain electricity during frequent blackouts.

Harnessing solar power

Being able to tap into solar energy for electrical power works best when there is a way to store that energy. In the past, batteries have not always worked as well as they should.

But with advances in technology, solar-powered rechargeable batteries now make renewable energy systems reliable and viable.

“Many African countries have plenty of sunshine which can be used as alternative source of energy, so solar energy is a means to sustain the NRENs in times of blackouts,” says Mkandawire.

Since most days have sufficient periods of intense sunshine, this would ensure near-continuous solar charging. When tied into a hybrid-charged power system, batteries can greatly enhance NREN resilience.

“For up-country campuses and rural-located research stations (such as the NIH station at Rakai), solar-charged batteries may provide the most cost-efficient means of powering

connectivity and other ICT equipment, says Kasana. “This will increase an NREN’s national coverage by enabling the connection of remote research stations and enhancing access for researchers who have to be based at such remote sites.”

By supplying countries with a reliable source of power from solar, African NRENs can send a steady stream of services to institutions, research bases, and communities. This in turn, gives better access to learning materials.

The benefits of solar power

There are many affordable options for families

in Africa to bring electricity through solar power into their homes. Using apps on their phones and equipment they can buy at the store, they can power their homes for less than \$60 per year. Several places have already started using solar power - it provides electricity to areas that desperately need it, creates jobs, and furthers research and education.

An education is one of life’s most precious acquisitions. But without the resources needed to teach and learn, knowledge-creation stalls.

More information at:

<https://sciencenode.org/feature/solar-energy-benefits-education-and-research-in-africa-1.php>

Call for Papers

**EDUCATION, SCIENCE AND INNOVATION - The e-AGE 2017 Conference
Cairo – Egypt, 3-4 December 2017**



CAIRO - The e-AGE conference had established itself as an important venue for networking among experts and scientists. In 2017, e-AGE will be held under the patronage of His Excellency Mr. Ahmed Aboul-Gheit, the secretary general of the League of Arab States in Cairo, Egypt during 3 – 4 December 2017. The main theme of e-AGE 2017 is “EDUCATION, SCIENCE AND INNOVATION”.

e-AGE 2017 will include events, workshops and meetings centered around the following:

- 10th Event on Euro-Mediterranean e-Infrastructure
- 7th Annual Meeting of ASREN
- 9th Annual Conference of the Arab Organization for Quality Assurance
- EUMEDCONNECT3 and Africaconenct2 Project Meetings
- Technical workshops on R&E networking

Moreover, special sessions will be dedicated to specific domains, mainly focusing on experiences in connectivity and e-Infrastructure, applications and services across a variety of scientific domains. It is also important to show how research infrastructure creates tangible benefits to communities and collaborations. It is still critical to demonstrate how research connectivity can promote collaboration and innovation. Different discussions will be stimulated during e-AGE to drive outcomes and concrete results on practical steps towards developing a regional e-Infrastructure.

Authors are invited to submit full papers reporting on their original and unpublished research in e-Infrastructures and computational and data-intensive sciences. All papers will be peer-reviewed and accepted papers will be published in the conference proceedings.

Topics of interest include, but not limited to:

- Scientific computing and data-intensive e-Science in the scientific areas related to energy, environment, health, climate, water, agriculture, biology, economy, medicine, as well as in social sciences and humanities.
- Perspectives on NRENs, including challenges, operation, sustainability, funding, governance, business models, security and services.
- Problem-solving environments, Virtual Research Environments, Science Gateways and collaborative tools, applications and services
- Education and e-Learning Technologies, access to educational resources, repositories, libraries and contents, clouds, grids, parallel and distributed computing, and high performance computing.
- Internet technologies and trends, Internet of Things, Security, SDN and AAI.

For more details, please visit the conference website:

<http://asrenorg.net/eage2017/?q=Page/call-participation>

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