Africa's midnight sun

A simple solar lantern could change life for millions without electricity

DAVID WAIRIMU can finally do his homework. An innovative solar-powered lantern allows him to carry on working when it gets dark. "My position in class is much better since we got it," he says. David, who is 14, lives with his mother Margaret in a mud-walled hut in Engashura, near the town of Nakuru in Kenya.

Electric lights gleam in Nakura, but Kenya's ramshackle electricity grid does not reach 90 per cent of the country's homes, including those in Engashura. Until last January, the family's only light at night was a hurricane lamp burning kerosene. "It was too dark to read by," says David, who proudly displays his new hand-held lantern and points out the cable connecting it to the solar panel on their thatched roof. "We recharge during the day, and that provides electricity for an evening's light," says Margaret.

The Glowstar lantern is the brainchild of a British non-profit consultancy called Intermediate Technology Consultants. After trials in Kenyan homes, the lamp was launched commercially this month. The hope is that it will do for rural African lighting what the clockwork radio has done for its listening--provide a cheap, reliable, ecologically friendly product that does not require mains power, expensive batteries or kerosene.

The solar lantern kit, which costs around £70, is a purpose-built sealed unit containing its own rechargeable battery. What makes it unique is a new type of microchip charge regulator. Its designer, Kieron Crawley, says the regulator will be the key to its success, where other attempts to harness solar power have failed. Around 150 000 Kenyan households have tried using solar panels to charge up car batteries and run portable TVs and lights, but many have abandoned the equipment as batteries became exhausted owing to the use of poorly designed charging circuits.

ITC's microprocessor based charge-control circuit housed inside the lantern constantly monitors the battery to ensure it remains charged. At night it will switch the lantern off rather than allow the battery to go flat, and it can control how much solar energy is conveyed from the solar panel to the battery during the day. "Existing systems don't do this effectively," says Crawley. "As a result, performance gradually drops off and within six months the system is dead."

There have been teething problems during the lantern's pilot phase. "When the battery runs down the chip loses its memory and the whole thing has to be reprogrammed back in the UK," says Bernard Osawa of Nairobi consultancy Energy Alternatives, which has audited the pilot.

But Crawley is confident the problems have been sorted out. Few doubt that solar power has massive potential in rural areas of the developing world that are excluded from national electricity grids. After all, millions of children like David are waiting to do their homework.

Fred Pearce

From **New Scientist magazine**, 22 July 2000