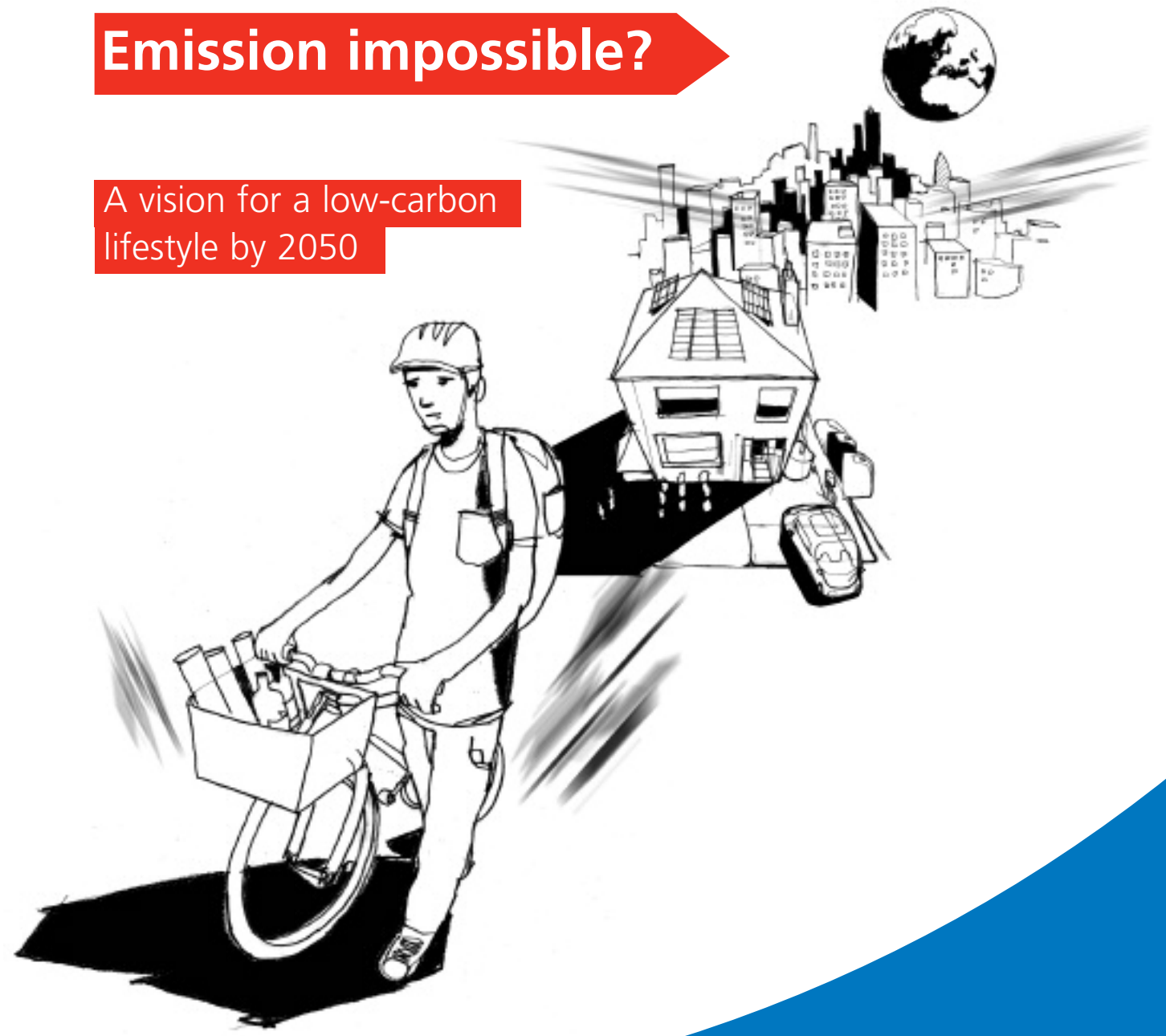


Emission impossible?

A vision for a low-carbon lifestyle by 2050



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Introduction

We need to reduce CO₂ emissions by up to 80% by 2050 in order to avoid dangerous climate change.

Personal carbon emissions – the emissions we all produce from our homes and our travel – account for around 43% of the UK total, or around 235 million tonnes of CO₂ (MtCO₂) a year.

An 80% reduction of these means we will need to save at least 188 MtCO₂ a year. This sounds like an impossible task: but it's not.

For it to happen, we need not adopt austere lifestyles or make unpleasant personal sacrifices. A low-carbon lifestyle could in fact improve the quality of all of our lives. We could have more comfortable homes and better travel choices, for example, at the same time as protecting our environment.

And although it often seems that only expensive or far-off technological breakthroughs can make a difference, a low-carbon future can be achieved with a combination of existing technology, bold policy decisions and the right personal choices.

'Emission impossible?' shows how we can take the first steps towards a low-carbon lifestyle and examines how reductions to our personal emissions can help the UK meet the demanding 80% target.

'Emission impossible?' is also the first step towards the Energy Saving Trust's strategy. The ambitious goals set out here will shape our activity for the next few years, as we begin to focus on making this vision for a low-carbon lifestyle an achievable reality.

Getting it started

We don't yet know how we'll meet all of these goals. Nor do we yet have a full picture of the impacts of all of the measures. (The facts and figures given in this report are based on our best knowledge now, but cannot simply be added together nor can we assume all of them will be achieved in full). However, we do know enough about what does make a real difference in order to make a meaningful start towards getting personal carbon emissions down by 80% by 2050.

From now to 2020

How do we start reducing our personal emissions? Let's first put things in context. The debate about whether CO₂ emissions are a problem is over and there is a consensus over anthropogenic climate-change. But – people are not yet taking enough action.

Why not?

It's a complex answer, which has much to do with the fact that people often cannot see how they can make a difference in the face of such a huge issue.

To help, we need to give clear messages about what people need to do and why. We also need to put in place policies which make it easier to act – and harder not to. It's not just about money – we aren't always economically rational beings and we don't always follow price signals.

But one thing that all people react to is the concept of value. So the starting point for a low-carbon future is for our emissions to be more visible and more obvious in terms of volume and cost. Because once people begin to associate energy-saving behaviour with real numbers, their attitudes will change.

To get to this point, we need to quantify the problem as accurately as possible, with carbon budgets for the country as a whole and a pathway for reductions. Government is making a start on this now, but the idea needs to be made to stick, with real commitments to act.

We have the consensus as far as recognising the problem is concerned – now we need consensus on action, too. Politically, there needs to be a cross-party initiative in order that actions are not limited by the short horizons of a term in office.

Nearly 60% of people are pessimistic that Britain will meet its carbon reduction targets.

The first steps

The first few years towards a low-carbon future can start now, using a combination of existing and new policy and technology to move toward the target.

The steps that follow are the Energy Saving Trust's view of what these should and could be to 2020, based on the elements that make up our personal carbon footprint:

- the way our homes are built
- the source of energy we use
- the product choices we make
- how we travel
- our day-to-day behaviour
- our use of water
- how we use resources and deal with waste.

Being seen to be green is popular among 70% of the UK population, but only 40% of people are actually taking action.





Energy-saving homes

Improve energy performance · 27 MtCO₂/yr

Averaged across all homes, carbon savings of some 20% can be made by installing readily available technologies like loft and cavity wall insulation and gas condensing boilers. Achieved through a mix of incentives (such as CERT and tax breaks), independent consumer advice and regulation, this could yield a saving of about 18 MtCO₂.

But there is also still a need for other measures which are not yet easily or cheaply available, such as floor insulation or improved glazing. Further measures such as installing double glazing, high-performance hot water cylinders and LED lighting could save around 9 MtCO₂.

Make it easier to insulate old houses · 11 MtCO₂/yr

Nearly a quarter of the UK's 26 million houses are old and have solid walls that cannot easily and cheaply be insulated. Heating is the biggest contributor to household carbon footprint and more heat (up to 50%) is lost through the walls than through any other part of the house. So finding effective solutions for insulating solid-wall homes should be the first new step to reducing emissions from these households. A combination of promotion to bring costs down, grant incentives and investment in new types of insulation product could kick off this process. If all solid-wall homes were insulated, 11 MtCO₂ would be saved.

Tackle the private rented sector · 3 MtCO₂/yr

There is no effective incentive for landlords to make their properties energy efficient. Yet the private rented sector accounts for 10% of Britain's housing stock. All landlords could be required to take action on Energy Performance Certificate (EPC) recommendations when letting a property. The potential reductions are almost 3 MtCO₂.

73% of people think it's important to improve Britain's housing stock and know what it takes to meet carbon reduction targets.

Make new houses and new developments zero-carbon · 26 MtCO₂/yr

In England, the government has committed to ensuring all new homes are 'zero carbon' by 2016, and Wales has set itself an even more challenging target. The technology exists now to achieve these goals. If zero-carbon standards were adopted across the UK they would avoid emissions of 26 MtCO₂ compared with continuing to build to 2006 standards. This is why it is imperative that we make sure that builders and suppliers know what is needed and how it may be achieved as they plan construction – and that we help people who live in these future homes to make the best of them.

And it's not just what happens within our houses. New residential developments and communities should be built with zero-carbon in mind, with low-carbon transport and renewable energy supplies planned in from the start.

Make good energy performance a prerequisite for sale · 19 MtCO₂/yr

This will ensure a quicker rollout of 'retrofitting' measures through the housing stock. EPCs now provide us with the information we need – we should make active use of these by upgrading houses before they change hands. Reducing council tax in return for improving a house's energy performance would provide further incentive for energy-saving measures. This sort of policy could bring about savings of around 19 MtCO₂.



Energy choices

More microgeneration · 10 MtCO₂/yr

A careful blend of incentives to make products affordable and give consumers more choice and confidence will boost uptake of domestic microgeneration technologies above their current low levels. For example trials will demonstrate how products perform in domestic use. And longer-term certainty (e.g. through government targets for microgeneration) will stimulate investment and help bring nascent technologies like fuel-cell combined heat and power (CHP) to market at a reasonable price.

A combination of actions are needed. For example, consumers need attractive energy-based reward schemes – like feed-in tariffs for selling energy back to the grid. Another option is to offer people an upfront payment for the projected energy generated by the microgeneration system over a period of say, five or ten years.

There's potential too for communities to get involved with, for example, local renewable or CHP schemes.

With the right policies in place, up to 10 million microgeneration units – solar thermal, PV, heat pumps, wind, micro CHP and some biomass – can be installed by 2020, saving up to 10 MtCO₂.

Make heating smarter, more efficient and easy to use · 9 MtCO₂/yr

Building regulations already require more efficient boilers. If an upgrade plus smarter heating controls were mandatory at sale or refurbishment of homes, the majority of old boilers could be replaced by 2020. This would contribute a saving of up to 9 MtCO₂.

Roll out smart meters and smart controls · 7.4 MtCO₂/yr

All the technology is available now to enable people to see how their energy is being used, what it's costing them and how to 'tune' it. Such awareness helps people shift attitudes towards energy-saving behaviour.

Trials elsewhere show that smart meters encourage people to save at least 5% of their energy use: in the UK that would mean around 7.4 MtCO₂.



Product choices

Make energy efficiency attractive · 4 MtCO₂/yr

If energy efficient products are desirable (both personally and socially), long-lasting and durable, they will become the natural choice. If by 2020 everybody chooses 'wet and cold appliances' (e.g. fridges and washing machines) that conform to the current Energy Saving Recommended standard, this would save around 4 MtCO₂.

Change a lightbulb · 2.5 MtCO₂/yr

If by 2020 all lighting using incandescent lamps was replaced with CFLs, and all halogens were replaced by energy-efficient versions, we would save 2 MtCO₂. As LED technology improves, we might expect further savings of around 0.5 MtCO₂ if half the CFLs and all halogens were replaced by LEDs.

Stop inefficient appliances coming to market · 2 MtCO₂/yr

More 'choice editing' of inefficient appliances – which could include voluntary agreements, price signals or outright bans – would get round the problems of energy ratings by simply ensuring that all household appliances are maximally efficient. It can include setting maximum power levels too. So there's no need for people to agonise over buying decisions or the interpretation of complex labelling.

Technology such as 'intelligent mains panels' already exists to remove the worry about appliances left on standby – plus it's also possible to minimise the amount of energy that standby uses. Combining these measures should halve the amount of energy we waste this way, saving up to 2 MtCO₂.

By 2020
69% of people
say they will have
replaced their current
fridge with an
Energy Saving
Recommended
model.



Travel

Promote 'travel hierarchy'

Between now and 2020, everyone should become familiar with the concept of 'travel hierarchy'. The cost of different modes of travel and the design of transport infrastructure will reflect this. We will ask: do I need to travel? Can I walk or cycle? Can I take public transport? We will only drive or fly when it is really necessary.

Personal travel planning with real-time transport information and route planning can help people choose the lowest-carbon way to travel. Pilot schemes have shown that it reduces car usage by 11%.

Give drivers a reason to drive low-emission cars · 20 MtCO₂/yr

If by 2020 people chose the lowest-carbon car in its class (as available now) they could save up to 25% of emissions from individual car use, removing up to 20 MtCO₂.

Give industry no choice but to produce high quality low/no-emission vehicles

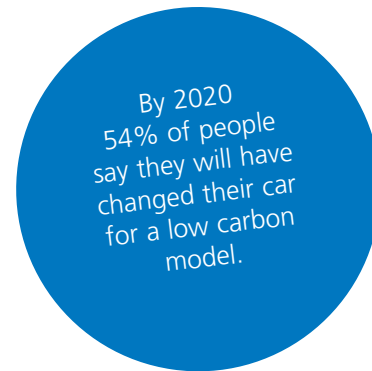
The recent rash of sub-120g/km CO₂ conventional cars shows that the industry can act fast if it wants to. Recent research has shown that if the proposed limit of 130g/km by 2012 was instead reduced to 120g/km and then to 80g/km by 2020, the CO₂ saving would be increased by two and a half times.

But lead times are long in the motor industry and manufacturers need strong signals from government if they are to be confident there will be a market for more energy-efficient vehicles. Manufacturers have an opportunity to restructure the market so that the least polluting models are the most desirable and aspirational choices.

Make efficient driving the norm · 9 MtCO₂/yr

Eco-driving can make a real difference: driving for fuel efficiency can cut emissions by 15%. Dashboard technology could also boost eco-awareness, reminding people whether they are driving at the most efficient speed or if tyres need to be pumped up. Enforced speed limits can further reduce emissions.

Coupled with a shift to lower-carbon cars, eco-driving could save another 9 MtCO₂.



Behaviour

Change people's minds · 6 MtCO₂/yr

Even without any policy, technology or pricing interventions, simple 'no cost' habits will make a real difference. Actions such as turning down heating, boiling only as much water as is needed, switching off lights and washing at 30°C could together save around 6 MtCO₂.

But people still aren't doing this. More than anything else, the arrival of a carbon value for everyday choices will make a 'low-carb' diet seem like an attractive, pragmatic option rather a drop in living standards.

Make sustainable energy aspirational

Just as with other technological transformations, people must want sustainable energy technologies if these are to take off and be developed successfully. And for these technologies to be effective at saving carbon, they must be used in an efficient way. This too will need changes in both behaviour and attitude by manufacturers and retailers, so that the most energy efficient products are effective, attractive and well priced.



Water and waste

Make water valuable and visible · 1.75 MtCO₂/yr

Ascribing value to water and waste is the first step in reducing their carbon footprint. A rollout of water metering will encourage basic water-conservation measures, with estimated savings of 10% per year. We all use 150 litres per day, which has its own carbon cost of 0.7g/litre plus the carbon cost of hot water for washing, cooking and cleaning, which stands at 35 MtCO₂. So even a 5% saving on hot water will save 1.75 MtCO₂.

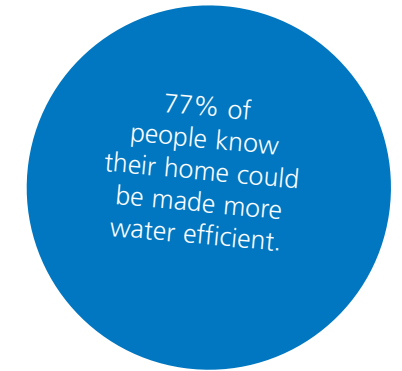
Build water-efficient homes and products

Just as new homes can be more energy efficient, they can also be built to use less water. New regulations this year will bring water use down to 125 litres per person per day, driving more savings by 2020. We can also provide better products for water recycling and waste/rainwater harvesting. This means, for example, making it easier for people to use waste/rainwater to flush toilets and water gardens rather than using 'high-carbon' drinking water.

Efficiency standards similar to those for power-using appliances can be applied to products that use water and hot water – through setting standards for manufacturers and working with retailers to help buyers choose the most efficient products.

Recycling and composting · 10–15 MtCO₂/yr

Consumer incentives for composting and recycling will reduce the quantity of refuse going to landfill or incineration, whilst producer and retailer incentives plus legislation will reduce the amount of potential waste entering people's homes. Our current – limited – recycling habits save between 10 and 15 MtCO₂ a year.



Improve information, advice and access

Just as for energy saving, a blend of policies will bring results here. Providing accurate, locally tailored advice and helping people realise how waste management is linked to their carbon footprint helps them make the right choices. Improving access, for example, to specialist recycling facilities removes barriers to action.

Ditch the disposables

In a low-carbon world, disposable options are the last resort. Reusing products saves carbon by avoiding the waste of their 'embodied' carbon and the carbon cost of landfill. For example, donating clothes to charity shops would save the average household almost as much CO₂ as turning down the thermostat by one degree centigrade.

Waste not, want not · 18 MtCO₂/yr

We need to be aware of the contribution that wasting food makes to climate change. That way we are more likely to choose to minimise waste and equip ourselves with the knowledge to compost the rest at home. We throw away 6.7 Mt of food a year. This is equivalent to a carbon footprint of 18 MtCO₂ if we take into account the energy used in producing, storing and transporting food as well as its contribution to landfill gases when we dispose of it.

2020 and beyond

If we have succeeded with all of the aims outlined in the previous section, the low-carbon future will be taking shape. Let's look ahead to how life in 2020 could be:

Thanks to the national carbon budgets and cross-government support, everyone is as focused on personal carbon as they are on personal finance and a healthy diet, so low-carbon behaviour is the norm. To do otherwise has become socially (and financially) unacceptable.

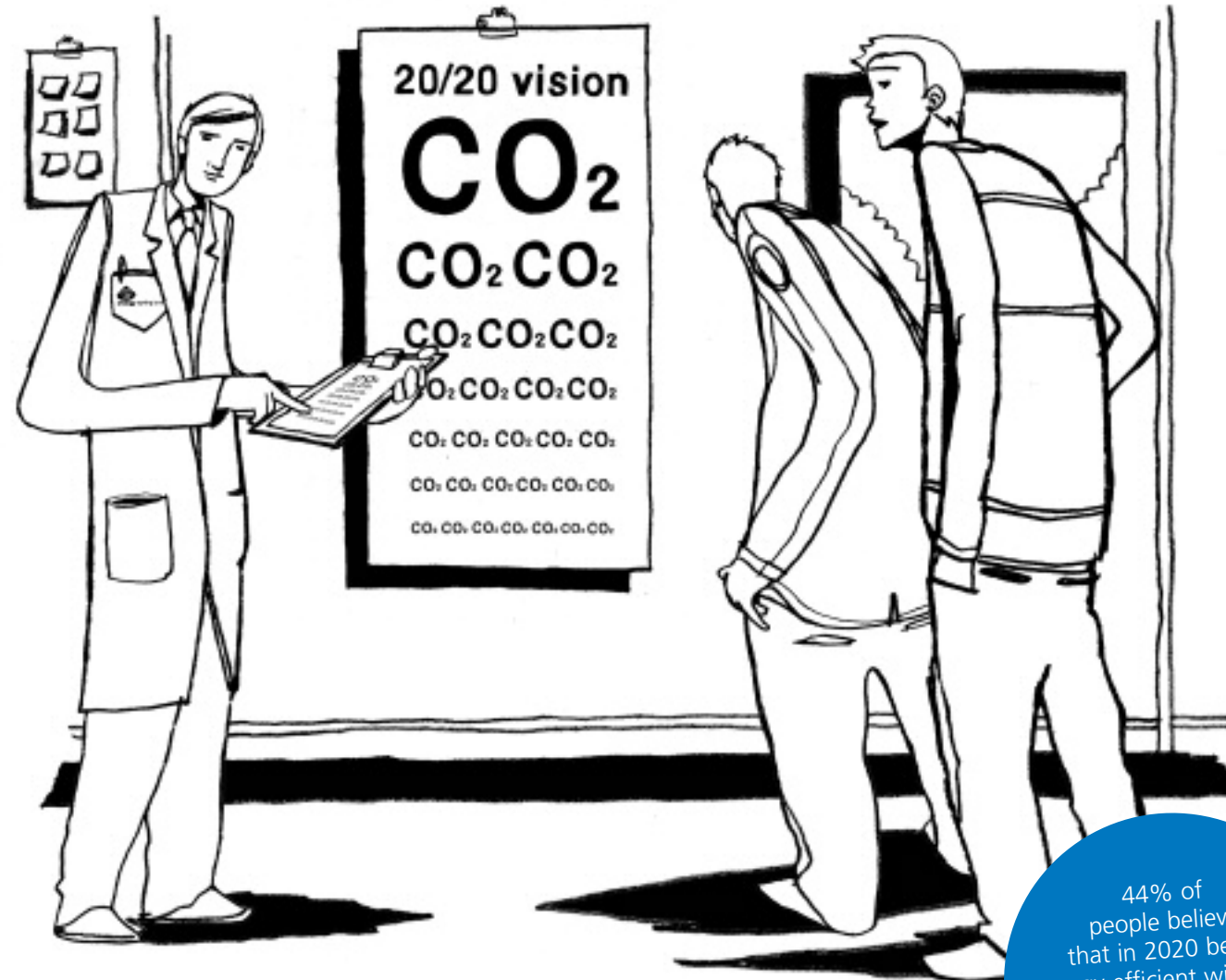
All new homes are zero carbon and all 'existing' homes have been brought up to the highest energy efficiency standards. Many more millions of microgeneration units – solar thermal, PV, heat pumps, wind, micro CHP and some biomass – have been installed. Houses are therefore more comfortable and more affordable to heat.

All products will be at least 'A' rated for energy and the worst-performing will no longer be available. Patio heaters will be a thing of the past.

Communities are designed so that walking and cycling are the preferred modes of transport. Cars are smaller, lighter and more energy efficient and the thinking on personal transport has changed, helped by better information and more integrated public transport systems.

We understand the carbon cost of water as well its financial cost and treat it as a precious resource. We use water more efficiently, harvesting rainwater and recycling greywater so it can be used for showering, washing, or sanitary purposes.

We buy products with the least packaging and choose appliances which are built to last. Most household waste is now recycled or composted.



The next steps

As we can see, there are some big numbers here – even by 2020. But they don't, of course, simply add up to a total saving. Nor can we assume everybody has taken all possible actions. So by 2020, there'll still be some way to go to get to our 2050 target and reduce personal emissions by 80%.

Other parts of the UK's carbon reduction programme, such as grid decarbonisation – producing energy from low-carbon sources, such as wind power – will of course contribute. But there is still scope for further significant reductions resulting from personal behaviour.

So here are some of the steps that could be making further inroads into our target beyond 2020. Whilst some are well into the future, we need to start planning for them now.



Home

Automation of energy-using technologies

Controls for home heating and for energy-using appliances and electronic equipment could become highly sophisticated and controllable remotely to minimise energy use.

Zero carbon for all homes · 150 MtCO₂/yr

To achieve this, we will need investment in more domestic-scale energy efficiency technology that is not currently cost effective: floor insulation, improved glazing, insulated doors.

This, coupled with zero-carbon fuels, microgeneration and community heat schemes, will mean that all homes could be refurbished to the standard of new, zero-carbon homes. Thermal efficiency could be such that heating is only necessary for a few cold days in winter and designs which better capture natural light would mean we don't need the lights on as much.

Almost 150 MtCO₂ could be saved if all dwellings in the UK were zero-carbon.



Energy choices

More demand for renewable energy

The electricity grid should by 2050 have been steadily decarbonised with the introduction of more renewable power sources – driven by consumer demand for tariffs that allow us to specify low carbon-intensive sources.

More microgeneration · 30 MtCO₂/yr

Economies of scale will have reduced the cost of microgeneration so that it becomes the norm and 'designed' in to new-build houses. Many others will opt to add microgeneration to their home. Under favourable policy scenarios, microgeneration will contribute a 30 MtCO₂ reduction in CO₂ emissions by 2030.

Community energy schemes

For some, community energy schemes will make the most sense, because local biomass CHP is attractive in both financial and carbon terms. Community-level metering also shows communities how much energy they are using/saving and enables them to sell surplus energy to other consumers or to non-domestic users in places such as schools or leisure centres.



Product choices

More power, less carbon

Technologies such as low-power chips and OLED displays are needed to boost the energy performance of products further. We may have more gadgets which need power, but increased efficiency and lower-carbon energy mean we emit less carbon in total. For example, small portable appliances which are self-charged by kinetic energy will be zero-carbon in use. 'Waste' heat, e.g. from hot water going down the drain, will be captured and used to generate electricity to power small appliances.

Consumer power

Customer demand for low-carbon products should drive investment and innovation. Consumer power means businesses will need to compete for market share on carbon as well as price.

By 2050,
56% of people
want cars to be
very low carbon and
powered by fuel cells
or electricity.



Travel

Reducing the need for travel

Improved communications technology and sustainable planning will significantly reduce the need for travel. Cities and communities must be designed for pedestrian priority and safe cycle lanes with secure cycle storage facilities are seen in all communities.

Plugging in

Reduced energy consumption, community and household microgeneration, and a decarbonised grid will make 'green' energy for electric cars a more viable option. They could become the norm for journeys of under 50 miles.

More alternative fuels

By 2050 cars will no longer run on fossil fuels but be powered by potentially zero-carbon sources such as electric batteries and hydrogen fuel cells. Carbon-free fuel could have reduced emissions from cars by up to 90% depending on the availability of low-carbon electricity.

Fair charging

Advanced telematics relate road charging to emissions and distance would make ultra-low emission personal transport the most attractive option.

55% of
people believe
that a law making all
products have a carbon
label by 2050 is
needed.



Behaviour

Community-centred behaviour

Whether it is working closer to home, buying food that has been grown locally or operating one's lifestyle within a smaller radius, it makes 'carbon sense' to become more 'localised'.

Visible carbon and easier choices

People need to understand how much carbon their lifestyle uses and be able to make carbon-based choices in the way they travel, the products they buy, and the energy used to heat and light their homes. The social cost of carbon needs to be reflected in the price of goods and services.

Thanks to clear labelling of the carbon used to make the products we choose, we will be able to understand the impact of the choices we make as consumers.

Personal carbon management

With sensible choices and the right policies and technologies, we will not need to ration carbon or provide people with mandatory allowances. But we need to help people manage a carbon budget and give carbon a clearer value. That way, people will be able to make balanced carbon choices the way they now choose the components of a balanced diet. So we might save in our house, and spend on travel, if that suits our lifestyle.



Water and waste

Home-based technology

With people now aware of the cost of both water and waste, the groundwork needs to be laid for further savings and better use of low-carbon water. Houses will be routinely fitted with rain-harvesting devices for toilet flushing, clothes washing and garden use – and will recycle greywater too.

Sustainable drainage systems will also ensure that rainwater falling onto driveways and paths is recycled rather than lost to the sewage system.

No more bottled water

Homes should have two water supplies: high quality, filtered water for drinking and lower quality, lower-carbon water supplies for washing clothes and flushing toilets.

Improve and upgrade

Products need to be built to be more resilient in use and more easily repairable so they need to be replaced less often. But this need not mean we have to live without the latest technology. Instead, products would be manufactured so that we can add new functionality to our existing products such as phones, TVs and washing machines by changing a component rather than the whole device.

In a low-carbon world, things are made to last. Clothing, for example, would no longer be the throw-away commodity it has become and we'll be prepared to pay more for better quality, longer-lasting textiles.

The 2050 low-carbon lifestyle



Home

All homes are 'zero carbon', no matter when they were built through a combination of insulation and microgeneration.

62% of people would like a home where it is only necessary to heat it for a few days a year due to the high standard of insulation used.



64% of people would like all waste heat (i.e. from lighting, water etc) recovered from the home and used to heat hot water by 2050.



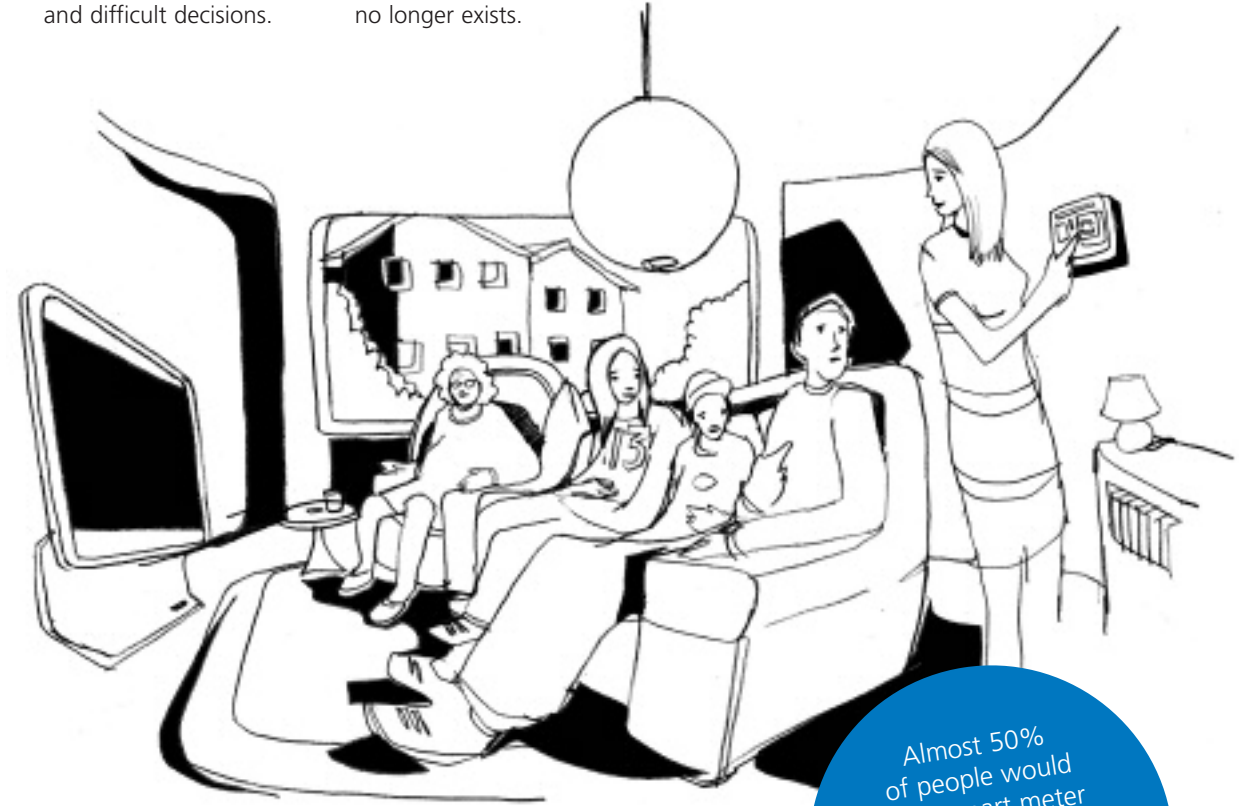
Energy choices

Carbon cost now determines your energy choices. And smart controls optimise energy use. No need for complex and difficult decisions.



Product choices

Wasteful appliances are no longer available: all power-using products are designed for maximum energy efficiency. Standby no longer exists.



Almost 50% of people would like a smart meter in their home – and around 95% of those would use it to save energy.



Travel

We need to travel less – and when we do it's on low/no-carbon options with lower carbon fuel.



Behaviour

A low-carbon lifestyle is aspirational. It has become socially unacceptable to waste energy. We understand our personal carbon footprints and know how to live within our means.

47% of people would like a public transport service that was efficient, convenient, integrated, low cost and where low CO2 emissions were paramount.



40% of people hope that by 2050 wasting energy will be considered the most socially unacceptable of behaviours.



Waste

Products that we buy will last and can be repaired rather than binned. Packaging will be at a minimum. Bins will empty, because waste will be recycled or composted.

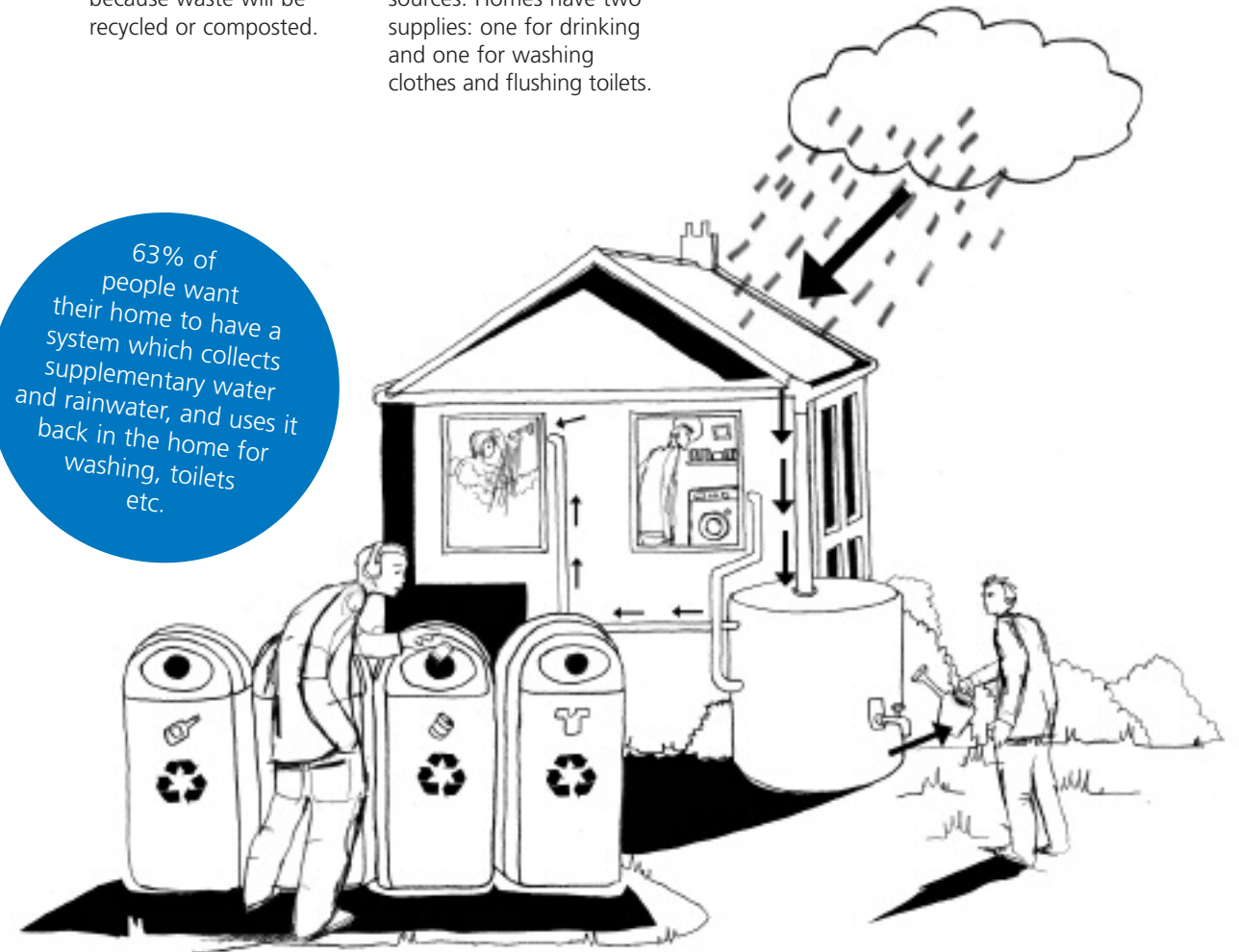


Water

Water efficiency is the norm. Houses have rain-harvesting measures that save water being treated and pumped from distant sources. Homes have two supplies: one for drinking and one for washing clothes and flushing toilets.

41% of people would like the option to buy locally grown food to help cut down on packaging and food miles.

63% of people want their home to have a system which collects supplementary water and rainwater, and uses it back in the home for washing, toilets etc.



What the Energy Saving Trust does

Our mission is to lead 60 million people to act on climate change

We help people take action to reduce carbon in their homes and lifestyles by:

- Promoting the need for action
- Providing information and advice on what they should do
- Offering practical support to help them do so through our advice centres and website, through the media and through communities.

We also:

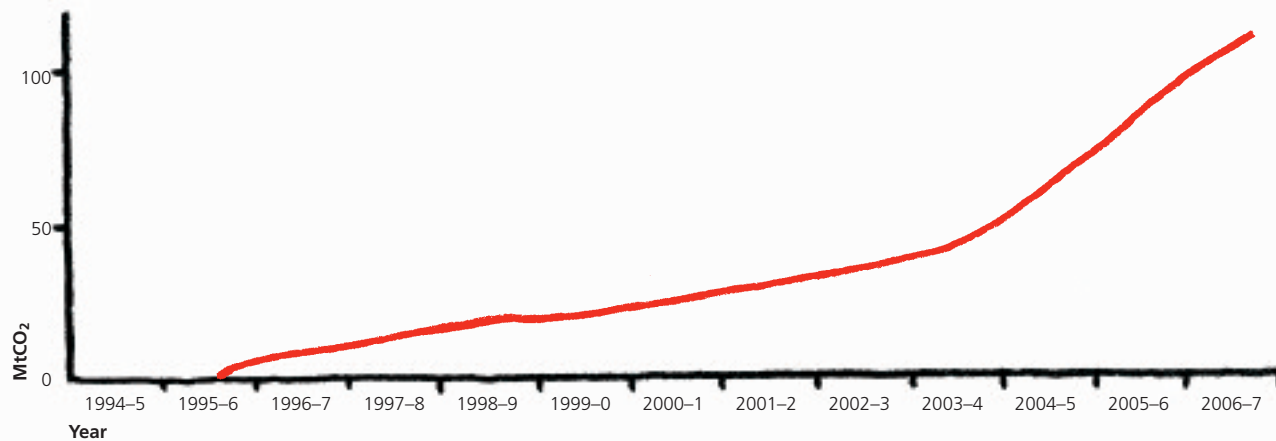
- Support manufacturers and retailers to deliver low-carbon technology and energy efficient products
- Help builders and suppliers to build low-carbon homes and improve existing housing
- Advise governments on policies needed to create a low-carbon society.

What we have achieved

The Energy Saving Trust has been helping people reduce their carbon emissions for 15 years by making the most of their energy. Through our initiatives, we have funded or influenced the installation of sustainable energy measures – such as cavity wall and loft insulation – and helped people choose lower carbon transport and renewable energy.

Over their lifetime, these measures will lead to savings of over 100 million tonnes of CO₂. In 2006/07 we engaged directly with over one million consumers. But we know we need to do more.

Energy Saving Trust influenced lifetime CO₂ savings 1994 – 2007



Where we want to go next

Our vision for the future is that every home is a low-carbon home and everybody leads a low-carbon lifestyle by:

- Taking energy-saving behaviours
- Buying the most energy-efficient products
- Fitting their homes with energy-saving measures
- Making sustainable travel choices
- Choosing renewable energy, including microgeneration
- Conserving water
- Reducing and recycling waste

This vision set out in 'Emission impossible?' is the first step towards our future strategy. We don't yet know how we will achieve everything we think will be necessary for a low carbon lifestyle, but we do know that we need to act now.

As we begin to plan our future activity we want to know if others share our vision and to hear what people think we should do to meet the challenges ahead.



Want to make a low-carbon lifestyle a reality?

If, like us, you want to make a start now to living a low-carbon lifestyle, call our advice line (0800 512 012) or visit www.energysavingtrust.org.uk for information about what you can do.



Energy Saving Trust, 21 Dartmouth Street, London SW1H 9BP, Tel 020 7222 0101, www.energysavingtrust.org.uk

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