

WORLD

LIGHTING UP AFRICA

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WORLD | The shortage of power in Africa means that, when the sun goes down, there is no relief from the darkness. But now the World Bank has plans to brighten up the gloom. By Claire Soares ++ International development

When Thomas Edison invented the light bulb he vowed that electricity would be so cheap that only the rich would keep burning candles. Try telling that to today's residents of Africa, still making do with wax and wicks some 130 years later.

The Dark Continent nickname may have been coined by Edison's contemporary explorers, but in one respect the moniker is still accurate, as a quick glance at a night satellite photograph of the globe proves. While the lights of Europe and America twinkle brightly, Africa is swathed in a cloak of blackness.

In Sierra Leone, the UN war crimes court is praised as much for lighting up one area of the capital Freetown, as for its justice. In the dilapidated Guinean capital, Conakry, young men flock to the airport of an evening, perched on bollards to cram in after-dark exam revision in the one place with constant lighting. And in the desert expanses of eastern Chad, families gather together for a meal by moonlight.

Even in Africa's most cosmopolitan cities – Johannesburg, Nairobi and Dakar – where the electricity grid is well-established, power cuts are a common aggravation, with neighbourhoods suddenly plunged into darkness. To counteract this, the clatter of back-up generators has become a familiar soundtrack to life in the wealthier suburbs.

Development experts have long fretted about the knock-on effect that power shortages have on the continent's ability to haul itself out of poverty. Put in simple human terms, an estimated half a billion people do not have any electricity whatsoever. "There is not enough time in the day to extend the electricity grid," says Russell Sturm, an energy expert for the International Finance Corporation (IFC), the private sector investment arm of the World Bank. "We need a more immediate solution."

It is with a view to plugging the gap that the World Bank is set to unveil its Lighting Africa initiative. The target is to get 250 million Africans supplied with clean-energy lighting by 2030.

Many of the continent's poorest people are dependent on kerosene lamps or candles, and typically spend at least a 10th of their income on lighting their shacks. The lamps often kick out more smoke than light, and there are frequent stories of huts going up in flames as they get knocked over. People with a bit of extra cash may invest in a small diesel generator, but the extra illumination and the reduced danger does not quite compensate for the noise and the polluting fumes. The future, according to the World Bank, is LED lighting. In the UK, LEDs (light emitting diodes) are more commonly thought of as the tiny red and blue dots of light on household remote control units, but the new generation of LEDs give out useable white light. And these devices could help switch on the lights in Africa, in the same way that mobile phones have changed the continent.

"When the cellphone arrived, suddenly it made no sense to wire countries up to the landline network," says Mr Sturm. "I think you can have the same impact with LED lighting."

LEDs are very efficient, in that they use a very small amount of power (typically one watt) but produce enough light to read by. They can also be recharged with mechanically-operated chargers such as hand cranks or pedal power, which makes them particularly suitable for African villages far from the grid.

Energy experts say that with the slow uptake of electrification, LEDs are good for the short term. "There's definitely room for targeted rural initiatives. They are starting from such a low base. In rural areas, we are talking about a 2 per cent access rate," explains Anton Eberhard, a former electricity regulator and professor at the University of Cape Town.

The World Bank and its IFC private investment arm has a pot of \$12m (£6m), which will serve primarily as seed money to grow the ideas of interested businessmen and entrepreneurs.

"The technology is already out there ... but what the World Bank can do is use its muscle to drum up interest and do this on a very large scale," says Walt Patterson, author of the recently-published *Keeping The Lights On* and a fellow at London's Chatham House. Lighting Africa officially launches on 4 September, when organisers will unveil a competition for the design and delivery of low-cost, green lighting products for low-income consumers in sub-Saharan Africa. More than 350 companies have already expressed an interest – from Africa-based small businesses to multinationals like Philips.

Perhaps key to the appeal, is the World Bank calculation that the so-called "energy poor" in Africa spend about \$17bn each year on fuel-based lighting. "It's a sleeping giant from a market perspective," says the IFC's Mr Sturm. "The poor, even the poorest of the poor, can be a profitable market."

Again, the parallels are drawn with mobile phones. In Kenya, for example, mobiles rocketed from almost zero to nearly six million users in the decade since the technology was introduced. It will be in the first wave of countries that Lighting Africa will target, along with Ghana, Tanzania and Zambia, before the project is rolled out more widely.

"We're working with manufacturers to bring down the costs of LED lighting ... and then the real challenge is on marketing and finding the avenues to distribute these products," says Vijay Iyer, an energy specialist at the World Bank.

For the fisherman plying the waters of Lake Victoria, that day cannot come soon enough. The men work at night, using lights to attract shoals of fish to the surface before trapping them in nets. Currently they use kerosene lamps, spending \$1,000 a year on fuel. But with an LED light, they could eliminate that expense and pocket more cash to feed their families and send their children to school. And those children could study at night, improving their grades and, so some development experts believe, help raise the educational standards.

The other major benefit of better lighting would be better security. In some of the continent's crime-ridden slums, women cannot walk at night for fear of being attacked and some stallholders refuse to stay open after dusk for fear of being robbed. With fewer shadows for criminals to lurk in, the streets could become safer.

While the Lighting Africa initiative could make a real, immediate difference to the lives of many, experts including Professor Eberhard warn that it should not distract attention from the wider problem of generating more electricity for the continent. "In my view, probably the most critical challenge is getting power to businesses so they can power the economy," he says. Take Nigeria. Despite being the world's eighth-largest oil exporter, power is such a problem that the National Electric Production Authority (Nepa) is known as Never-Ever Power Always. Thirty years ago, Nigeria had 79 generating stations, now only around 15 are still working. The frequent power cuts – or "lights out" as they are called locally – mean companies have to invest in generators. That electricity costs around 10 times that of the grid. It is a burden on small businesses, not to mention a turnoff for outside investors.

The World Bank estimates that lack of reliable power is clipping more than 2 per cent off the annual growth rates of the worst-hit African countries.

There are moves afoot to crank up the power. The idea of bio-fuels is catching on, with production experiments taking place in many countries. South Africa has started constructing the continent's first ethanol plant, and the Senegalese President Abdoulaye Wade has created a new ministry devoted to biofuels and renewable energy.

It is early days, however, and with solar power still too costly to be able to harness the power of African sun, it is hydropower that is seeing the most investment – although critics worry about the environmental impact and the fact that the rainfall is too variable.

In Uganda, however, the government has finally given the green light for a 30m-high dam on the Nile just below the favourite white-water rafting hangout of Bujagali Falls. An international consortium is pumping £400m into the hydropower project, the biggest-ever foreign investment in east Africa. Similar dams are planned for the Niger and Volta rivers.

Without doubt, the most powerful weapon in Africa's electricity arsenal is the river Congo, which sends 42.5 million litres of water pouring into the Atlantic every second – a flow second only to the Amazon.

The idea of a huge power plant on this river has been described by some as a "Marshall plan for Africa". The 40,000 megawatts of potential electricity from the so-called Grand Inga, would be more than twice the projected capacity of the Three Gorges Dam in China, and could literally light up the continent. But it comes with a giant price tag – \$40bn compared to the \$12bn spent on infrastructure in sub-Saharan Africa since 1985. And on top of that the Democratic Republic of Congo is still recovering from a civil war, and is a long way from shaking off its reputation as "corruption central". All in all, it looks like it could be some time before the African joke – "What did we do before we used candles? We had electricity" – becomes obsolete.