THE £2 LIGHTBULB WHICH LASTS 60 YEARS

IMPACT!

A new way of producing gallium nitride (GaN), developed with EPSRC support, could produce energy saving LEDs for a tenth of the current price.

↗ 100,000 hrs
is the average time a GaN LED can burn for. It only needs replacing after 60 years.

↗ 15%
GaN lighting could cut UK electricity consumption by 15 per cent.

GaN, grown in labs on expensive sapphire wafers since the 1990s, can now be grown on silicon wafers. This lower cost method could mean cheap mass produced LEDs become widely available for lighting homes and offices in the next five years.

IMPACT ON ENERGY AND THE ENVIRONMENT

- A GaN LED can burn for 100,000 hours on average, it only needs replacing after 60 years.
- GaN LED lights in every home and office could cut the proportion of UK electricity used for lights from 20 per cent to 5 per cent.
- Unlike currently available energy-saving bulbs GaN LEDs do not contain mercury so disposal is less damaging to the environment.

LONG TERM IMPACT OF GAN

Cancer surgery

Currently, it is very difficult to detect exactly where a tumour ends. As a result, patients undergoing cancer surgery have to be kept under anaesthetic while cells are taken away for laboratory tests to see whether or not they are healthy. This may need to happen several times during an operation, prolonging the procedure extensively. But in the future, patients could be given harmless drugs that attach themselves to cancer cells, which can be distinguished when a blue GaN LED is shone on them. The tumour's edge will be revealed, quickly and unmistakably, to the surgeon.

Water purification

GaN may revolutionise drinking water provision in developing countries. If aluminium is added to GaN then deep ultraviolet light can be produced and this kills all viruses and bacteria, so fitting such a GaN LED to the inside of a water pipe will instantly eradicate diseases, as well as killing mosquito larvae and other harmful organisms.

Hospital-acquired infections

Shining a ultraviolet GaN torch beam could kill viruses and bacteria, boosting the fight against MRSA and C Difficile. Simply shining a GaN torch at a hospital wall or trolley, for example, could kill any 'superbugs' lurking there.

IMPACT ON BUSINESS

EPSRC funds the Cambridge University based Centre for Gallium Nitride directed by Professor Colin Humphreys.

The Cambridge Centre for Gallium Nitride was established in 2000 and its research work is underpinned by EPSRC funding. The current grant amounts to around £1.6 million over three years.

The Centre's industrial partners include Aixtron, Forge Europa, QinetiQ, Sharp Europe, Philips, Semelab and RFMD. UK academic collaborators include Manchester, Oxford and Sheffield Hallam Universities.

For more information about EPSRC and the impact it is making visit www.impactworld.org.uk

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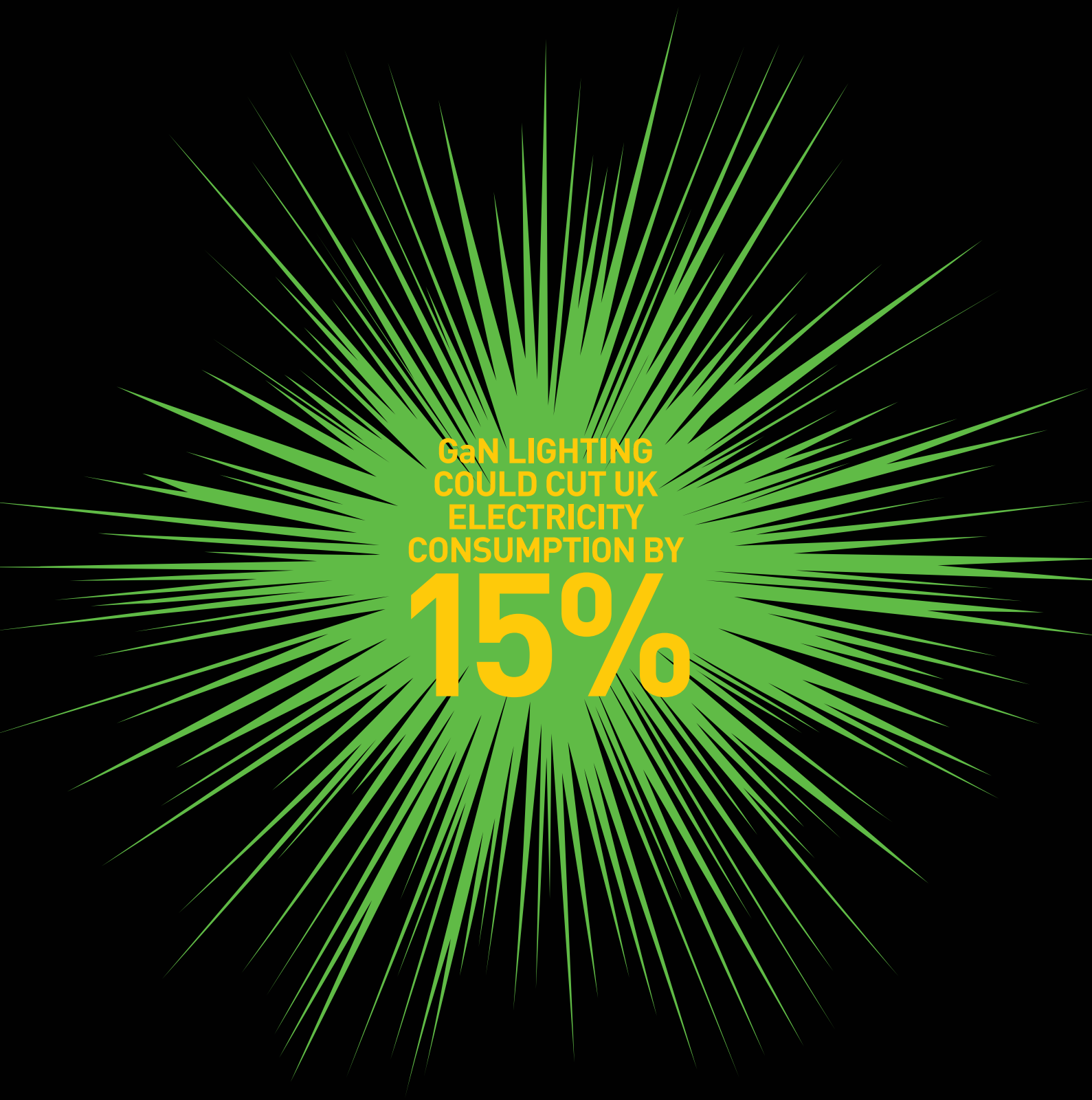

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