BBC Bitesize – Physics

Episode 8 – National and global energy resources

ELLIE: Hello and welcome to the BBC Bitesize Physics podcast.

JAMES: The series designed to help you tackle your GCSE in physics and combined science. I'm James Stewart, I'm a climate science expert and TV presenter.

ELLIE: And I'm Ellie Hurer, a bioscience PhD researcher.

JAMES: And this is the eighth and final, sadly, episode of our series on energy. If you haven't listened to the other seven, where have you been? Of course, you can go back, pause the episode, and come back to episode one and listen all the way through and get the most out of the series.

ELLIE: Alright, and with that, let's kick off our final episode where we'll be talking about renewable and non-renewable energy resources.

JAMES: This is a bit of me, this.

ELLIE: Yeah, this is your expertise.

JAMES: Yeah, I love a bit of non-renewables and renewables. Just so you know, while we're going to cover some of the key points in this one, we can't cover everything in one episode. We wish we could. So do be sure to head to the BBC Bitesize page and read the resources your school gives you, so you're fully equipped. Okay, let's begin.

ELLIE: Okay, so we've spent this entire series talking about energy and how we use it, but we haven't talked about where that energy actually comes from.

JAMES: Well, the main energy resources we use on earth are fossil fuels - things like coal, oil and gas, as well as other fuels like wind, hydroelectricity, nuclear fuel, biofuel, geothermal energy, the tides, the sun and water waves.

So, some energy is renewable, which means that it can be replenished as it's used. ‘Replenished’ means that you can restore that energy resource because it's always been created naturally.

ELLIE: For example, wind energy that's used to turn wind turbines and the energy we get from the sun that's used in solar panels.

JAMES: Yeah, whereas other types of energy are non-renewable. For example, nuclear fuel and the three fossil fuels, which are coal, oil and gas. That means that once they are used, we can't naturally recreate them at a pace quick enough to keep up with the human consumption. And that's sort of the problem.

As humans, a lot of the energy we use is non-renewable. Yeah, imagine a busy city at rush hour, there's lots of the cars on the streets that are powered by petrol and diesel. Now those aren't renewable and they do leave pollution in the air.

Yeah, they also, unfortunately, create high levels of carbon dioxide in the atmosphere which warms the planet and can cause changes in our weather systems, which, of course, is not good for any of us. Petrol and diesel are fossil fuels. They're made from crude oil, which is found in the Earth's crust. So once all that crude oil's been used up, we can't replenish it because there's a limited amount of it in the world. It's finite.

OK, I know what you're thinking – if they're not renewable, they're not good for the environment and we'll eventually run out of them, why do we still use them?

It's a great question. And simply, it's because we've been using them for centuries. And a lot of technology we use from things like our cars to heating in our homes was designed for them. So whilst the UK's energy does come from different sources, a lot of it comes from fossil fuels.

As we all become more aware of the effect we're having on the planet, people have started to redesign technology to use power in more sustainably. Scientists, just like Ellie and myself, and environmental activists have campaigned and created more sustainable ways to supply and use energy. Electric cars, lamp posts, fuel by solar power, cool stuff like that, wind turbines in the countryside are used to power businesses and factories.

But there are a lot of other factors to consider that make it difficult to switch to more sustainable options. For example, the costs associated with things like research and development and the fact that different countries need to come together and set sustainability targets that they agree on to use more renewable energy resources.

Also, there are other practical factors to think about. For example, the limited reliability of some renewable fuels compared to fossil fuels. For example, solar energy, well, you can't really rely on it in the winter.

ELLIE: We really do still have a long way to go, but more people are aware of the renewable alternatives they could use. And hopefully one day, using renewable energy will be just as easy as using non-renewable energy.

JAMES: Yeah, for example, in the UK, there will eventually be a ban on selling new petrol and diesel cars as the country pushes towards more hybrid and electric cars.

ELLIE: But you don't have to be a politician or have the money to buy an electric car to make a difference. You can try small swaps to make the way you use energy a little more sustainable too.

JAMES: Yeah, you could try walking or riding a bike to school instead of taking the bus. Or you could ask your school to use LED light bulbs instead of incandescent light bulbs in the canteen, for example.

ELLIE: You know, even if it's just a small change, everything you can do to be more environmentally friendly has a positive impact. So, take a moment to think about what you can do to make a difference.

JAMES: Yeah, and sometimes you feel like, I'm just one person, what difference can I actually make? A huge one!

ELLIE: Yeah.

JAMES: That is the answer. So, get cracking. Small differences, good way to start. Alright, let's recap the three key takeaways from today's episode then.

So firstly, some energy resources are renewable. That would be things like solar, wind and geothermal energy.

Secondly, other energy sources are non-renewable - things like coal, oil and gas. But we use them because they can sometimes be more reliable than existing tech. Although, that might change as tech catches up.

And lastly, non-renewable energy sources harm the environment, but more technology is being developed to make the products we use more sustainable.

ELLIE: And with that comes the end of our eight-part series all about energy.

JAMES: Oh, sad face. We really hope you found it helpful and if you didn't get the chance to listen to all these episodes, please do go back and really get stuck into them. There's some good stuff in there.

ELLIE: And again, thank you guys for listening to BBC Bitesize Physics. If you found this helpful, go back and listen again and make some notes so that you can come back to them when you revise.

JAMES: Whilst you're in the BBC sounds app, there's also the Bitesize Study Support podcast, which is full of tips to help you stay focused during revision and get the best out of your exam.

ELLIE: Good luck with all your exams, guys. You're gonna smash it.

JAMES: Yeah, and we'll see you again. Thanks for listening.

ELLIE: Thank you.

BOTH: Bye!