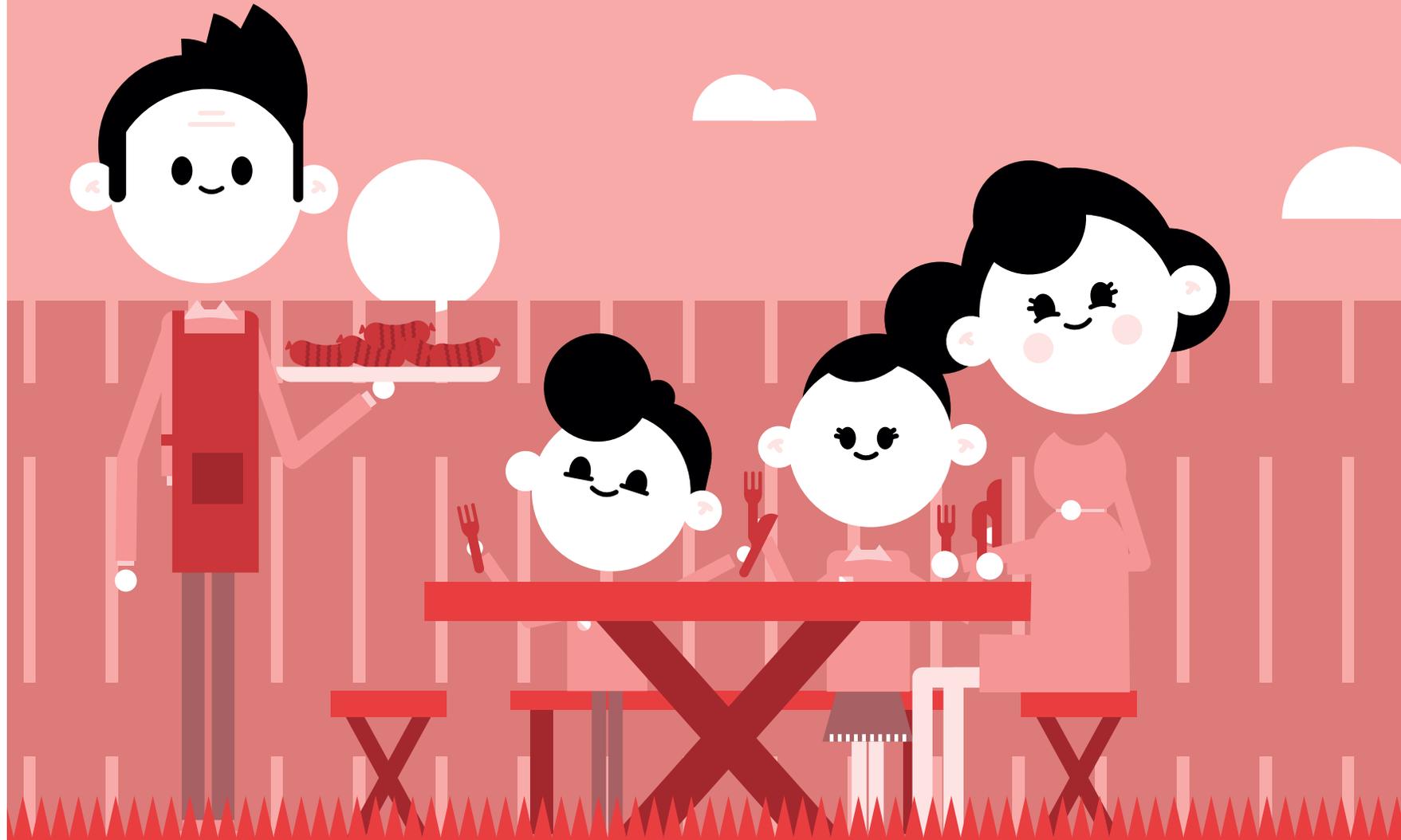




Future-ready
consultancy for
energy, water and
industry

Engineering your evening

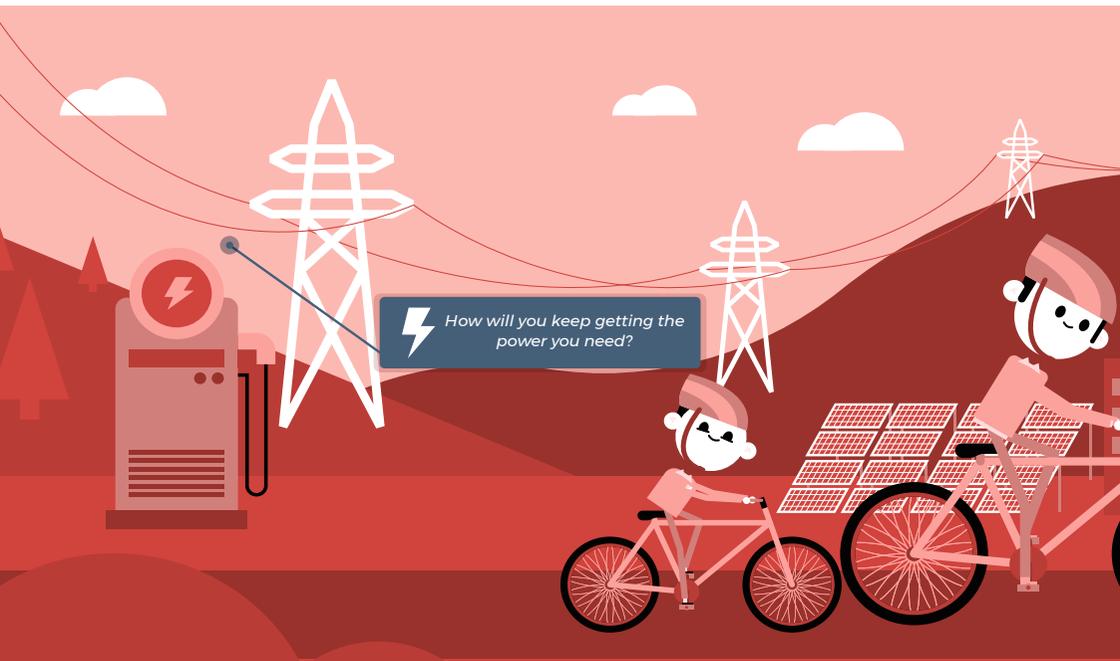
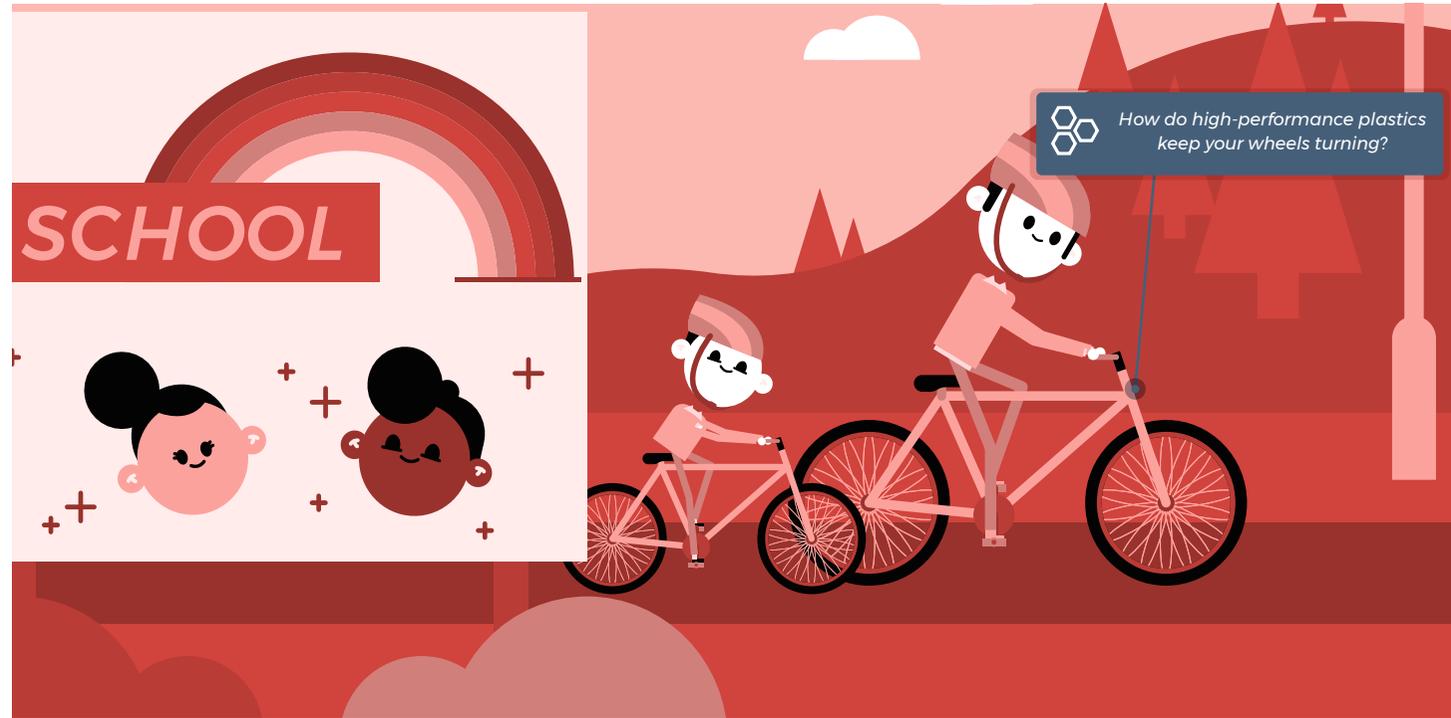
We spend our day working to ensure you have a good evening



Enabling high-performance plastics innovation

What have high-performance plastics got to do with everyday life? Well, special polymers are used to make strong, lightweight plastic components for everything from aeroplanes to bicycles.

As you might imagine, making these polymers is a highly specialised process. It requires unique facilities, such as the £10 million polymer innovation centre we designed for a leading manufacturer of high-performance plastics. The centre will enable rapid prototyping of new parts and components made from new types of polymer.



Transforming energy generation, transmission and distribution

How will you keep getting the power you need?

Whether it's for charging your electric vehicle or powering your smart home, modern life increasingly needs reliable low-carbon electricity. WSP is helping generation, transmission and distribution companies find innovative ways to power the future.

For example, with batteries now used in everything from cars to phones, there is more demand for DC, rather than

AC, power. In Glasgow, we are working with SP Energy Networks on smart transformers that can provide low-voltage DC power supply to consumers.

DC power is also more efficient and more controllable than AC. We're helping SP Energy Networks get more renewable energy from the island of Anglesey to the mainland by switching the connecting cable from AC to DC.

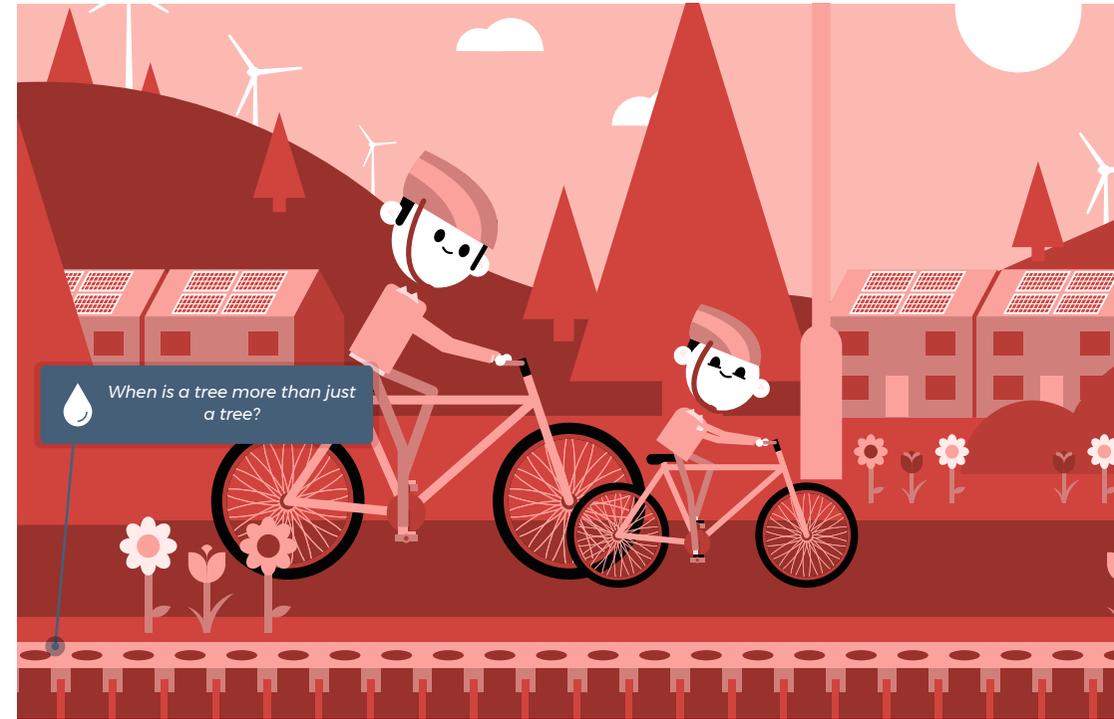
Making use of green infrastructure's natural benefits

When is a tree more than just a tree? When it's part of a green infrastructure design that brings multiple benefits for the city: reducing flooding, providing shade and cooling, and filtering pollution – as well as creating more attractive spaces that contribute to everyone's wellbeing.

Take the historic Merchant Quarter of Aberdeen, for example. Trees are an integral part of our

solution to managing drainage and flooding in the area. Planting trees in pits that retain water absorbs rainfall and stops it flooding into local properties.

While the trees make use of the water, evaporation helps cool the air. Their leaves provide shade, as well as filtering particle pollutants from the air. Thanks to the trees, the city is a better place for people and wildlife.



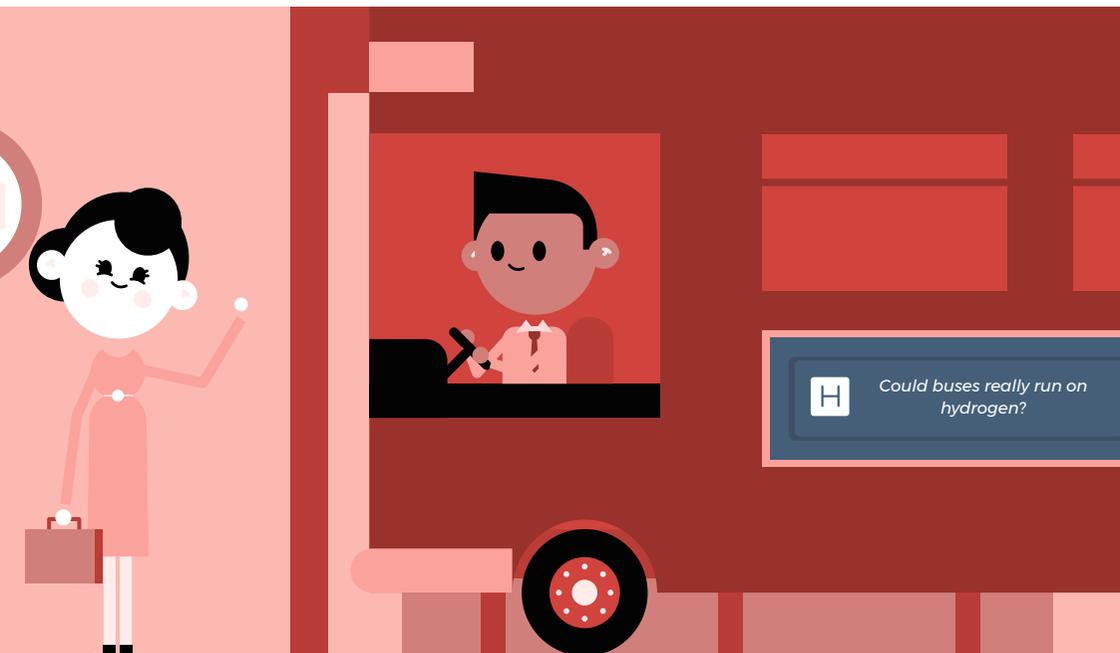
Fuelling the advent of hydrogen-powered public transport

Could buses really run on hydrogen? Yes, and in fact it's already happening across the UK.

London, Aberdeen and Birmingham are looking to reap the benefits of hydrogen fuel cells, which have a greater range than batteries and emit only water. Using renewable energy to produce hydrogen by electrolysis provides a sustainable solution for city buses.

We acted as owner's engineer for the Birmingham Bio Power plant, which will supply the renewable energy needed to produce hydrogen for buses. The plant, for which we reviewed the design and supervised construction, gasifies waste wood to generate electricity.

Next stop, hydrogen buses – with 22 vehicles taking to Birmingham's streets in 2019 as part of a £13.4 million trial.



Ensuring the quality of smart motorway construction

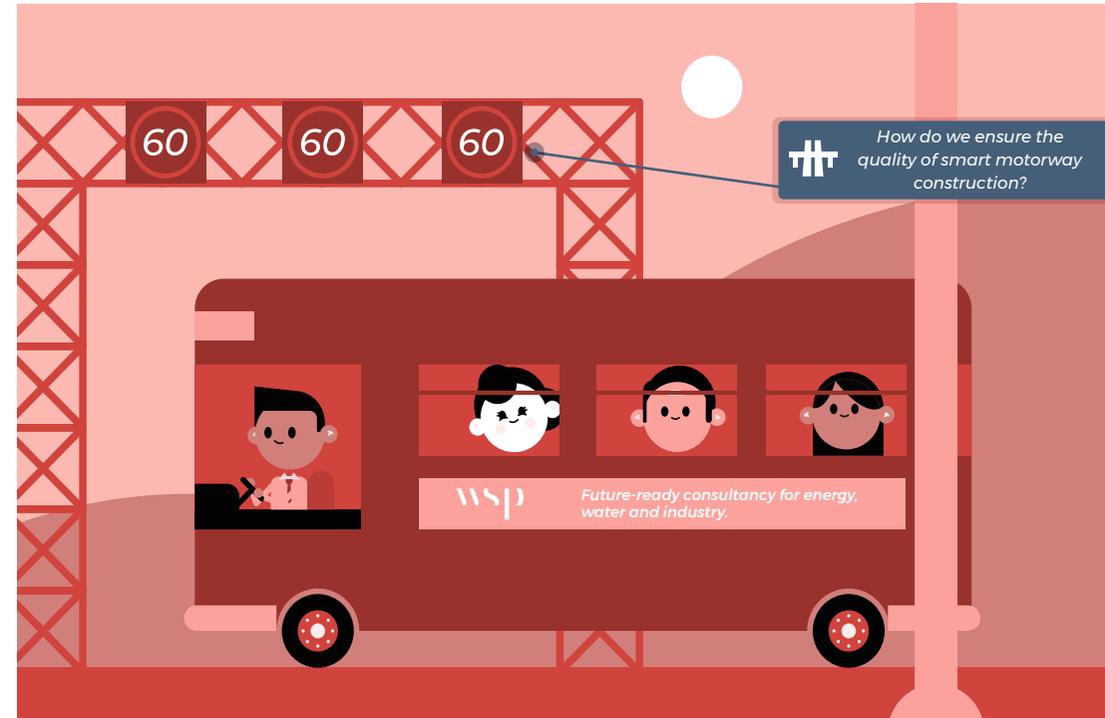
Smart motorways promise to transform travel, but who makes sure they're built efficiently and safely?

Acting as an independent inspection agency, our Quality Services team is auditing each of Highways England's smart motorway projects – from the M1 to the M62 – to identify improvements.

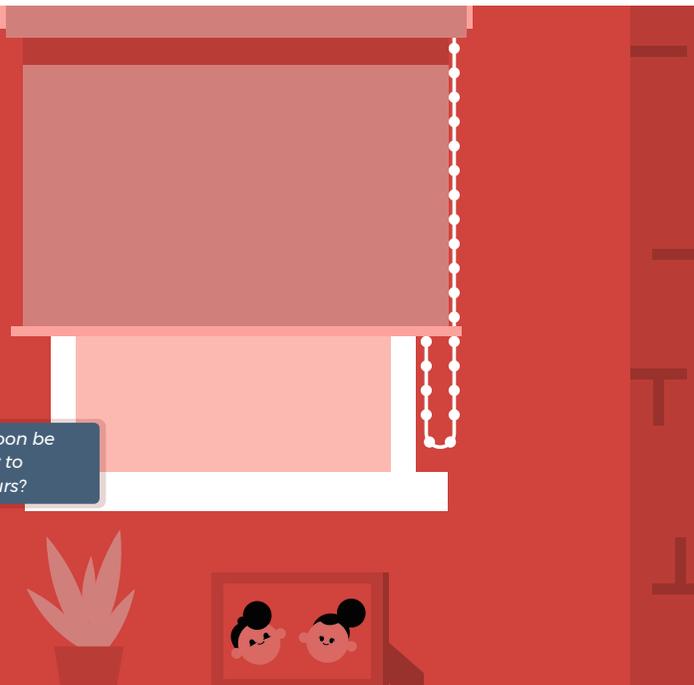
Have the sound barriers that reduce noise for neighbouring communities been erected

correctly and safely? If a digger has struck a buried cable – causing delays and endangering workers – how can this be prevented in the future?

By examining document management systems in forensic detail and carrying out technological audits, we are finding lessons that will ensure construction becomes more efficient, protecting people and the environment.



⚡ Will your house soon be selling energy to your neighbours?



Turning energy consumers into energy producers

Will your house soon be selling energy to your neighbours? The smart-home revolution could enable you to become both a consumer and producer of energy – a 'prosumer'.

You can already use your smartphone to control everything from your heating to your blinds. Energy trading is the next step in the digitisation of our homes.

In London, we're mentoring a company exploring how peer-to-peer energy trading could reduce customers' bills. Instead of exporting excess energy from solar panels on 13 blocks of flats to the grid, artificially intelligent hubs enable it to be traded within the community.

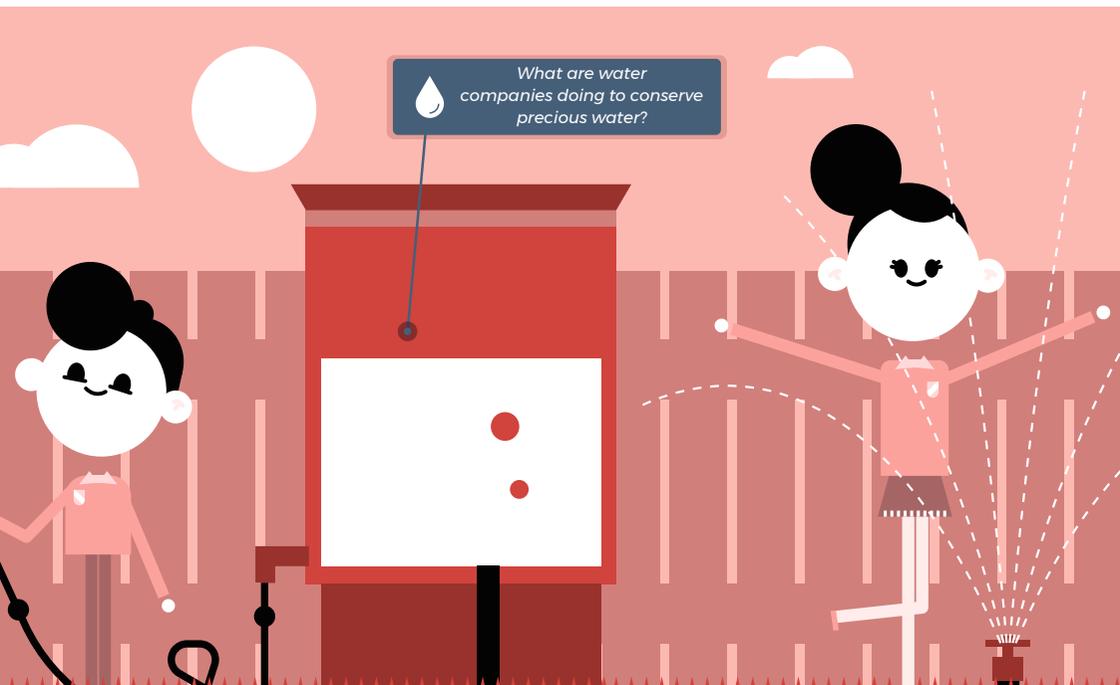
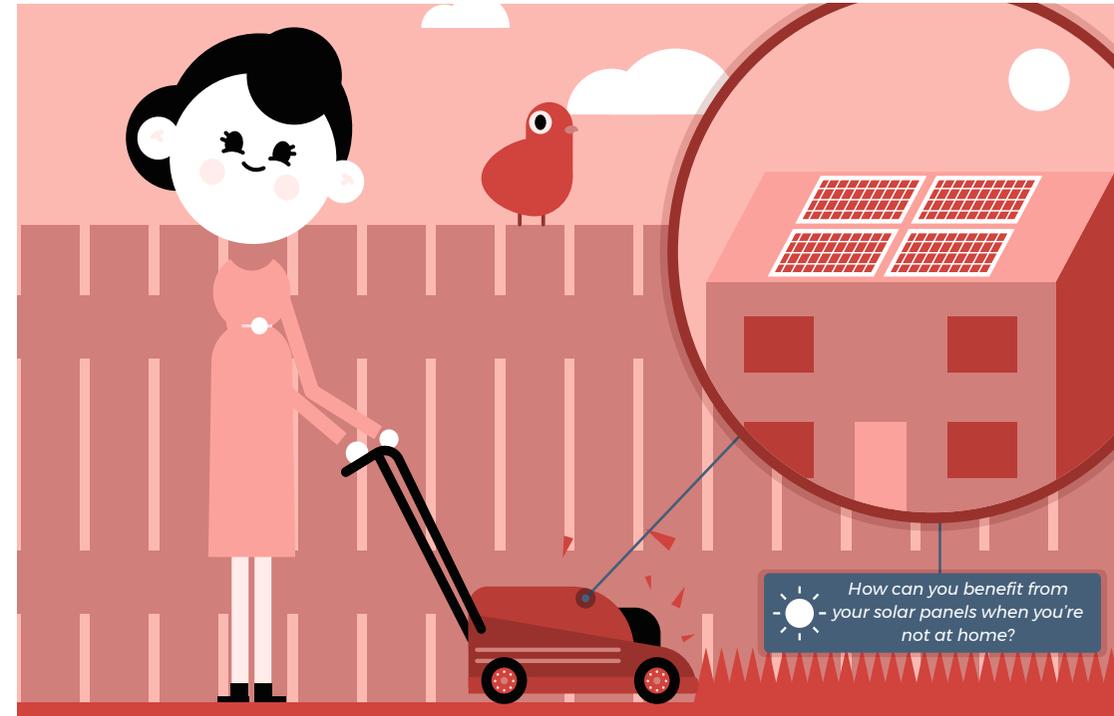
Integrating solar power and battery storage into homes

How can you benefit from your solar panels when you're not at home? Battery storage enables you to save the energy produced and use it later. As time-of-use charges are introduced (like a more complex version of Economy 7) it will also mean you can avoid peak-time tariffs.

Demand for electricity typically peaks when everyone comes home in the evening, puts the kettle on and turns on their televisions –

placing strain on the grid. If you use energy from your battery instead, you can bypass the grid and, potentially, pay less. In fact, some homes with solar panels and battery storage barely see their electricity meters move.

In Manchester, we've worked with a housing association to test the concept - integrating solar panels and battery storage into social housing.



Informing investment in resilient water infrastructure

While you do your bit to conserve precious water resources, what are water companies doing? Behind the scenes there's a lot going on.

Dŵr Cymru Welsh Water uses our hydraulic models of its distribution network, along with analysis of customer feedback and water quality sample data, to keep things running smoothly.

This sort of zonal analysis helps companies identify issues before they arise and make cost-effective investment where it's really needed. It helps to deliver a safe and reliable supply, saving water and keeping customers happy.

Ultimately, we're helping to ensure the system works smoothly 24/7, 365 days a year – without you having to give it a second thought.

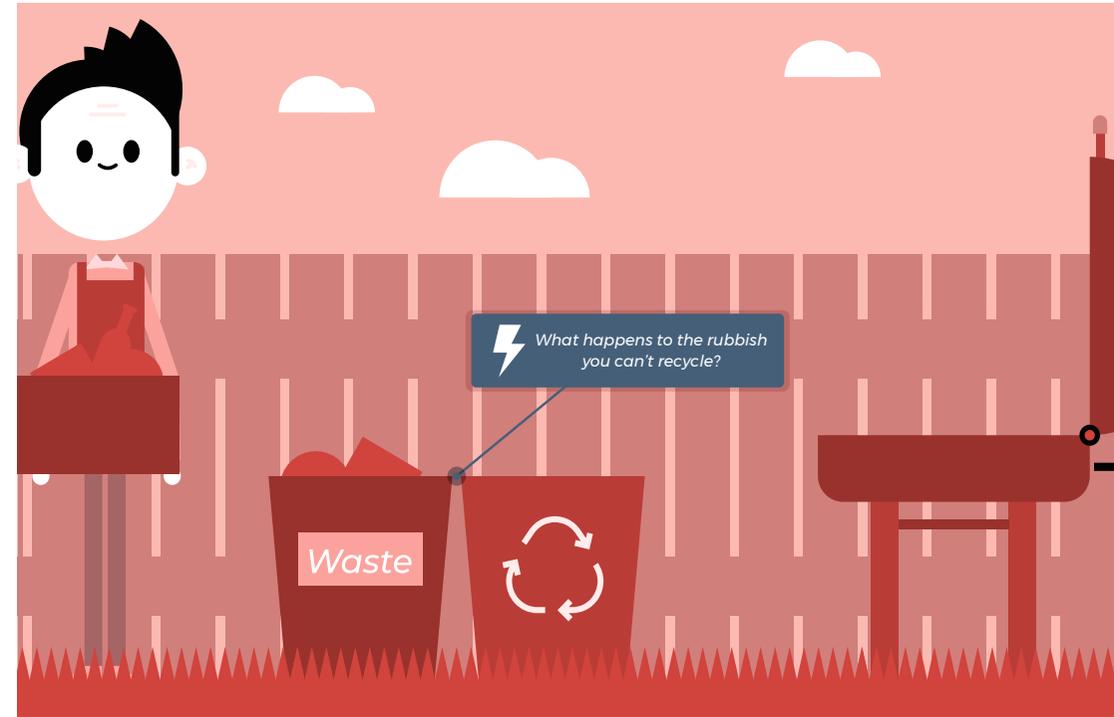
Finding new ways to generate energy from waste

What happens to the rubbish you can't recycle? The idea of dumping household refuse in landfill is being consigned to history as the UK gets more energy-from-waste plants.

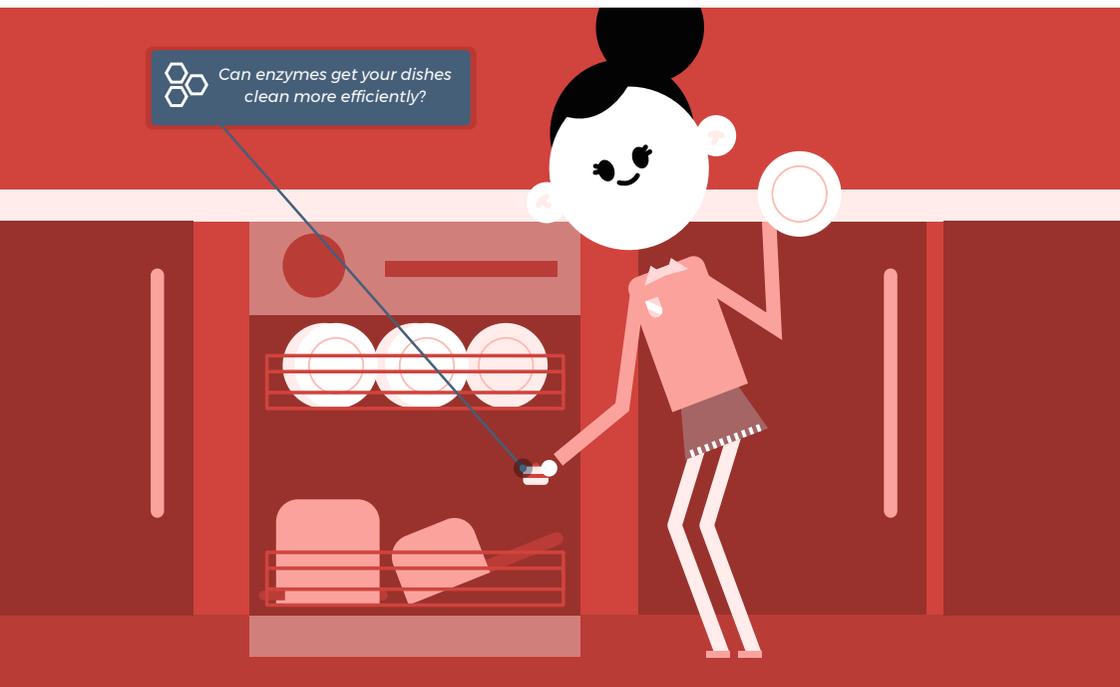
In Uskmouth, Wales, we're working with SIMEC Atlantis on a world first: converting an old coal-fired power station to run on energy pellets made from waste. Once converted, the giant 220MW plant will make use of existing infrastructure that would otherwise be demolished, and

safeguard employment in the area. It's a concept that could soon be rolled out across the UK and beyond.

In addition, we're working on smaller energy-from-waste facilities, such as those at Baddesley in Warwickshire and Bridgwater in Somerset. We also work on plants that use other technologies to convert waste to energy, including using gasification to produce synthetic gas.



Can enzymes get your dishes clean more efficiently?



Expanding the production of labour-saving enzymes

Where would we all be without enzymes? Doing an awful lot more scrubbing, for one thing.

The enzymes manufactured by one of our major industrial clients make life much easier when it comes to jobs like doing the dishes. An enzyme-powered dishwasher tablet eats through grease and grime, leaving you free to do something else.

And that's just one of a whole host of applications for enzymes. For example, they're also used in bread to help keep it fresh.

Not surprisingly, enzymes are in high demand and we've helped this biotech company expand its existing facilities across Denmark – adding capacity without disrupting operations.

Supporting customers to conserve water

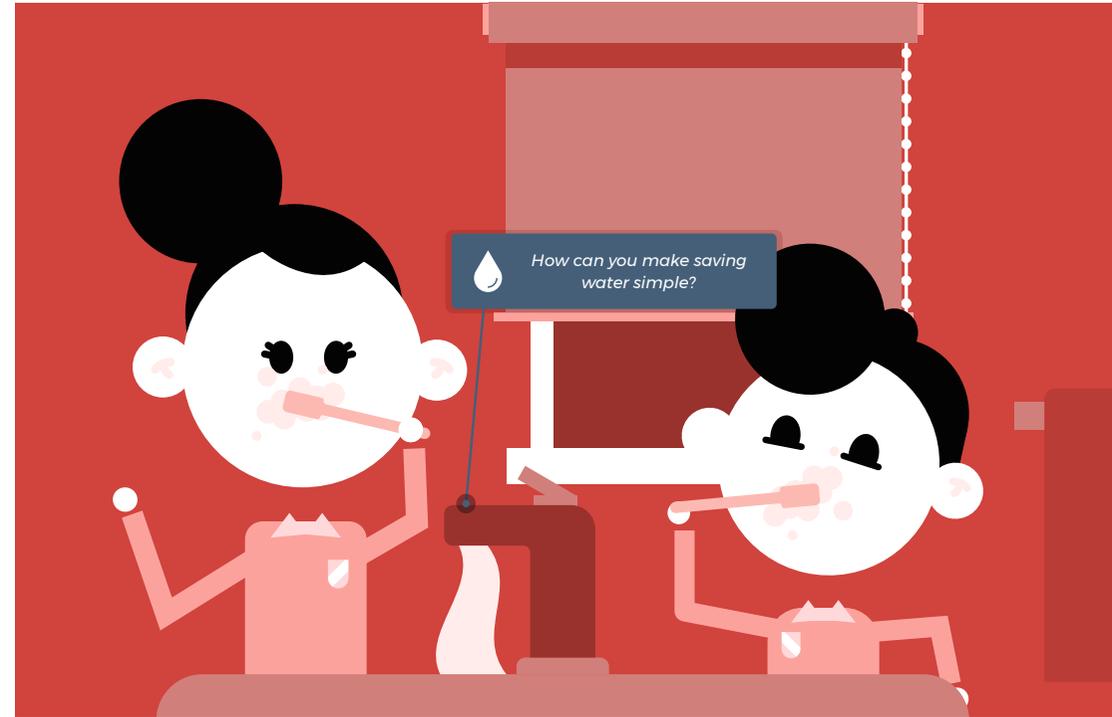
How can you make saving water simple? Finding easy ways to cut consumption can help conserve this vital resource for future generations – as well as saving you money.

We've been helping water companies engage customers for more than a decade – most recently supporting Essex and Suffolk Water's award-winning Every Drop Counts programme.

Customers can book a free visit from a plumber who will install water-saving

products such as low-flow fittings. They also learn how small, behavioural changes – like turning off the tap while you brush your teeth – can cut their water and energy bills.

In 2018, we engaged 17,031 customers and helped them save, in total, around 83 Olympic swimming pools full of water. That's an average saving of 39.8 litres per property, which is worth £35 per year.



Harnessing hassle-free heat from the ground

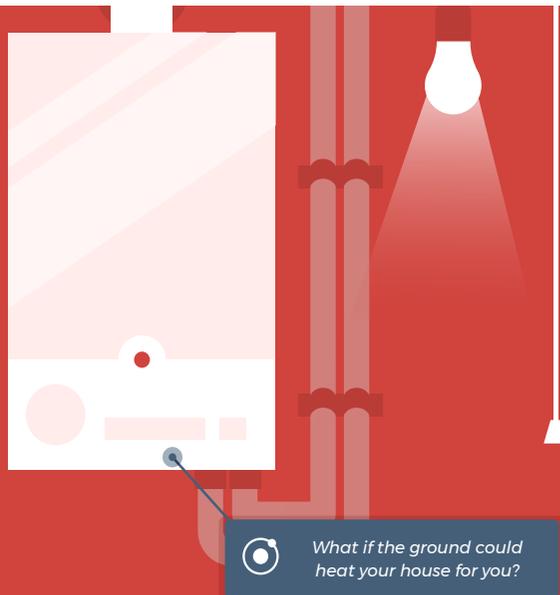
In the UK, even summer nights can be a little chilly. What if the ground could heat your house for you?

Open-loop geothermal systems use heat from the ground through boreholes without digging up large areas to lay the long lengths of pipe for traditional closed-loop ground-source heat pump systems.

All you need is two small boreholes a little distance apart – one to pump water

into and one to take it out from. The ground does the heating, so all that's left to do is run the water through a heat exchanger to warm the water in the building's plumbing system.

We've put this innovation into action at the Royal Festival Hall and the Tate Modern in London, and we're also developing it for a mixed-use scheme in Colchester and residential apartments in West London.





**Find out more about how WSP
engineers your evening at wsp.com/eye**

