Video transcript: Custom film made for BBC iWonder, featuring Danielle George at the Royal Institution of Great Britain.

PROF DANIELLE GEORGE:

We take for granted how easy it is to switch on a light and pierce the gloom. The UN calls this a basic human right. But the technology most of us use dates back to the 1800s.

Worldwide, a fifth of all the electricity we generate is used for lighting. Now this gives us a hefty energy bill – but it also means we pump out three times more carbon dioxide than the entire aviation industry.

And the need for light is only going to get bigger, as our populations grow, modernise and move into cities.

Living in darkness isn't an option. But there's a development that could slash our energy consumption.

The traditional light bulb is actually a pretty hopeless way of making light. It takes loads of electricity to generate just a little bit of brightness.

LEDs or light emitting diodes have been around since the sixties but people are getting really excited about them now.

Breakthroughs in their design means that LEDs are real contenders to replace the wasteful filament bulbs in most places. And as LEDs use a fraction of the energy to create light, this simple electronic component could have a global effect.

Red image of bulbs in Where Next? step by Paul Wilkinson.