



The Carbon Countdown Road to 2030

e.on



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"The next decade will be critical if we are to meet that 2050 target..."

Foreword

The clock is ticking: accelerating the move towards a net zero future



Michael Lewis
Chief Executive,
E.ON UK

The UK has already begun its net zero journey: increasing energy efficiency and the rise of renewables across our electricity grid mean that since 1990 our greenhouse gas emissions have almost halved – a world-leading performance.

We're still only at the beginning, though, and if we are to stay on track to meet our 2030 contribution to the Paris Agreement, we will have to cut emissions by a further 40%.

The UK has a bold target of achieving zero net carbon emissions by 2050. By drastically reducing carbon emissions, building out green energy infrastructure, adopting cleaner technologies at home and at work, changing motoring habits and other measures, the aim is that any emissions we still produce will be balanced by the growing number of opportunities to offset an equivalent amount of greenhouse gases from the atmosphere. Ahead of COP26 in Glasgow last year, the first time the UN climate change conference has taken place on these shores, the Government announced a raft of new measures to help with those transitions; including £620m in grants for electric vehicles and street charging, as well as funding of up to £5,000 for any household installing a low-emission heat pump.

40%

If we are to stay on track to meet our 2030 contribution, we will have to cut emissions by a further 40%.

Those developments only increase the responsibility of policymakers and business leaders to take the lead in reducing the UK's carbon footprint. Indeed, E.ON's own research with 20,000 people across the country shows that three fifths of the public think environmental change starts with decisions made by government officials and businesses.

Still one of the biggest areas that needs tackling is the UK's over-reliance on gas. Events of the last 12 months have starkly revealed how vulnerable we are to the peaks and troughs of global prices, while Russia's role in international gas supply is, of course, under increased scrutiny given its power as political leverage over Western nations.

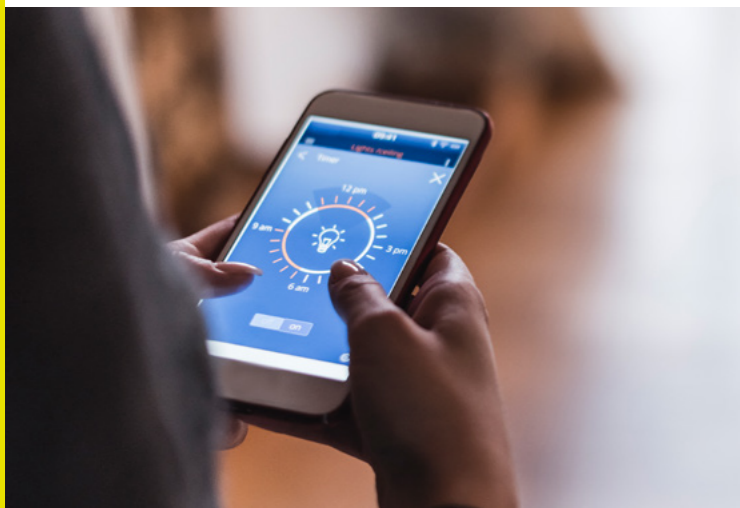
We need to recognise that gas central heating – now one of the UK's largest sources of emissions – must be replaced with cleaner alternatives: electric heat pumps for the majority of domestic heating needs, developing low carbon heat networks and utilising waste heat as a resource, while exploring a role for hydrogen for industrial purposes and storing renewable power. Alongside that, we have to take petroleum out of transport and solve the problem of storing energy at scale so it can be made available when most needed.

This report – now in its second iteration to reflect the changing landscape, challenges and opportunities in this sector – investigates the changes needed in our homes, our businesses and our city infrastructures to get to net zero by 2050. We examine how far and how fast that acceleration needs to go in order to get there, what we can all do to speed things up, and policies to ensure the country is able to achieve those ambitions.

A big part of making those policies work is transforming the energy sector at the customer level, making the green choice the simplest, most aspirational and most cost-effective option for millions of people. Smart meters are now the default options in our homes, helping consumers to manage and reduce their energy consumption. And the Government's decision to end sales of new petrol and diesel vehicles by 2030 has spurred the market for – and choice of – electric cars, further reducing our dependence on fossil fuels.

However, engaging people in sustainability issues has been made much harder by the cost-of-living crisis. Quite understandably, when prices of everything from energy to fuel and food are surging, consumers' main concerns are about managing their finances and looking after their families as best as they possibly can.

The Energy Security Strategy, released by the Government in April, should have set out ways to protect customers' wallets and the UK's progress towards net zero, but it delivered neither. Instead, by abandoning any extra commitment to help people improve their homes, it condemned many thousands to living in cold and draughty homes, wasting energy and paying more than they need to for their heating.



While there is no COP26 this year to serve as a public focal point for climate action, there are notable events that will shine a spotlight on our communities and regions, and the role that net zero has to play within them.

For example, the Commonwealth Games in Birmingham – a world class sporting spectacle of which E.ON is proud to be a partner – aims to create its own carbon neutral legacy in a part of the country that's also our home. This is a powerful objective and one we are delighted to play a key role in, across an area where we are a major employer and contributor to the local economy.

We're not blind to the role that energy companies must play in ensuring greener energy is delivered in the most efficient, lowest cost and most customer-focused way. At E.ON, this means continuing our own journey towards providing personalised, smart and sustainable solutions for each and every customer. Our #ActionForClimate campaign celebrates the role of every day change-makers and their personal actions to help reduce the UK's carbon footprint.

Getting to net zero in 2050 will be a sizeable challenge, especially against the backdrop of a cost-of-living crisis. But the decisions we take, the investments we make, and the path we follow in the next 10 years will decide whether we are on the right road to meet the goal.

Net zero by 2050 is achievable. We all bear responsibility for our actions in ensuring we meet our climate goals.



The 2020s: make or break

“Is this how our story is due to end – a tale of the smartest species doomed by that all-too-human characteristic of failing to see the bigger picture in pursuit of short-term goals?”

Sir David Attenborough
COP26

The next few years are vital to get the UK on track to meet some of the most ambitious climate change targets in the world – bringing our greenhouse gas emissions to net zero by 2050¹. That target, adopted in legislation in the summer of 2019, means achieving an overall balance between the emissions we produce as a country and the emissions which can be taken out of the atmosphere. For example, by planting trees or deploying carbon capture technology – if it can be made workable.

Since the new targets came into force, Covid-19, a cost-of-living crisis and the threat of recession have impacted the domestic and global economies and put huge pressure on governments, businesses and consumers. The path to recovery now seems longer and more turbulent than many imagined it would be, even a year ago. What was already a challenging environmental task has become even tougher with new financial constraints.

However, if Covid-19 has provided any positives it is the sense that given the right ambition, huge advances are possible. The climate crisis is magnitudes larger and more destructive than the pandemic, but the global response to the virus demonstrated how emissions can be tackled at scale and in real-time if given the right urgency.

Commentators at COP26 called for that short-term progress to translate into a longer-term plan, with all nations working together. Promisingly, the conference ended with almost 200 countries signing up to the Glasgow Climate Pact, with commitments to end and reverse deforestation in all corners of the globe and to cut methane emissions by 30% in the next eight years. However, Manuel Pulgar-Vidal, the WWF's Global Lead on Climate, also sounded a more cautionary tone:



“We must acknowledge that progress was made. There are now new opportunities for countries to deliver on what they know must be done to avoid a climate catastrophe. But unless they sharply pivot to implementation and show substantial results, they will continue to have their credibility challenged.”

Manuel Pulgar-Vidal
WWF's Global Lead on Climate



“We cannot be radical enough in dealing with the issues that face us at the moment. The question is what is practically possible. How can we take the electorate with us in dealing with these things?”

Sir David Attenborough
(speaking to the Business, Energy and Industrial Strategy Committee, 9 July 2019)

Off the back of COP26, there is increasing agreement that progress this decade is fundamental to the 2050 goal of carbon neutrality. That perspective is not new – a report by the UK Climate Change Committee in December 2020 said the 2020s “must be a decade of progress and action on climate change”². What is emerging, however, is more detailed understanding of how large the financial commitments and shifts in behaviour need to be to make change happen.



In the UK alone, the necessary improvements required this decade will cost an **estimated £50bn**

While much of this could be recouped in the longer term through efficiency gains – savings on energy bills at home, cheaper transport costs, returns on business investments – there will still be upfront costs to bear.

For business, it is likely to mean investing in new technology and new processes, just as they are recovering from the pandemic. Our cities will need new infrastructure to meet the changing needs of their people and industries in a post-Covid world.

They also need to reduce dependence on carbon-intensive energy sources, both by making better use of renewables through battery storage and flexibility, as well as building ever more sustainable generation sources around the country.

All of this requires long-term thinking. For that reason – even though they may not be the people with decision-making power or the funds required to effect change – young people have a voice that needs to be heard on how we tackle action for climate in the UK.

Green means go: a powerful message of change and hope

As part of our sponsorship of the Birmingham 2022 Commonwealth Games, E.ON enlisted the support of Casey Bailey and Fatma Mohiuddin, Birmingham's Poet Laureate and Youth Laureate.

Between them, Casey and Fatma created **Green Means Go**, a new composition which sends out a powerful message, both of challenge and hope to policymakers and business leaders across the country on why change is needed, and why it needs to arrive quickly.



Green means go

Sometimes we call young people green, like tomatoes, or strawberries before they ripen. For too long we treated the earth like strawberry and tomato fields, picking what we wanted, taking for the now, quick to feed our hungry mouths.

It's scary how quick we can turn from green to jaded. We know acorns grow to oaks but I wonder – what do mistakes turn into. How many times can we say that it's time, then instead of taking action take our time.

Time is ticking, so it's no surprise that most don't think change is happening fast enough.

Green means go, there are people hoping flagship events like major games can be a catalyst for change as we race towards Net-Zero people who want to be listened to, who want local governments to work with corporations to make change happen.

Green means go, we have push on this journey from Chief Carbon Consumers to the revolutionaries of renewables. We need action for climate.

The winds of change are blowing and the people want wind turbines, they want homes that are greener and cheaper to run, communities and businesses that make their agenda clear.

Green means go.

You call young people green.

Maybe that's because you believe, in the seeds of youth that draw light, from a darkness tinted with the sparks of your hopes.

Watered with tears when you wonder, if these seeds will ever grow.

And the doubt that embeds it's fragile thorns, into the ground of your mind.

When you were too scared to believe, but you're still too scared to let go of your hope.

Because isn't hope the seed of every tree?

The spark in every flame?

The trigger in a call for change?

Because that change is the tree, and us, the fruits that make it worth fighting for.

People have described themselves as hopeful.

We understand the possibilities but we live in the reality.



US THE
FRUITS THAT
**MAKE IT
WORTH
FIGHTING
FOR**

Fatma Mohiuddin,
Birmingham Young Poet Laureate

4 in 5 believe that if we work together we can change the world for the better.

Sometimes we call young people green, and we know that nobody stays green forever, but that doesn't mean that the world can't stay green, but there is work to be done.

Green means go.

Now let's get going.

**THERE
IS WORK
TO BE
DONE
GREEN
MEANS
GO**

Casey Bailey,
Birmingham Poet Laureate





“When I was asked to be involved in this project I was genuinely excited, by the opportunity to speak on something so important and in a creative way.

As a poet, I believe that words always have the ability to be a catalyst to important change, so putting my voice to the discussion around climate was important to me.

I have a son who is 5 years old, who through books, videos and podcasts is already aware of the need to go green. **My hope for this campaign is that it can raise awareness and plant a seed in people's minds.**

As a Brummie, who has always lived in the West Midlands, I am proud to be a part of this region as it is, and to be a part of the future that is being built here. I see the increase in access for public transport, the expansion of dedicated cycle lanes, I see a place that is working towards change.

Casey Bailey

Birmingham Poet Laureate 2020-2022



“Living in Birmingham, I have seen people experience the diversity of new art and writing that the Commonwealth Games has triggered.

I got involved in this project to raise awareness about climate change and, more importantly, show people who don't think they can make a difference, that they can through having hope and taking action towards the world that they want to live in.

Poetry inspires people to connect to words they can relate to and they can motivate us to take action. I hope people connect to our poem and unite as a community to work towards the future they want.

I don't believe enough work has been done to make the world greener but that doesn't mean we can't make a change now. However, that change can only happen through the hope, efforts and ideas of us all coming together despite how much or little power we think we have.

We can't take back the past, but together we can build a better and greener future.”

Fatma Mohiuddin

Birmingham Youth Laureate



Households: why upgrading our homes and changing the way we live our lives is vital to meet the 2050 challenge



82% of people with a **smart meter** have taken steps to reduce energy waste

“More needs to be done to help consumers... which will ultimately support the Government in reaching their targets, while also helping the environment and potentially reducing household energy costs.”

Mortgage Advice Bureau

Accelerating the path towards 2050 means adapting our lives in two main ways: improving the energy efficiency of our homes and speeding up our switch towards cleaner forms of transport.

When it comes to electric vehicles, the UK already has hard deadlines which will force greater take-up. New cars and vans powered wholly by petrol or diesel will not be sold in the UK from 2030³. Decarbonising transport will cost about £12bn a year by 2035, estimates say, with drivers benefiting from reduced running costs totalling £20bn a year by the same date⁴. Electric vehicles are firmly on motorists' radars, making up one in eight of all new cars registered⁵. When it comes to our cars, there is a clear road map.

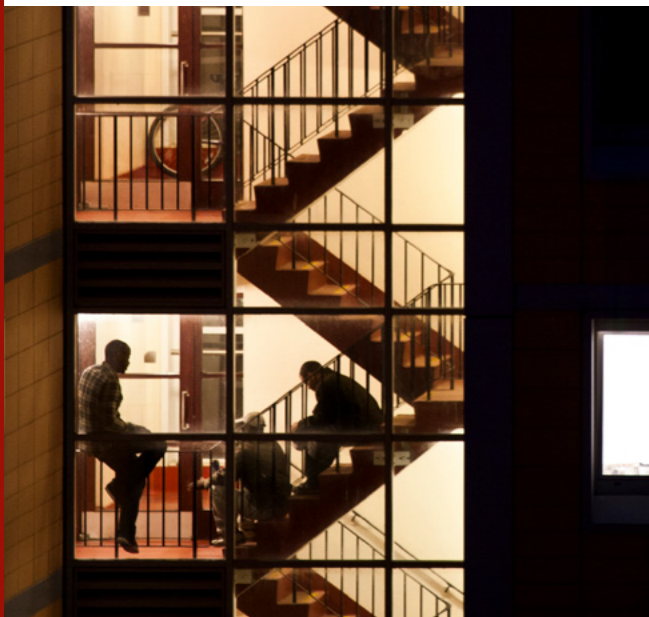


Housing presents more of a challenge. It's an unpopular but sadly necessary point to make: our homes as a whole are in a poor state, and collectively they are now one of the UK's largest contributors to the climate crisis. According to the House of Commons Environmental Audit Committee, homes account for around 19% of greenhouse gas emissions but are one of the few sectors where emissions reductions have stalled⁶. Last year, the committee wrote:

"The task is colossal: in England alone, over ten million owner occupied homes and over three million private rented sector landlords need to upgrade the energy efficiency of their homes to become A, B or C rated by 2035 for the Government to achieve its climate aspirations. We consider the Government has significantly underestimated how much decarbonising our homes will cost, and it needs to get a grip on this now, before it is too late."

House of Commons Environmental Audit Committee

The problem is the UK's existing homes – many dating from the Victorian or Edwardian eras – were never designed with sustainability and energy efficiency in mind. Many of our streets are lined with properties built at a time of (fossil fuelled) energy abundance, before energy security, the climate emergency and the health of our planet were viewed as concerns.



Concerningly, the Climate Change Committee's June 2022 report casts doubt on whether current policies are enough to get the UK to 2050 net zero targets. The greatest failure, according to the report, is the work on insulating our homes.

Campaigners have highlighted that the cost of living should not be an obstacle for improving energy efficiency, with the Climate Change Committee stating:

"Further support to help people with their energy bills should be aligned with Net Zero, in line with the Government's commitment to delivering a fair transition. The Committee would support moving the policy costs due to historical subsidies off electricity bills and onto general public spending, which would improve energy affordability and, by lowering electricity prices relative to those of fossil fuels, improve the incentive to switch heating from fossil fuels to electricity."

Achieving efficient homes is easier said than done, however. Cost and the potential disruption when refitting new heating systems are two of the bigger barriers and the CCC has previously estimated that to upgrade the energy efficiency of existing properties and install low carbon heating methods would cost around £250 billion to 2050. While almost two-thirds of homes need spend no more than £1,000 on retrofitting energy efficiency measures, older properties requiring the most work could require up to £28,000 of investment each to bring them into line with the intended efficiency standards⁷, a tough ask for consumers already facing increased prices on daily needs.

There are other barriers, such as an awareness gap among people who might not even know about heat pumps or other alternatives to a more traditional gas boiler. While there are many different grants available for those on lower incomes, there is a contradictory argument that there are too many options, meaning that applying for support can leave people confused: the latest and most politically prominent scheme in England, the Green Homes Grant, was scrapped after reaching just 10% of the 600,000 homes the Chancellor promised would be improved⁸. We need to make the process of ensuring that our homes are energy efficient simpler, more convenient, and something homeowners really value.

Unlike existing homes, ensuring new-build properties are 2050-compliant should, in theory, be easier. E.ON's own research with local council leaders certainly shows that there is a high level of ambition from the officials who commission or approve new-build housing projects, with 92% agreeing that all new homes should be constructed to a net zero standard.



However, while it is possible to build a new property that is highly energy-efficient – for example with a smart meter, triple glazing, insulation, solar panels, heat pump and EV charger – there is often insufficient incentive for housebuilders to construct in this way as such homes are likely to be more expensive to buy upfront, putting off potential purchasers.

Accelerating the process of improvement over the next decade will require efforts with existing homes and with new builds. When it comes to existing stock, that means taking steps including replacing boilers, installing better insulation and improved windows. New-build homes should be fully fit to meet the 2050 objectives. When a buyer signs up for a newly-built house, they should have the comfort of knowing energy costs and carbon emissions are as low as possible for the longer term, and neither will there be any extra costs to improve their home in the future. In addition, to support the acceleration of sustainability within the private rented sector, tighter standards will ensure better insulation and more efficient, safe, heating systems.

Other solutions to speed the change in our homes – whether existing or new build – could include greener mortgages (where providers offer larger loans to more sustainable households, reflecting higher prices upfront but lower running costs in the long term), improving the way energy bills are structured by ending rules which have the effect of subsidising gas at the expense of renewable energy, or ensuring consumers are connected simply and automatically with trusted suppliers to carry out the work required.

Although it's harder to achieve when finances are squeezed, the industry, Government and consumers must agree on a long-term view of how we improve housing across the UK. We must persuade people that the transition is not a chore, but a positive move that will not just reduce their costs and their environmental footprint, but also improve their lives and potentially their health. That it means warmer homes, cleaner air and a healthier way of living.

92% 
of officials who commission or approve new-build housing projects, agree that all new homes should be constructed to a net zero standard⁹



Let's make the energy transition aspirational

The climate emergency needs to come home – and consumers need to understand the scale of the challenge and their role in tackling it.

Until now, the focus has been on large-scale infrastructure projects such as offshore wind farms. The next stage will involve millions of people taking their own actions. The House of Commons Environmental Audit Committee says many homeowners are unaware that their involvement is needed, and will need financial support and advice to upgrade and retrofit their homes¹⁰. For countries like the UK, the CCC wrote:

“There is an urgent need to identify and implement solutions for promoting greater engagement and action from citizens and consumers... high-impact shifts in consumer behaviours and choices are needed that are consistent with the scale of the climate challenge, build optimism and commitment, and give weight to new ambitious narratives that inspire wide public participation¹¹.”

UK Climate Change Committee

Solving that challenge demands a 'hearts and minds' campaign from industry, Government and others to persuade people that the transition is not a chore, but a positive move that will not just reduce their costs and their environmental footprint, but also transform their lives. That it means warmer homes, cleaner air and a healthier way of living.



E.ON leading the way: home energy efficiency project

Scottish Highlands

Improving the energy efficiency of homes is only achievable in large numbers when the relevant methods are affordable and can be installed without disrupting people's everyday lives. As part of the Scottish Government's fuel poverty strategy, we have been involved in an eight-year project refurbishing about 3,000 homes in the Highlands.



Working with The Highland Council as part of the Home Energy Efficiency Programme for Scotland: Area Based Scheme (HEEPS:ABS) more than £40 million has been invested in revitalising ageing homes while cutting carbon emissions, lowering energy bills and reducing fuel poverty in the area.

The success of the project has come from installing a range of energy saving measures including external wall, loft and cavity wall insulation, air source heat pumps and solar panels – improving housing that was previously considered too difficult or too expensive to tackle in the past.

The long-term economic benefits for those taking part have been especially positive, with people seeing annual energy savings of between £150 and £460 per year. From an environmental perspective, it is estimated the improvements will generate lifetime carbon emissions savings of more than 44 million tonnes. In addition to local job creation, through a commitment to working with local trades and installers, property valuations taken after the energy efficiency improvements show that house prices have risen by around 15%.

Crucially, the HEEPS:ABS project could not have succeeded without dedicated and varied community engagement. E.ON's teams undertook school visits and community events to communicate energy saving tips in the home as well as the wider benefits of the scheme's roll-out. Customer satisfaction surveys showed a positive reaction to the work, with 96% of those surveyed saying they were either satisfied or very satisfied with the final results.

What householders can do today

Supporting the acceleration of the move to 2050 can seem like so vast a challenge that householders may feel daunted at the prospect of getting started and simply rely on the Government to lead the way.

Yet there are simple steps they can make that will have an immediate impact. They include the options in this image; from creating a warmer, more comfortable home, to opting for 100% renewable electricity, generating your own power from the sun, or switching to a more sustainable form of transport.

What E.ON is doing

E.ON customers get 100% renewable electricity at no extra cost. We can also install solar panels, batteries, heat pumps and electric vehicle charging facilities, helping customers improve their own energy efficiency and start to create their smart, personalised and sustainable future. We are one of the driving forces behind the Government's push to make homes more energy efficient: our colleagues are out and about in our communities helping make homes more sustainable.

More information from E.ON on the steps homeowners can take is available at eonenergy.com/save



Switching their home to green energy



Making their next car an EV, and install charging equipment where possible



Ensuring their homes are fitted to the highest possible standards of insulation, including cavity walls, interior or exterior solid walls, and lofts



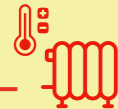
Installing LED lights throughout the house



Consider generating zero emissions electricity through solar panels for example



Install a smart meter to help you make better decisions on where and how you use energy, helping you make your home more sustainable



Installing smart radiator thermostatic valves to better control temperatures throughout the home



Using a smartphone energy control app to manage heating and appliances



Fitting double glazing where possible



Switching to more environmentally-friendly heating systems such as heat pumps, or installing the most efficient boiler possible



Businesses rise to the challenge of net zero 2050

"Improving the energy performance of your buildings and operations should now be of paramount importance. We've seen how volatile the energy market can be, and even though prices will come back down, future events and the impacts of climate change will cause prices to spike again."

Carbon Intelligence



50%
of UK businesses
**'targeting carbon
neutrality by 2030'**^{r12}

Getting the UK on track to meet its 2050 goals will require substantial short-term investment. Yet businesses – and SMEs in particular – will still be dealing with the ongoing impact of multiple economic disturbances: Covid, global energy prices, inflation, supply chain disruption and much more. As the cost of living continues to squeeze consumers, many businesses have lost sales and seen their profits disappear, while others will spend the next few years paying off loans taken out just to survive. It would be perfectly understandable if, faced with such challenges, a business put improving its environmental footprint well down the priority list.

In addition, many SMEs and larger businesses have office and factory infrastructure which make it less conducive to more sustainable working. The CCC puts the required investment costs in public and commercial buildings to 2050 at around £110bn¹³. There is also a more general risk that with so much focus on corporate environmental responsibility and the need to adopt more sustainable ways of working, many businesses could feel under pressure to rush to produce a net zero plan, or make ambitious decarbonisation commitments without working out how they will achieve them.



Research shows **three quarters** of UK businesses now have metrics in place to **measure environmental sustainability**¹⁴

Many businesses are aware of the challenges. Sustainability, with carbon reduction firmly in their sights, is a trend that has accelerated over the last five years. Research shows three quarters of UK businesses now have metrics in place to measure environmental sustainability, and almost the same number plan to introduce net zero emissions goals to their own operations and across their supply chains¹⁵. Businesses as a whole have bought into the need for net zero, they are committed to playing their part and feel they can make a positive difference when it comes to attaining the 2050 goal.

However, there is a growing gap between the ambition of businesses to make the change and the reality of the policies needed to support them in their move. While these are important, businesses are looking to see the kinds of specific actions – even if they are just small-scale pilots – that will need to happen across the economy to reach the target.



1.6bn kWh
E.ON delivers more than 1.6 billion kWh of heat to industrial customers

This is particularly true when it comes to large, energy-intensive industries such as the steel and chemicals sectors, that have been hit hard by energy costs and require clearer, more robust support on a short and long term basis alike. Until now, the retail sector has driven through much of the change: perhaps not surprising considering it deals directly with consumers who might base immediate purchasing decisions on seeing decisive examples of environmental consideration in action. For large consumers of energy however, it can be a difficult and long-term effort to change manufacturing processes when they have lower profit margins and less ability to commit to such transformation because of rising operational overheads.

Industry as a whole needs a policy framework on a national scale that drives deeper, faster change. That means being more ambitious when it comes to supporting the shift towards electrification, adopting greener gases such as hydrogen when available at commercial scale, accelerating incentives for energy efficiency and driving greater use of renewables. It also means further reducing our dependence on coal and gas, by changing taxes and subsidies to persuade businesses to switch, and setting a carbon pricing framework – and potentially the regulation around it – that includes long-range targets that encourage a shift away from fossil fuels within a timetable that is both realistic and cost effective.



There are other issues businesses face. We know many SMEs rent rather than own their premises so could face difficulties installing insulation, efficient heating or solar panels even if they wanted to. Yet from a landlord's point of view, the situation is equally problematic: any investments will add to their costs and take between 12 and 15 years to recoup. In addition, the benefits that do accrue are likely to come not to them, but to their tenants in terms of lower utility bills over the long term: any attempt to increase rents simply because the property is more sustainable is likely to be given short shrift. Tackling this split will involve such things as shared investment/revenue schemes, where both tenant and landlord agree to combine the cost and payback over a period of time, or a power purchase scheme where the landlord invests in technology such as solar and effectively 'sells' the energy into the leaseholder, creating a benefit for both.

There is impetus for change. Investors and customers, aware of the sustained public focus on environmental issues, are putting pressure on businesses to adapt. In 2020, the Financial Times reported that more than 500 investors including BlackRock and Pimco, with assets totalling more than \$47 trillion, had written to 160 of the world's largest greenhouse gas-emitting companies demanding they put in place a net-zero strategy for 2050 or earlier¹⁷. Meanwhile consumers often say they are willing to pay more for goods that they know have been produced sustainably¹⁸. Taking measures that will help speed up the country in its move to net zero emissions by 2050 could be among the clearest ways a company can demonstrate it is taking the environment seriously.



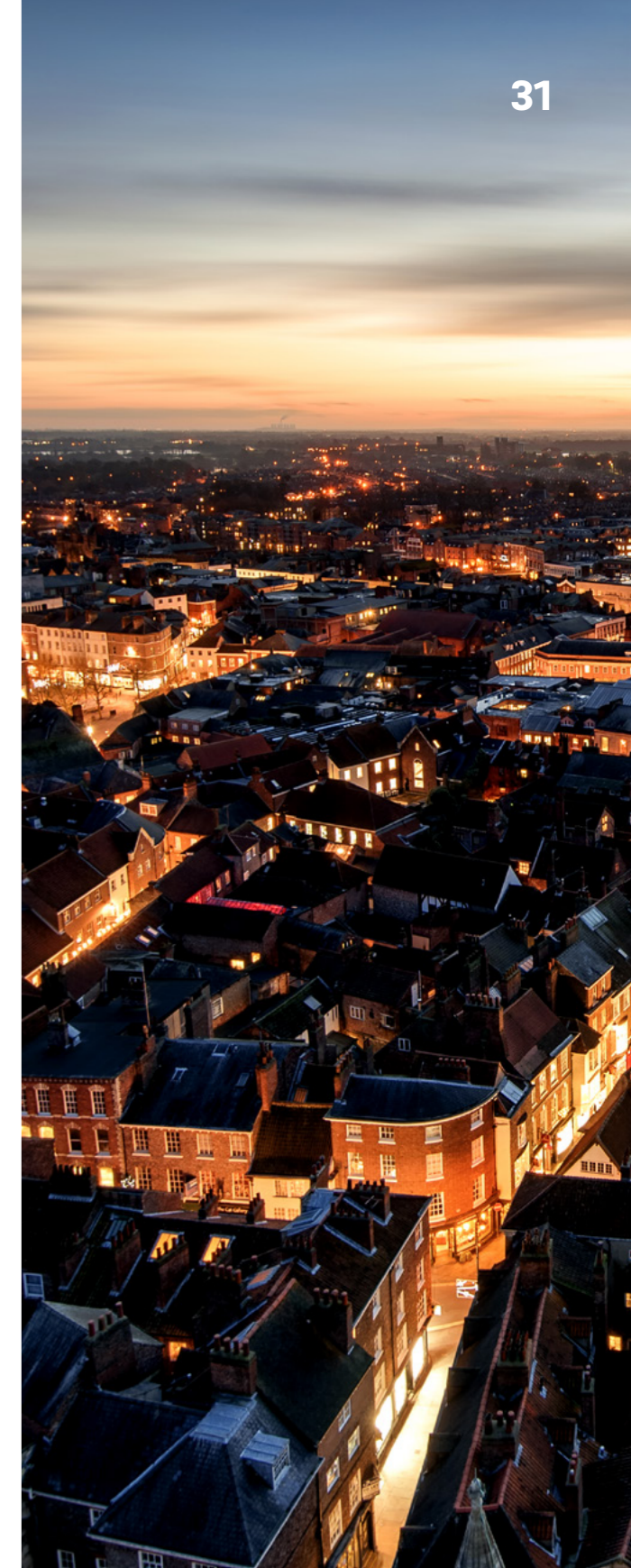
Consumers often say they are **willing to pay more for goods that they know have been produced sustainably**¹⁶



There is a further potential upside. Many employees now put the values a company espouses as a key reason to work there. Almost three fifths (56%) of the UK describe themselves as 'passionate' about seeing positive environmental change in the company they work for, but more than five million of the UK's employed population would be prepared to quit their job if it didn't become greener in the next ten years.

Being proactive in making their own move towards net zero provides a positive differentiator when it comes to recruiting the best, most motivated employees. A global survey last year found that job loyalty rises as businesses address employee needs, from diversity and inclusion to sustainability and reskilling¹⁹. Leading the way offers businesses the opportunity to develop and build a more loyal workforce with the skills and capabilities to help deliver the energy transformation, and by doing so engage a greater cohort of people who feel passionate about change.

Over the long term, responding to changes in these ways should create a virtuous circle, pushing businesses towards a greener path. Greater demand by businesses for an environmentally friendly supply chain will stimulate competition and drive down prices for green goods. Technological progress is also likely to help. When the decision to ban fossil fuel engines from new car sales was taken, many felt the target would be unattainable, yet setting a deadline has prompted innovation which has brought prices down. Similarly, the level of technological advancement in constructing windfarms over the last decade has meant the cost of renewable energy has dropped significantly in recent years. Setting targets for businesses to adopt greener technology or processes is likely to spur similar levels of progress, easing the costs of the transition.





Almost **three fifths (56%)** of the UK describe themselves as **'passionate'** about seeing **positive environmental change** in the company they work for²⁰

In summary, there needs to be a greater focus on businesses of all sizes to explain the benefits of changing. Businesses will also need greater clarity from Government of what is expected of them, with a clear roadmap of the policy framework that will achieve it. Critically however, those policies need to be developed without harming the country's international competitiveness. The Government will need to strike a delicate balance in supporting decarbonisation without increasing costs for businesses and making them uncompetitive against overseas rivals. The climate emergency is a global problem that would only be exacerbated by exporting jobs, processes and their associated emissions to countries which have lower standards, just because the UK has a tougher carbon regime.

E.ON leading the way: global drinks manufacturer

Scotland



We were approached by a global manufacturer – home to more than 200 beverage brands across 150 manufacturing sites – looking to reduce the environmental impact of one of their key sites in the UK that supplies products around the globe. This activity is in line with the company's global objective of becoming carbon neutral by 2030 and delivering 100% renewable electricity across direct operations.

E.ON created a tailored plan combining the installation of low carbon technologies over a phased period that offset fossil fuelled power generation and reduced carbon emissions, sending a clear message that the company is serious about taking action against climate change.

Our plan began with a 4.1MW array of solar panels on an unoccupied area of the site, followed by a 1.5MW wind turbine and energy efficiency measures including heat recovery systems across the site. The solar panels feature power optimisation technology which unlocks 25% more energy generation and requires 50% less technology, making the installation process quicker and more cost effective than conventional systems.

Longer-term, the energy measures on site would include heat pumps and heat recovery units, as well as potential for battery storage facilities to maximise efficiencies in power management for years to come. The energy generated on site will save the business in the region of £400,000 a year that would previously have been allocated towards fossil fuel power generation.

The proactivity of this business in seeking solutions is helping it to create a more sustainable business, as well as showing employees and customers the tangible changes it is making in the face of the climate emergency. This is in addition to standing out against competitors and now having a low-carbon asset in its network that can be used as a blueprint for further sites across Europe.

What businesses can do today

Playing a part in the carbon transition could feel like a low priority compared with simply staying in business, innovating and battling to keep ahead of the competition. Yet improving businesses' environmental footprint will be critical to the UK meeting its goals: in 2019 they were responsible for 18% of net greenhouse gas emissions²¹.

Some measures they can take include: generating and storing their own energy, perhaps earning a return on investment by supporting the grid at peak times, 'greening' vehicle fleets and working with staff to make more sustainable choices.

What E.ON is doing

We're working with our industry partners to make smarter buildings, allowing businesses to take control of their energy. In total, we've helped thousands of business customers reduce their carbon emissions over the last three years. We're helping them to generate it themselves and taking an active part in advising them on how to run their energy systems more efficiently. Established in 2005, our Energy Management Centre located in the heart of Glasgow remotely manages more than 6,000 business buildings across the UK and Europe. We've helped one of the UK's leading retailers use 34% less energy, on average, across more than 500 stores, and helped a major UK hotel and restaurant chain achieve energy savings of up to 35% across its sites through more efficient use of energy and appliances.

More information on how businesses can support the move to zero carbon is available at eonenergy.com/business/energy-efficiency



Investigating shared energy sources where waste energy from neighbouring businesses or other buildings can be reused and recycled



Adopting a 100% renewable electricity supply



Committing their supply chain to the same level of excellence



Conducting a sustainability audit to improve recycling and energy efficiency



Appointing an internal energy champion to drive change across the business, preferably a senior manager within the firm who can take responsibility for the effort



Installing building management systems to control mechanical equipment like lighting and power systems



Switching to more environmentally friendly heating technologies such as heat pumps or hydrogen for industrial processes



Make use of the flexibility from on-site generation or battery storage – this could be reducing demand on the grid or feeding power into the system at times of high demand or low supply



Generating and storing energy on-site solar panels, batteries, heat pumps, EV charging and other clean energy systems – with alternative funding models for rented premises that involve both the landlord and tenant in making the investment and reaping the benefit



Offering incentives for people to cycle to work



Ensuring operational efficiency to eliminate waste and unnecessary emissions



Adopting electric vehicles for company transport



25%

Transport
contributes
around 25% of
all **UK emissions**



Greening our cities: the challenges and opportunities

**“The solutions for
sustainable urban
development need to
be people-centric.”**

World Economic Forum

Transforming our cities and their infrastructure represents a huge challenge. Many of the issues associated with housing, transport and business are magnified many times over in an urban setting. Power and transport networks were generally built for an age that placed less emphasis on the environment, meaning cities are suffering more pollution and congestion than was ever envisioned, where getting around can be frustrating and time consuming, and where open space is at a premium. Building new infrastructure and installing new technology is more difficult in a sometimes dense, urban area.

£400bn estimated for investment in green infrastructure to meet 2050 targets


Figures bear out the scale of the problem. According to the UK Green Building Council: "The built environment contributes around 40% of the UK's total carbon footprint²²."

This is right in the front of the UK's consciousness. Three fifths (60%) of people across the country agree that environmental change starts with communities and businesses, yet almost half (46%) think their region is not yet doing enough to reduce carbon emissions and make life greener.

Yet if cities are part of the problem, they are also part of the answer. Bigger challenges mean bigger solutions; solutions which would not be appropriate or feasible in a suburban, village or rural environment. For example, dense populations mean energy can be generated and consumed in close proximity, reducing the need for high-scale distribution losses and taking advantage of smarter energy systems that allow the sharing of energy flows (such as using waste heat from business through heat networks) and reducing the gap between peak and off-peak demand times by storing and sharing electricity. Cities also offer the opportunity to solve the problems of a large population at the same time, engaging a wide community and redesigning work, leisure, shopping, and lower emissions transport and mobility.

The Covid-19 pandemic accelerated many changes already under way in our cities, changes involving a move towards more remote working, digitalisation and a greater emphasis on green transport. In the future that means we are more likely to see hybrid buildings – where people come together both to live and to work – as well as improved digital connectivity and a greater emphasis on quality of life²³. A fundamental rethink of how our cities are used, and the way in which they are reconfigured to meet our needs, will be required. The need to adapt our cities gives us a once-in-a-generation opportunity not only to change their purpose but also to upgrade their infrastructure and embrace greener energy.



35,000+ 
E.ON district heating customers
across 60 networks

Local administrations, mayors and other regional bodies often know their communities better than central government, and better understand their needs too. Cities can be in the vanguard, taking a community-wide approach to the issue, exploring innovative smart, sustainable projects to energise community groups and create healthier and fairer cities. And while this certainly includes the creation of new infrastructure, continued development of efficient retrofitting processes for existing properties is also paramount. It is also the top priority of consumers, with 57% of people wanting to see their local leaders take action to make homes and businesses greener and cheaper to run.

Local authorities as a whole will play a key role in driving change. As significant landlords themselves, they led the way in the 1990s in the installation of cavity wall insulation and condensing boilers across thousands of homes. Repeating the process with the new technology available will help generate a sense of momentum for the private housing sector to pick up on. The increase in home working thanks to the Covid-19 pandemic may also work in favour of transitioning our cities. Fewer commuters should mean less pollution and less overcrowding.

District heating schemes, which distribute heat generated in a centralised location through a pipeline network to houses and commercial properties, are likely to play a significant role in urban settings. They are more viable economically where there are multiple homes and businesses to heat in a dense area. And while they are easier to install in new developments, the scale of the gains means they can be appropriate – with the relevant planning and consultation – in existing urban areas too. Currently, however, the responsibility for planning and implementing these is often unclear. Nevertheless, such schemes create the opportunity to repurpose waste heat and ensure our energy goes further, providing an opportunity for cities to embrace more efficient heating with lower environmental impacts – both at a local air quality and national level.



59%

Indirect building emissions:
Buildings are responsible for 59%
of UK electricity consumption²⁶

Each of our cities faces its own unique challenge. Meeting those challenges will require central government and local authorities combined to take a longer-term view and will need substantial up-front investment. However, these solutions could lead to benefits in terms of attracting investment, improved air quality, social mobility, health and wellbeing over time. Our cities offer a way of speeding the move by both households and businesses to a greener future.

The Government believes up to 20% of our heating demand can be met by district heating by 2050, compared to just 2% today²⁴. That will only be possible if policies are put in place to drive better building standards and introduce zoning to make clear which parts of our cities are to be supplied in such a way. Moves like these will be important to incentivise district heating providers, as they will be assured of sufficient customers connected to the network to make the investment viable whilst providing customer-centric regulation and standards.

In broad terms there is likely to be a mix of solutions to cities' energy problems. Some may be appropriate for district heating while in others a better outcome could be fuelling homes with greener gases. Some urban areas may also be more appropriate when it comes to future development of hydrogen as a power or heating fuel. The CCC envisages geographic clusters of heavy industry where hydrogen can be developed as a solution²⁵. Where these are close to residential centres, it may be possible to link not just businesses, but also homes. In the future, our cities are likely to resemble a network of zones where different energy solutions are provided in different areas.



E.ON leading the way: Elephant Park

London

Cities are in a constant state of metamorphosis. Elephant Park is a major regeneration site in London, which is being redeveloped to include multiple building types (residential, business, education and leisure) with great transport connections into the centre of the capital.

As part of the regeneration, E.ON developed an eco-friendly, smart warmth concept for a community of 3,000 apartments, with capacity for over 50 shops, restaurants and cafes. Elephant & Castle energy system connects all the new buildings within the development to its own dedicated low-carbon energy centre. The energy plant includes high efficiency combined heat and power plant which are each capable of producing 800kW of electrical energy. The gas used within the energy centre is offset by the nearest available biogas sources. That means for every unit of gas used in the energy centre, E.ON makes sure the same amount of biogas is injected into the UK's gas grid. As part of a holistic concept, they guarantee a climate-friendly and sustainable heat supply via the combination of renewable energies, heat storage facilities and intelligent grids.

The project has transformed the area by creating a 45% reduction in CO₂ emissions from generation (compared to conventional gas boilers) and offers savings on energy costs to the surrounding community. As with other projects, community engagement is a key factor in generating public excitement and support for the project. At the heart of the development is the E.ON Energy Centre, where – through huge glass windows – people living and working locally can see the installed elements in technicolour and understand how the heat they use is sustainably generated.

What cities can do today

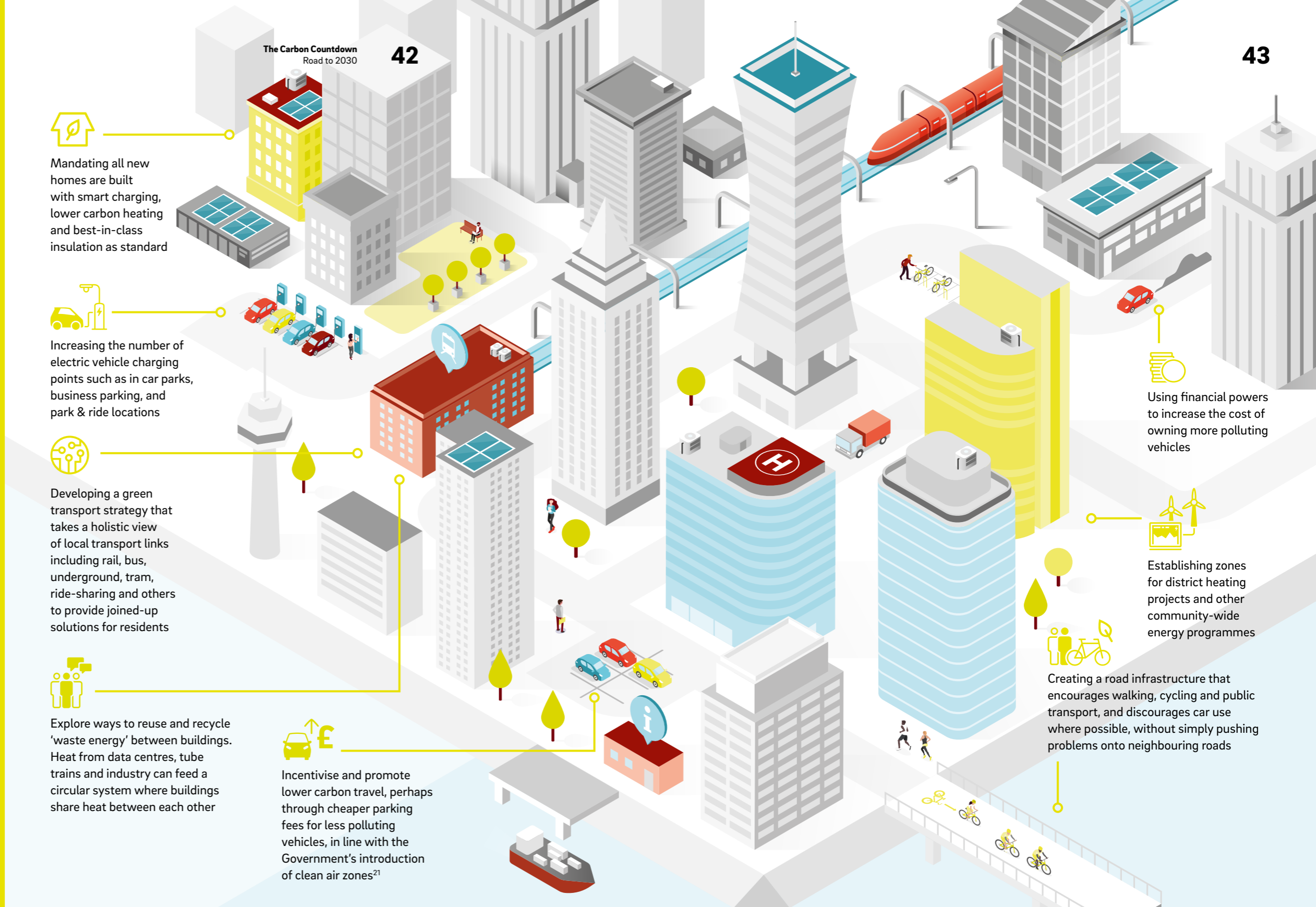
Unlike for householders and businesses, many initiatives in our cities cannot be undertaken quickly; decision making can be more complex, planning issues can take time. However, cities also bring scale and the potential to deliver significant changes and wholesale improvements across whole communities. That puts a premium on decision makers at all levels – both central and local Government – to identify responsibilities and timelines within which change can happen – or start to happen – quickly. We don't have to end the marathon this decade, but we do have to begin it.

Some of these immediate steps include: developing clean air zones and greater use of pedestrian or clean transport infrastructure. It could also include developing lower carbon heating solutions for who communities and mandating high energy efficiency standards for new-build developments.

What E.ON is doing

We work with local authorities right across the country, establishing the appropriate sustainable energy solutions for each location. We have been doing this for more than a decade, and have delivered a series of district heating networks and bespoke energy efficiency measures throughout the country. We also provide electric car charging points, 100% renewable electricity for homes and SMEs, solar panel installations, and greener heating and cooling for larger businesses.

More information available at eonenergy.com/business/challenge/smart-cities-and-communities.html



The Carbon Countdown
Road to 2030 42



Mandating all new homes are built with smart charging, lower carbon heating and best-in-class insulation as standard



Increasing the number of electric vehicle charging points such as in car parks, business parking, and park & ride locations



Developing a green transport strategy that takes a holistic view of local transport links including rail, bus, underground, tram, ride-sharing and others to provide joined-up solutions for residents



Explore ways to reuse and recycle 'waste energy' between buildings. Heat from data centres, tube trains and industry can feed a circular system where buildings share heat between each other



Incentivise and promote lower carbon travel, perhaps through cheaper parking fees for less polluting vehicles, in line with the Government's introduction of clean air zones²¹

43



Using financial powers to increase the cost of owning more polluting vehicles



Establishing zones for district heating projects and other community-wide energy programmes



Creating a road infrastructure that encourages walking, cycling and public transport, and discourages car use where possible, without simply pushing problems onto neighbouring roads



Streets of the Future

A visualisation of how net-zero cities might look across the breadth of possible urban infrastructure.

Streets of the Future



Julie Hirigoyen
Chief Executive,
UK Green Building
Council

We all live and work in buildings, we walk down the streets and through the communities that connect them every day. However, our buildings, towns, cities and the infrastructure that lies between significantly contribute to climate change.

The built environment is directly responsible for around one quarter of the UK's carbon footprint. For the UK to reach net zero by 2050, carbon emissions from this crucial sector must be substantially reduced. Whilst 2050 still feels far away, the reality is that by 2030 we must halve global emissions, so the next few years are critical.

The decade ahead is, therefore, crucial and we must use it to rapidly transform our towns and cities – both to decarbonise and to build communities that can adapt to a changing climate. Our streets will be at the heart of this change as we look for ways to protect vital resources including energy and water, enable nature to thrive and build communities that support environmental, economic and social wellbeing, and in doing so improve the quality of life of the residents.

The move to be more sustainable will drive significant changes within our buildings and across our streets; it has the potential to change life as we know it, supporting and enhancing the wellbeing of local individuals, businesses, communities and future generations.

Our Streets of the Future will see greater use of nature.

Nature provides services that mitigate climate change. It can enhance resilience, restore biodiversity as well as improve human health. We will see more rewilding, greenspace, roof-top gardens, green walls, and streets lined with trees to provide natural shelter from sunlight. Urban areas will utilise sustainable drainage systems to manage surface water runoff, mimicking the natural drainage process whilst enhancing biodiversity. Interaction with and exposure to nature provides a wide range of mental and physical health benefits for communities, such as improved-air quality and more space for exercise.

Streets will be modelled on the greater use of public transport.

Surface transport is the largest source of carbon emissions in the UK. One of the biggest changes we must embrace across our towns and cities is reduced dependency on private vehicle ownership, accompanied with more reliable public transport links. Public transport eases congestion, reduces emissions and air pollution, whilst connecting us with other across our community.



With fewer cars on our roads there will be less demand for multi-story car parks or on-street parking, opening up more space for pedestrians, for cafes to open up onto the street and welcome more customers, as well as more public parks and greenery.



Every building within our Streets of the Future will embrace smart technology, consume less energy and reduce reliance on fossil fuels.

Reducing the energy consumed through heating and powering buildings – in particular our homes – is key in our fight against climate change. We have one of the draughtiest housing stocks in Western Europe, meaning the increasingly costly energy we buy is leaking out of our windows, doors and walls.



In the near future, almost all existing buildings, including the UK's 29 million homes, will need to be upgraded to improve their energy performance and reduce their reliance on fossil fuels.

This will include greater use of roof and wall insulation, replacing gas boilers with heat pumps, installing solar panels on our roofs, as well as equipping our homes with electronic devices that enable us to remotely control how and when we're using energy to heat and light our homes.

Our Streets of the Future will give new life to old buildings.

The convenience of the online world means our high street is changing. Whilst there is less demand for certain shops and amenities to be physically available, this should not mark the end for the buildings they once occupied. In the UK, construction, demolition and excavation account for over half of material use and waste generation.

To ensure our Streets of the Future are less wasteful and more resource efficient, we will see greater re-use and re-purposing of existing buildings and building materials. We will see derelict buildings being revived and transformed into a mixture of high-quality flats, homes, and new businesses.

As we embrace the UK's transition to net zero it is vital that we change the way we construct, heat, power and renovate our buildings, as well change the relationship our built environment has with nature.

With change comes opportunity. Our Streets of the Future have the potential to deliver transformative benefits for our local communities and businesses. From cleaner air and warmer, cosier homes, to better transport links and more places to relax outdoors. Through embracing change, our streets will feel more inclusive, safe and better equipped to support the communities' sustainable lifestyles.





Pedestrianisation

- 1 Turning old car parks into pedestrian areas, gyms and play parks
- 2 More green spaces, trees, green walls
- 3 Biosolar roofs
- 4 Enhanced pedestrianised zones with wider pavements to take back the city for leisure



Transport

- 5 Fewer cars on the road, more car sharing, e-scooters and e-bikes
- 6 Available charging points for EVs, e-scooters and e-bikes
- 7 Landing pads for drone deliveries
- 8 E-delivery vans and more sustainable 'last mile' delivery solutions
- 9 Hydrogen as a solution for long distance travel and heavy industry energy needs



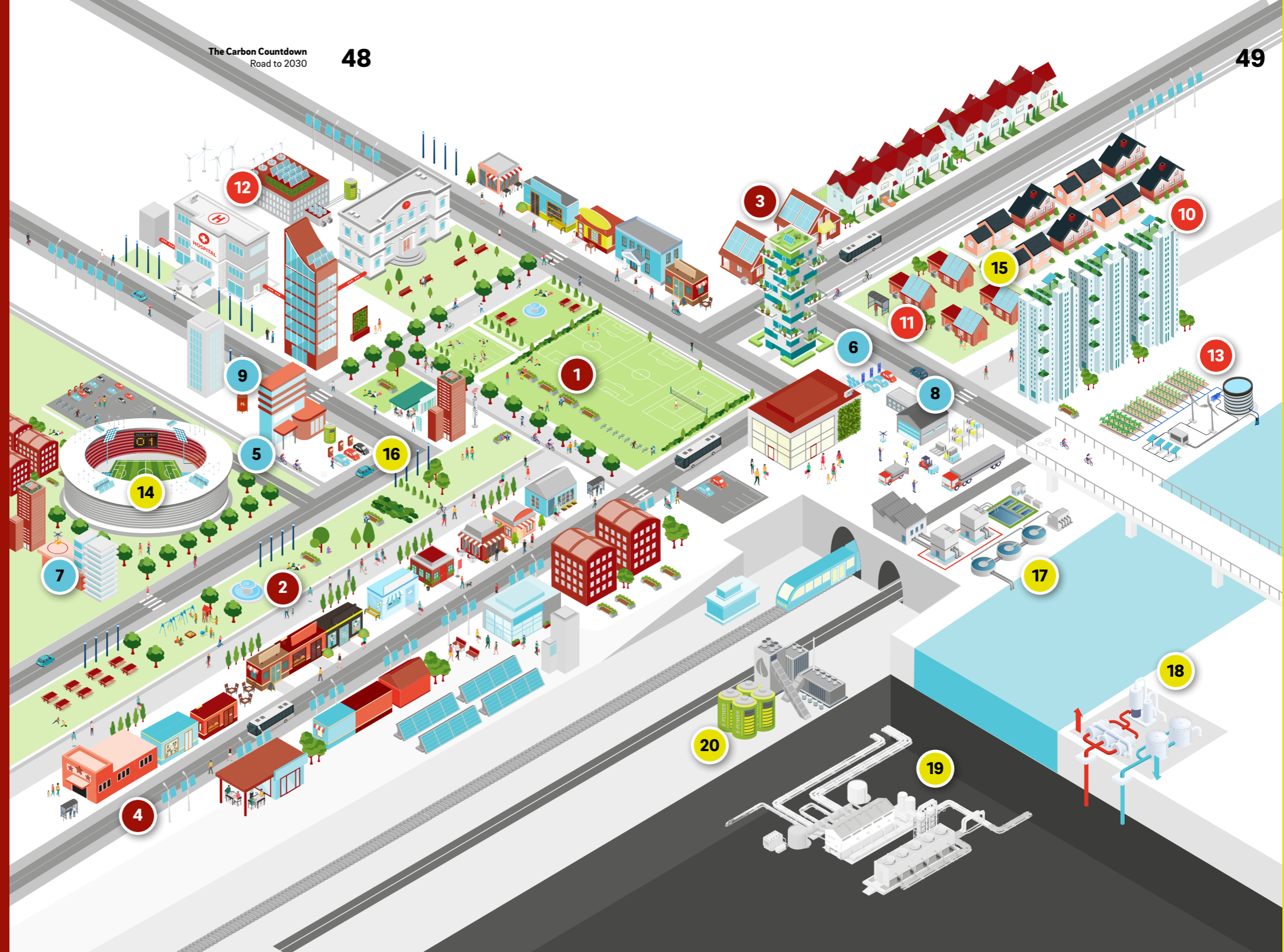
Construction

- 10 All new buildings developed to net-zero standard
- 11 New net-zero carbon buildings (inc. solar panels, solar glazing, heat pumps, insulation etc)
- 12 Retrofitted buildings (inc. solar panels, solar glazing, heat pumps, insulation etc)
- 13 Irrigation system to harvest rain and river water, and underground flooding solutions



Energy/Power

- 14 Fossil fuels replaced by more renewables
- 15 Sharing energy between commercial and residential buildings
- 16 EV batteries to support power needs (Vehicle to Grid solutions)
- 17 Repurposing 'waste' heat from sewers and underground railways
- 18 Capturing geothermal heat and storage from under the ground
- 19 Large commercial heat pumps and underground heat networks supplying urban areas
- 20 Battery storage to make best use of renewable power source



E.ON leading the energy transition

We have a rich history of being in the vanguard of change within the energy sector. Here are just some of the ways in which E.ON has taken tangible action to drive forward our collective transition to a more sustainable, low carbon future.


UK


6m 
UK customers

9,000 
UK employees

4.5m+ 
Smart meters
installed to date


1,600 
Business EV charge
points installed by 2022

39% 
Reduction in average per-
kilometer CO₂ emissions by
electrifying vehicle fleet

£3.5bn 
Invested in UK
renewables since 2009


340 
UK apprentices

E.ON Group across Europe

€12bn 
Invested in
renewables to date

Low carbon tech installed
in Europe to date includes:

10m+ 
Smart meters


125k 
Number includes solar,
battery, heat pumps and
EV chargers

36k+ 
EV charging points

CO₂ 
E.ON will be carbon
neutral by 2040

€60m 
Budget of Smart Quart, an E.ON
project that explores how individual
European neighbourhoods can achieve
a climate-neutral energy supply



Commissioned Europe's largest
rooftop solar array at an Audi
facility in Győr, Hungary


38m 
E.ON Future Energy Home and
e-mobility installations in 2020 led
to customer annual CO₂ savings of
more than 475,000 metric tonnes.
This is equivalent to a forest
of around 38 million trees


25 
We offer e-mobility
solutions in 12 countries


1.26m km 
The total length of
E.ON's networks

51.3m 
Customers across Europe

22,110 
Metric tons of carbon being
avoided each year through
two organic Rankine cycle
power plants in Germany

100% 
Our flagship cities project is to
supply an entire district in Malmö
– 300,000 people and hundreds of
businesses – with 100% renewable
energy by 2030

55-60% 
The average carbon savings delivered
by our decentralised energy generation
projects (CHP, solar) relative to
customer's previous energy use

€5.36bn 
By the end of 2021 E.ON had a
total of €5,35bn in Green Bonds
outstanding. A Green Bond is
a fixed interest security where
proceeds are used to fund low
carbon infrastructure and energy
efficiency projects



References

- ¹ UK Government press release, 27 June 2019
- ² CCC: "Building back better – Raising the UK's climate ambitions for 2035 will put Net Zero within reach and change the UK for the better," 9 December 2020
- ³ UK Government press release, 18 November 2020
- ⁴ CCC: "Building back better – Raising the UK's climate ambitions for 2035 will put Net Zero within reach and change the UK for the better," 9 December 2020
- ⁵ UK Government press release, 27 June 2019
- ⁶ House of Commons Environmental Audit Committee: Energy Efficiency of Existing Homes, 22 March 2021
- ⁷ CCC evidence to Parliament's Climate Change Committee, November 2020
- ⁸ BBC News, Green Homes Grant scheme to insulate houses axed, 28 March 2021
- ⁹ E.ON: Half of UK councils not confident of meeting self-imposed net zero targets ([Link](#)), 26 May 2022
- ¹⁰ House of Commons Environmental Audit Committee: Energy Efficiency of Existing Homes, 22 March 2021
- ¹¹ CCC: "Building back better – Raising the UK's climate ambitions for 2035 will put Net Zero within reach and change the UK for the better," 9 December 2020
- ¹² YouGov B2B Survey Results ([Link](#)), July 2019
- ¹³ House of Commons Environmental Audit Committee: Energy Efficiency of Existing Homes, 22 March 2021
- ¹⁴ HSBC, UK firms expect focus on sustainability to deliver growth ([Link](#)), 17 December 2020
- ¹⁵ HSBC: UK firms expect focus on sustainability to deliver growth, 17 December 2020
- ¹⁶ CCC: "Building back better – Raising the UK's climate ambitions for 2035 will put Net Zero within reach and change the UK for the better," 9 December 2020
- ¹⁷ CCC: "Building back better – Raising the UK's climate ambitions for 2035 will put Net Zero within reach and change the UK for the better," 9 December 2020
- ¹⁸ HSBC: UK firms expect focus on sustainability to deliver growth, 17 December 2020
- ¹⁹ The Financial Times: 'Influential Investor group demands 'net-zero' targets,' September 14, 2020
- ²⁰ E.ON, Green or go: Millions 'prepared to move away' if home towns don't go greener, major nationwide survey finds ([Link](#)), 27 July 2022
- ²¹ E.ON White paper, 'How SMEs can benefit from the green recovery,' 3 November 2020
- ²² Deloitte Global Millennial Survey, 25 June 2020
- ²³ 2019 UK Greenhouse Gas Emissions, Final Figures, 2 February, 2021
- ²⁴ UK Green Building Council: "UKGBC's vision for a sustainable built environment is one that mitigates and adapts to climate change"
- ²⁵ CCC: "Building back better – Raising the UK's climate ambitions for 2035 will put Net Zero within reach and change the UK for the better," 9 December 2020
- ²⁶ CCC: "Hydrogen in a low-carbon economy," ([Link](#)) November 2018



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