

F IS FOR FUSION

There are lots of reasons to be worried about the future. It is generally accepted that the activity of humans is causing lasting damage to this planet, and if we aren't careful, we're going to do so much damage that we won't even be able to live here ourselves. One of the main problems is that we consume so much energy – to power our cars and aeroplanes, to heat and light our homes, and to power factories to make plastic packaging that we throw away without a second thought.

The best solution would be to stop using so much energy. This is something we can all help with in our own ways. The hope is that with more and more people realising how serious the problem is, we can eventually bring down the amount of energy we use. But it may already be too late to solve the problem in this way alone.

Another solution is to find new ways of making energy (strictly speaking, you can't 'make' energy – all you can do is 'convert' it into a useful form), ways that don't fill the atmosphere or ground with toxic waste, and that won't eventually run out. Lots of progress is being made – more and more solar panels, wind farms and geothermal energy plants are being made. But it still might not be enough.

The Sun, just like every other star, is extremely efficient at making (or converting) energy. Deep inside the Sun, there are loads of hydrogen atoms, which are so hot that even the electrons get stripped away from them. Sometimes these bare atoms (called ions, see 'I') will smash into one another, and those two ions will combine to make one larger helium ion. Sometimes two helium ions will smash together to form beryllium, and so on. And with every collision, loads of photons are released, which make their way out through the layers of the Sun, and then out into space, and eventually some of those will hit Earth as the sunlight that gives us our energy.

Wouldn't it be great if we could have our own little mini-Suns to produce all the energy we need, down here on Earth? After all, we have plenty of spare hydrogen about.

Well, guess what – they're working on it. While researching this show, I had the pleasure of being shown around the Culham Centre for Fusion Energy, which has one of the biggest and best fusion power reactors on Earth. And I decided to write this song about it.

It's a folk song, with a funk middle eight, and I play it with a guitar technique called finger picking. And it was the first song that I wrote specifically for this show.



This photo was taken by William Ranieri