

A place-based approach to net-zero

How local insight, capability and connectivity can help the UK towards a better, faster, cheaper net-zero

Produced by the Net-Zero Infrastructure Industry Coalition



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Net-Zero Infrastructure Industry Coalition

This report was produced as part of the work programme of the Net-Zero Infrastructure Industry Coalition, formed in 2019 in response to the UK government's 2050 net-zero greenhouse gas (GHG) emissions commitment. Our launch report, ['Building a net-zero economy: planning](#)

[and practical action to transition our economic infrastructure for a net-zero future'](#) is available at mottmac.com. Coalition members include Mott MacDonald, Skanska, the UK Collaboratorium for Research on Infrastructure & Cities, UK Green Building Council, Anglian Water,

Transport for London, Engie, Pinsent Masons, KPMG, Energy Systems Catapult, Carbon Trust and Leeds City Council. The aim of our coalition is to harness our collective expertise to support the delivery of UK net-zero. Our belief is that net-zero must become an industry-wide mission that

transcends traditional business relationships to become a fundamental part of the way we all work, much like health and safety has over recent decades.

Our vision is that the UK's engineering and infrastructure sectors rapidly mobilise to meet the net-zero challenge.

Core team



Clare Wildfire

Global Practice Lead for Cities
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Clare is a leading engineer with a global leadership role in using urban systems to improve outcomes. Her main interests are sustainable and smart cities, and the built environment. Clare led the team that delivered this report.



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Change at Leeds City Council

Tom's role at Leeds City Council is concerned with achieving sustainable development. A significant priority in the city is attracting investment for low carbon energy infrastructure to address fuel poverty, increase competitiveness and increase resource efficiency. He is a Chartered Environmentalist and Fellow of the RSA and is currently seconded to Leeds Beckett University as a visiting researcher.



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Tom's research and knowledge cover many spheres, including infrastructure systems, interdependencies, resilience, sustainability, performance evaluation, need assessment and policy. Tom brought a creative approach and innovative ideas to our team.



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Luke is an experienced environmentalist and engineer with a passion for sustainable cities and zero carbon solutions. Luke has a wealth of experience in working across sectors and scales to realise ambitious environmental and sustainable outcomes.

Core coalition members



Foreword

“A city-scale transition to net-zero will require extensive collaboration between central government, local government and the private sector.”

I am pleased to share the results of a piece of work by the Net-Zero Infrastructure Industry Coalition, looking at the interplay between national and local government as the UK steps up its decarbonisation ambitions.

In May 2019 the UK government legislated to cut greenhouse gas emissions to net-zero by 2050, acting on advice and recommendations from its advisory group, the Climate Change Committee (CCC), that rapid and total decarbonisation of the economy is required to achieve a stable climate and a sustainable future. The Net-Zero Infrastructure Industry Coalition was set up to support the delivery of this UK net-zero commitment.

Achievement of the net-zero goal will require extensive collaboration between central and local government, as

well as with the private sector. For this work we chose to consider the city-scale transition, given the importance of cities to driving decarbonisation. Nonetheless, we acknowledge that applying place-based solutions is equally important outside our cities.

Through workshops and focused discussions with representatives from central government, city government and the energy and transport sectors we looked at the city transition through a ‘systems thinking’ lens – considering the multiple, complex systems that make up a city, and how they fit together. Others are looking at the policy space in this respect, so we concentrated on the infrastructure that operates within cities and how an improved understanding of the changes needed within and between these systems could help cities go further

and faster in support of the national commitments and their own climate targets.

Our findings covered topics such as partnerships and knowledge sharing, local applicability, mobilising local investment and unlocking local benefits. We have knitted this together into a four-pillar strategy with recommendations on Powers, Partnerships, Platform and People. It is clear that local insights, partnerships and solutions have the potential to add significant forward momentum to the national net-zero agenda.

Clare Wildfire
Global Practice Lead
for Cities, Mott MacDonald

Executive summary

“Cities have a critical role to play in support of the national drive for net-zero.”



The insights and influence held by cities can accelerate the national net-zero agenda by:

- mobilising enthusiastic local investment in locally applicable solutions that are not otherwise visible to the market, thus accelerating much-needed scale-up
- accelerating community buy-in to the lifestyle changes needed, through an understanding of local concerns and motivations

- improving access to local net-zero sources and resources.

Catalysing local solutions will support targeted local employment and bring other benefits that chime with national priorities, such as reduced healthcare costs and greater innovation.

The case for local action

Cities have a critical role to play in support of the national drive for net-zero. As major centres of production and consumption,

a large proportion of the UK's carbon emissions come from infrastructure that is within their boundaries. Yet city authorities do not currently have the power to directly influence many of these emissions.

Cities also feature concentrated and complex infrastructure systems involving multiple city stakeholders. This complexity means that when change is needed, especially on the scale required to achieve net-zero, it is advisable to adopt a systems approach.

Independent of the net-zero agenda, there is a business case for local authorities to look holistically at the services within cities. This is because when a city's systems fail, it is generally the public sector that has to pick up the bill. Treating the city as a system-of-systems can help city authorities understand where potential points of failure exist and highlight the best places to instil new resilience, resulting in lower long-term costs for the city.

The net-zero transformation will undoubtedly involve costs that are not reflected in our current markets. But that is also true of value; a local systems approach can derive previously untapped value by capitalising on co-benefits that are only visible or implementable at a local level.

Place-based systems thinking can bring benefits in the form of more effective leveraging of private investment, where sometimes it is the local mandate that stimulates market confidence in new approaches, enabling the minimum volume commitments that are required to mobilise the market and create local jobs.

City authorities can also help overcome public resistance, which is especially high when the messages are complex. Citizens that may not understand or be motivated by the climate change agenda can be inspired by related issues with a more direct and local impact, for example improved health.

A local acceleration of decarbonised transport and heat

The power of the place-based systems approach can be shown by focusing on two interconnected systems that are particularly challenging to decarbonise: transport and heat.

Achieving net-zero at city scale will involve a transformation in how energy is produced, transmitted and consumed. The impacts and costs of this challenge will be reduced if we make the energy we do have go further.

In transport, decarbonisation aligns with other pressing city issues such as health and safety. For example, improved air quality due to a reduction in use of fossil fuel vehicles will lead to a reduction in non-communicable disease such as asthma.

Cities can enhance the uptake of decarbonised road vehicles: for example, through preferential treatment of electric vehicle users. Restraint-based parking standards can reduce the attractiveness of the car for short trips. By improving alternative choices, through spatial proximity and provision of digital infrastructure, cities can increase social and economic resilience and influence society's reliance on motorised transport. There are multiple benefits to the city and citizen of such a

modal shift, from improved local high street trade due to increased footfall and dwell time to the health and wellbeing benefits of active travel.

The benefits of a localised energy transformation could be even more profound. Energy storage is a prime example of systems thinking in action. Currently, flexibility within our energy system is provided predominantly by adjusting generation to suit demand, but this will need to change as we rely more on inflexible renewable generation. Digitalised, decentralised energy systems create an opportunity to access the flexibility that exists in the end-user part of the system, that is in the thermal mass of buildings, the hot water tanks in their heating systems or the batteries within electric

vehicles. This means that cities represent a huge dormant flexibility asset.

Not only can cities spearhead local area energy planning to create visibility of opportunities for flexibility, but they can also catalyse the development of business models to mobilise local interests and support local employment.

Many of the solutions to decarbonising city heat will require collaboration between the public and private sector on joint local low-carbon energy schemes, whereby the city brings the opportunity and the energy utility companies and their backers bring both the investment and the delivery know-how. However, local authorities are not currently equipped with sufficient knowledge of the complexity of the energy system to successfully facilitate such arrangements.

A faster route to net-zero through a **four-pillar** cities strategy

Collaboration between national and local government is needed in the following four areas:

1.

Powers

There needs to be a common and consistent remit for city action, and the mandate to facilitate low carbon interventions where cities are best placed to accelerate change.

2.

Partnerships

New forms of partnership are required, within national and local government and with the private sector, with the common goal of long-term resilience that comes with investment in local sustainable approaches.

3.

(Data) Platform

System-level data must be used to improve integrated planning, the transparency and replicability of decision-making and to track outcomes such as carbon reduction, health and economic benefits.

4.

People

New skills must be developed within local authorities to manage these new powers and partnerships, and to act on new data insights.

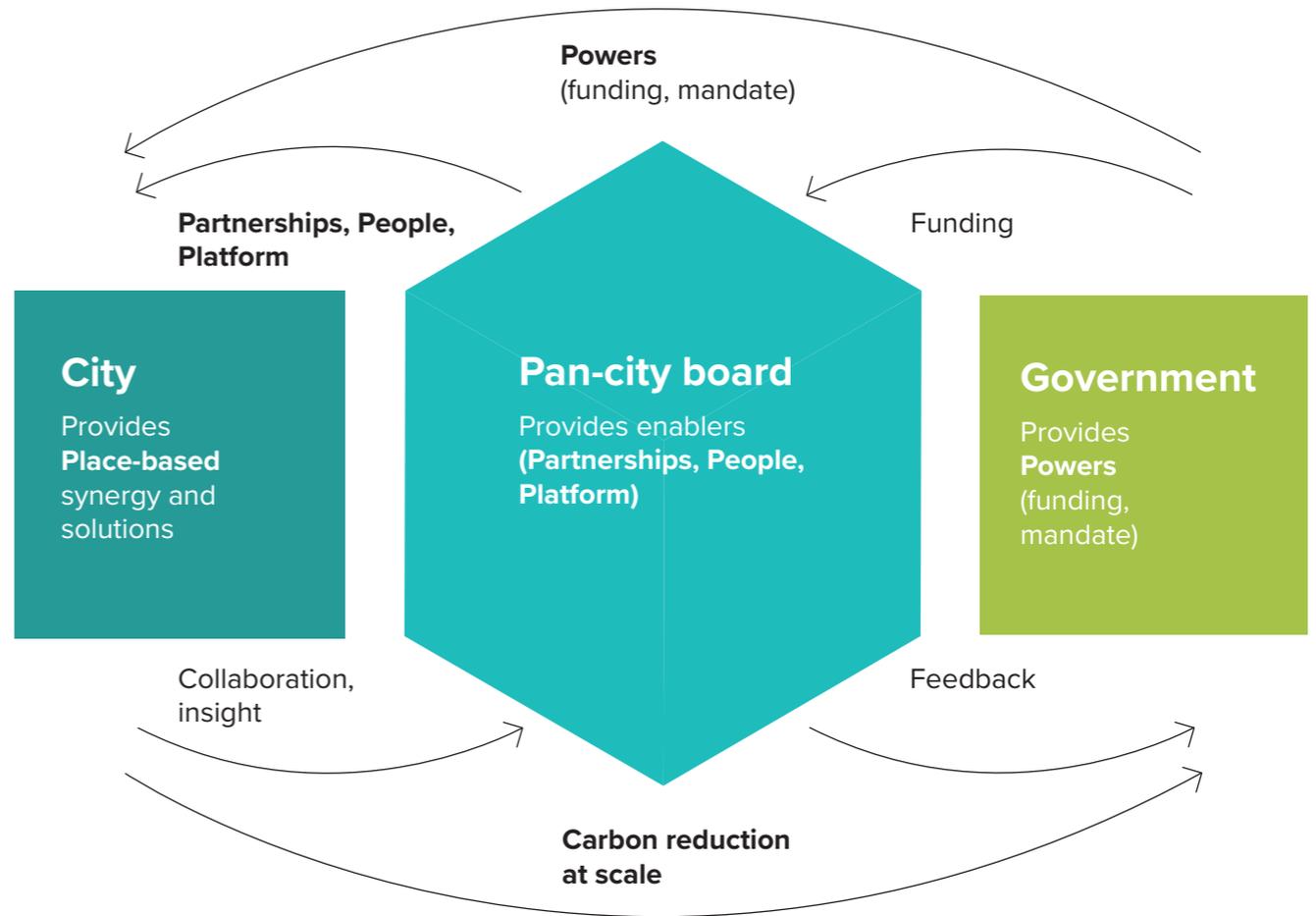
The continued and coordinated collaboration required to overcome significant systemic barriers can be fulfilled through a pan-city board that facilitates the individual and collective development of **Partnerships, People** and **Platform**, whilst acting as an expert advisor in relation to the introduction of increased **Powers**.

With representation from cross-departmental national government, local and regional government, regulators, industry and the professions, the board could provide expert facilitation between city, local authority and government, and consistency between cities.

This would include: training for local authorities in ‘systems’; disseminating information on low regrets approaches; promoting a city scale standardised net-zero measurement approach; facilitating industry partnerships; monitoring and sharing of progress; and supporting management of risk for early adopters.

More work is required to establish its structure, purpose, accountability and membership but, with the pan-city board in place, cities can confidently unlock the benefits of a place-based approach to designing and delivering their net-zero programmes and government can confidently set up a national mandate, release powers and provide funding.

A pan-city approach to secure place-based support to the national net-zero challenge



1

Why we need
a systems
approach
in cities



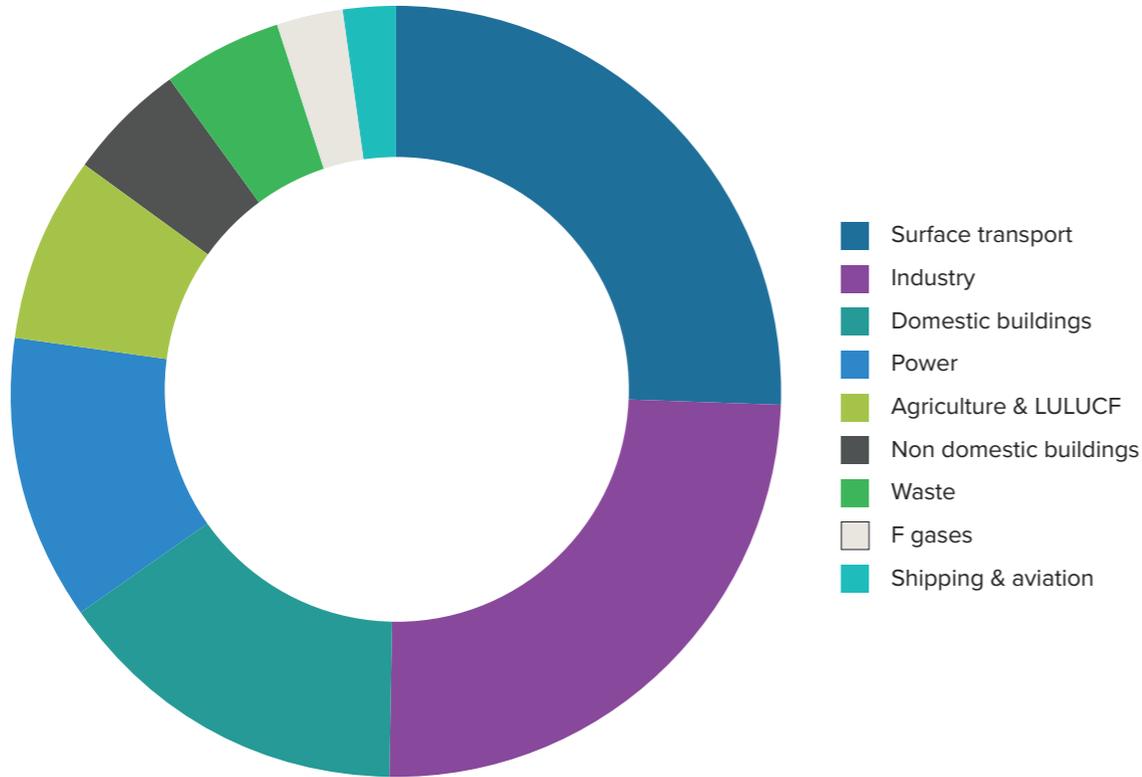


Figure 1: UK Production Emissions by Sector (2019)
 Source: Department for Business, Energy & Industrial Strategy provisional UK emissions 2019, on a by source basis – mapped to Climate Change Committee sectors, as presented in the National Infrastructure Strategy
 * Power represents electricity generation

In November 2020 the government’s Ten Point Plan for a Green Industrial Revolution was published, setting a far-reaching, economy-wide agenda covering many infrastructure sectors. The national commitment to reach net-zero has already been reflected at the level of local government: more than half the UK’s local authorities have already set ambitious climate targets and many have created action plans that outline how they will achieve them.

However, the barriers of power, jurisdiction and systems complexity have made it difficult for both national and local government to bring clarity to the role of the city in the net-zero challenge. It is apparent that:

- cities currently do not have the power to directly influence many of the infrastructure emissions that are within their boundaries, or there are critical gaps or blockers to using that power
- the ability of cities to realise climate ambitions is reliant on cities and national government working together¹
- the biggest reduction potential for cities is in the areas of transport and buildings, both being sectors with multiple and interrelated decarbonisation components (see Figure 1).

With the National Infrastructure Commission recommending that infrastructure should have a more local level of governance and the promise of a Devolution white paper, now may be the perfect opportunity to re-frame the role of the city in the transition to net-zero.

“Can we imagine getting to net-zero by 2050 without some localities getting there sooner? The current rules do not allow support for net-zero forerunners. How would we identify, support and resource them?”

Workshop participant, city consultant

As major centres of production and consumption, cities feature concentrated and complex infrastructure systems that operate within and between multiple city stakeholders across the private, public and third sectors, each with their own geographic scope and variety of functions and responsibilities.

This complexity lends itself to a systems approach when change is needed, as recommended by the Royal Academy of Engineering².

Coalition for Urban Transitions: ¹ <https://urbantransitions.global/en/publication/climate-emergency-urban-opportunity/>

² <https://www.theiet.org/media/5785/net-zero-a-systems-perspective-on-the-climate-challenge.pdf>

2

The business case for local action



Enabling more local responsibility may be a big undertaking, but there are many benefits that make it worth the effort.

When things go wrong, the interdependency of the systems operating within cities – for example, the roads and railways, the hospitals and schools, the energy, water and data networks – means that they can be disrupted by an escalating breakdown of service. In many instances of system failure, it falls to the city authority to find (and fund) a solution. Take traffic congestion: as well as bringing parts of a city to a standstill, it can cause levels of air pollution that are a danger to health, increase carbon emissions and significantly impact the local economy.

These connections and vulnerabilities mean that there is a strong case for city authorities to look holistically at the services operating within their boundaries. Treating the city as a system-of-systems can help city authorities understand where potential points of failure exist, and highlight the best places to instil new resilience, resulting in lower long-term costs for the city.

The increasing availability of data will assist in understanding how these systems interact, enabling better decision-making, more effective use of assets and improved predictions of cause and effect, thus increasing system resilience to climate change and other potential future shocks.

Local stakeholders are intrinsic to the net-zero conversation, given that they are part of delivering the solution. Their behaviours, perceptions and priorities may have been derived through decades of precedent, but in this current time of disruption when there is a need for significant change, it is appropriate to delve deep into the motivations that drive behaviour, to release new money flows, enable new operating models and reduce resistance to change.

“There is an interesting business case to make for systems thinking, because when systems ‘fail’, it is generally the public sector that has to pick up the bill.”

Workshop participant, city council

82.9%
of the UK
population
lives in cities

The net-zero transformation will undoubtedly involve costs that are not reflected in our current markets. But that is also true of value; a local systems approach can derive previously untapped value by capitalising on co-benefits that are only visible or implementable at a local level, and which can reduce the overall whole-life cost. It can also show up potential risks in the system, which if unmitigated would manifest as cost.

Cost benefit can come from more effective leveraging of private investment, where sometimes it is the local mandate that stimulates market confidence in new approaches, enabling the minimum volume commitments that are required to mobilise the market, support the economies of scale that will bring down cost and create local jobs. For example, in the transport sector, a local clean air zone based on evidence of local air pollution could become the catalyst for alternative transport action by local businesses: an electric vehicle (EV) fleet would become a no regrets solution for local firms and market confidence in EVs is therefore built.



Case study

An open road to better air quality

In 2013 the London Borough of Waltham Forest created its 'Enjoy Waltham Forest' programme that shifted prioritisation of road space towards walking and cycling. As a result of the programme the borough's air quality improved significantly, extending the expected life of the borough's children by six weeks. Whilst there was initially much resistance to the proposals, residents are now appreciative of the borough's vision for a healthy and low carbon future.

[Find out more](#)

carbon

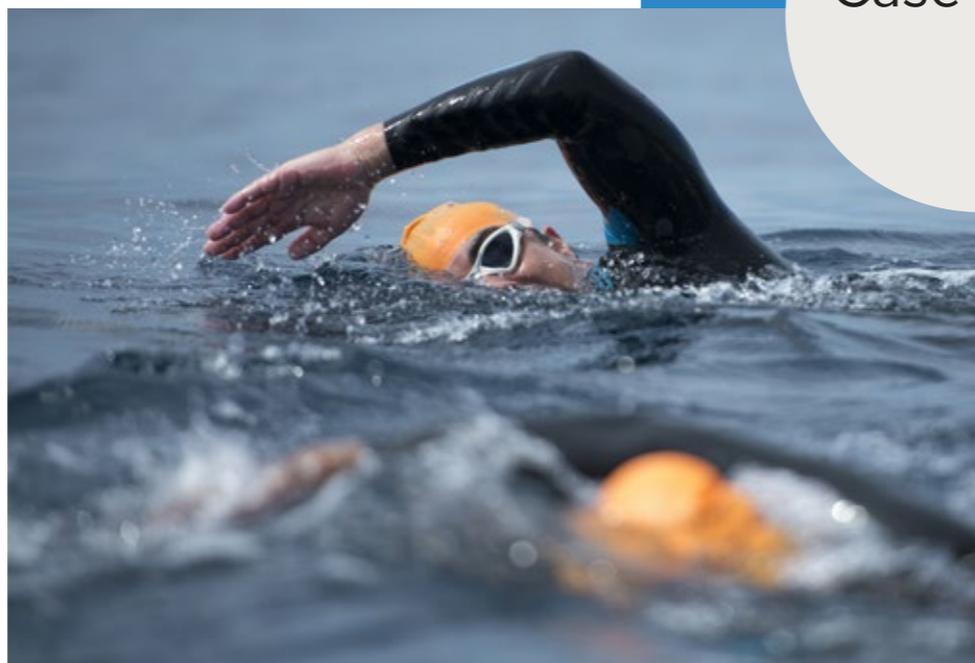
2.1 Mobilising the community

City authorities are able to help overcome public resistance, which is especially high when the messages are complex. Citizens that may not understand or be motivated by the climate change agenda can be inspired by issues that have a more direct and local impact, for example in improved health.

The sharing of information – both good news and bad – and making visible the consequences of different decision-making pathways can play a huge part in understanding what society values and what concessions people are willing to make for a resilient future.

Citizens' assemblies and other forms of participatory decision-making have had success in this respect, helping create supportive citizen action by discussing with them the long-term impacts of infrastructure related decisions. With the insights that can direct the conversation to local issues, cities are well placed to create this dialogue.

City authorities also have considerable convening power to mobilise relevant partners and promote collaboration. They can use their position as the democratically elected main provider of public services in a city and as a land and asset owner to catalyse local innovation that can be scaled and to encourage partners to add value in order to accelerate learning, knowledge and implementation.



Case study

Data helps Aucklanders swim safer

Auckland City Council has a digital twin data platform, Moata Safeswim, that uses data streams ranging from hydraulic statistics to global weather information to predict the water quality for its 29km of shoreline in real-time, helping 350,000 people enjoy Auckland's waters all year round.

During heavy rainfall the city's sewers can be overwhelmed, affecting the water quality of Auckland's beaches. The council has used the platform to show Aucklanders the relationship between the capacity of the city's wastewater system and the quality of the beaches' water, which led to the community supporting public investment in increased capacity of the city's wastewater system, a win-win for city and citizens.

[Find out more](#)

3

City solutions
for net-zero



Achieving net-zero at city scale will involve a transformation in how energy is produced, transmitted and consumed. We will need to increase both the supply of non-fossil fuel energy (e.g. the capacity of the city's electricity system) and the availability and uptake of new products designed to run off it (e.g. electric vehicles or electric heat pumps). If done well, this could lead to a new generation of rewarding careers and prosperity.

However, an understanding of local resources will be essential to maximise the opportunities, for example where there is potential to exploit waste heat from industry, unused land or the catalytic opportunities that flow from investment in new development.

The impacts and costs of the challenge will be reduced if we step up efforts to improve energy efficiency, to make what we have go further – meaning a radical transformation in our approach to energy conservation in design, construction and operation of city services and assets. We will need to understand our energy consumption habits better, how they are changing and where flexibility and different choices are possible. We will need to develop skills in network integration, within and across different types of energy. This will be significantly enabled by digitisation of the energy systems, to provide more efficient supply and more granular management of demand at different times of the day.

There are associated actions beyond the city boundary which are not explored in this report: for example, the decarbonisation of the electricity grid that makes electrification a low/zero carbon solution. Interdependencies will exist across this system boundary, and applying a localised, holistic approach will give opportunities for collaboration with energy suppliers: for example, using waste heat from power generation as an energy source for district heating.



Case study

Charge nudges commuters away from cars



Introduced in 2011, Nottingham City Council's Workplace Parking Levy (WPL) is a congestion charge designed to encourage employers to reduce the number of free workplace parking places they provide to staff and switch to alternative modes of transport. Commuters account for about 70% of congested peak traffic, costing Nottingham an estimated £160M every year with over half of this cost falling directly to businesses; therefore reducing congestion directly benefits local business.

An annual charge is levied on all city employers who provide 11 or more liable workplace parking places. The revenue is ring fenced by law and is spent on transport initiatives contained within the Council's Local Transport Plan. The WPL has enabled a step change in transport infrastructure, through leveraging in funding to more than double the size of the city's tram network, the upgrade of the main railway station, support for the 'Linkbus' network of non-commercial bus services,

and a business support package of travel planning and parking management.

Though now heralded as a success and a contributor to the city's high public transport use (40%), the WPL scheme took nearly ten years to become reality due to political complexity.

[Find out more](#)

3.1 Local transport transformation

Decarbonising transport will require a change both to the amount and the ways we travel.

Cities can enhance the uptake of decarbonised road vehicles, through preferential treatment of EV users, via clean air zone policies, and through intensive provision of on-street EV charging for residents without private parking. The power of the systems approach is evident in the alignment with other pressing city issues such as health and safety.

For example, improved air quality due to a reduction in tailpipe emissions will lead to a reduction in non-communicable disease (such as asthma) and thus increase life expectancy. And the low acceleration of electric buses compared with their combustion engine equivalents aligns with a desire to reduce city speed limits for safety reasons.

By improving the viability of public transport choices and the availability and attractiveness of active forms of travel, cities can reduce the need for the private car. They can also support a reduction in car miles travelled, through schemes that stimulate car clubs and car sharing. An overhaul of the current system of multiple city bus operators may enable overall improved efficacy, for example through smaller buses on more agile bus routes with integrated ticketing. Restraint-based parking standards can reduce the attractiveness of the car for short trips.

As we have seen with the restrictions placed on travel during the recent pandemic, digital connectivity can provide the means to access services online without the need to travel. We have also seen the significance of spatial proximity, as restrictions and safety concerns meant people have made more trips locally. By improving access choices, through spatial proximity and provision of digital infrastructure, cities can increase social and economic resilience and influence society's reliance on motorised transport. Improvements in digital connectivity have the potential to reduce the need to travel altogether, while focusing upon spatial proximity through the creation of mixed-use and walkable neighbourhoods could encourage people to make more of their necessary trips locally and via non-motorised options.

There are multiple benefits to the city and citizen of such a modal shift, from improved local high street trade due to increased footfall and dwell time to the health and wellbeing benefits of active travel. Cities can also mitigate the disbenefits, with the visibility to identify and create localised support for, for example, those with a physical disability who are reliant on the private car or those who can't afford broadband.

“By improving access choices, cities can increase social and economic resilience and influence the reliance on motorised transport.”



3.2 Local energy transformation

The benefits of a localised energy transformation could be even more profound. The transition needed to decarbonise heating and cooling in cities involves change across an end-to-end system, from energy generation through storage, transmission and distribution to new heating systems in all buildings, as well as requiring consumer acceptance and the adoption of new operating and maintenance practices.

Whilst some uncertainty exists over the role of hydrogen as a heating fuel, it is already clear that district heating and cooling should play a part in the decarbonisation of heat in cities and that improving the energy efficiency of buildings is an essential enabler of any future heat decarbonisation strategy, as is the need to improve the smartness of our energy control systems.

Energy storage is a prime example of systems thinking in action. Currently, flexibility within our energy system is provided predominantly by adjusting generation to suit demand. This will need to change as we rely more on inflexible renewable generation. Digitalised, decentralised energy systems create an opportunity to access the flexibility that exists in the end-user part of the system, that is in the thermal mass of buildings, the hot water tanks in their heating systems or the batteries within electric vehicles. This means that cities represent a huge dormant flexibility asset.

There are considerable whole-life cost reductions available by leveraging local flexibility, such as reducing investment in network reinforcement and in large-scale energy generation and storage capacity. Many of the energy assets we need for demand side flexibility already exist and, with the right powers, cities can play a role in mobilising them.

Given the influence of local factors on the effective and actionable solutions, national regulation is currently too blunt an instrument to drive the net-zero heat transition. Cities can be brilliant conveners. Not only can they spearhead local area energy planning to create visibility of opportunities for flexibility, but they can also catalyse the development of business models to mobilise local interests and support local employment.

However, there is currently a lack of funding available in cities to develop and maintain skills, as energy is not a statutory requirement for local authorities. Without these skills, local authorities are not equipped to understand the complexity of the energy system or to negotiate with and oversee the actions of seasoned market players such as energy companies, consultants and developers.

Many of the solutions will require collaboration between the public and private sector (as well as the third sector, community groups and residents) on joint local low-carbon energy schemes, whereby the city brings the opportunity and the energy utility companies and their backers bring both the investment and the delivery know-how. Even these private sector parties will be operating in largely uncharted territory, where risk will be a big agenda item. In this situation, the lack of public sector skills could hinder the creation of successful partnerships, as a stable policy landscape and the ability to engender trust will be essential components in persuading the private sector to come to the table.

Stepping up to the retrofit challenge

Since 2019 the Accelerator Cities Programme, led by UKGBC in partnership with EIT Climate-KIC, has brought together ambitious cities to catalyse the retrofit of emissions-reducing features to people's homes. The programme's outputs include the [Retrofit Playbook](#), which helps local authorities develop a retrofit strategy, and the [Interactive Policy Map](#) which highlights leading initiatives and partnerships within the UK to drive knowledge share.

[Find out more](#)



Case study

Low-carbon heat warms former power station site

2,300
new dwellings

with low-carbon
heating

ENGIE is redeveloping the former Rugeley power station site in Staffordshire into a mixed-use development with 2,300 new dwellings, including the extensive roll-out of heat pumps to provide low-carbon heating.

Dialogue and engagement with the community, Cannock Chase District Council, Lichfield District Council and Staffordshire County Council, led to the identification of the opportunity to explore applying principles of local area energy planning to the Rugeley

community and their existing infrastructure. BEIS (Department for Business, Energy & Industrial Strategy) funding was subsequently provided for ENGIE to form and lead the Zero Carbon Rugeley (ZCR) consortium to develop a Smart Local Energy System (SLES) design.

The SLES seeks to extend the installation of low-carbon heat to the wider community beyond the power station project's red-line boundary, enabling faster and more cost-effective carbon reductions.



This is a leading example of an integrated approach to place-based development that considers wider energy system outcomes, demonstrating the potential for such collaboration to enter mainstream practice.

[Find out more](#)

4

A faster route to net-zero through a place-based agenda





Suitably empowered and supported, cities can use their local insights and influence to accelerate the net-zero agenda in the following ways:

- mobilising enthusiastic local investment for locally applicable solutions that are not otherwise visible to the market, and thus accelerate much-needed scale-up
- accelerating community buy-in to the lifestyle changes needed
- improving access to local net-zero sources and resources.

With greater insight into the local city-system synergies that would otherwise not be visible, there is also the likelihood of other benefits that chime strongly with national priorities, such as local economic activity, reduced healthcare costs, reduced inequality and greater opportunity for innovation.

“A national framework can set direction, context and publicity programmes plus provide cities with the remit. Cities can then implement with focus and enthusiasm.”

Workshop participant, national government representative

4.1 Enablers for the city contribution to the national net-zero challenge

Capitalising on the opportunity to integrate the city into the national net-zero journey will require intervention in four key areas, related to **Powers, Partnerships, People** and data insights (**Platform**).

1. Powers

Cities need a common and consistent remit for action and the mandate to facilitate low carbon interventions where they are best placed to accelerate change.

There are many areas where, with an enhanced mandate, cities could accelerate carbon reductions within their jurisdictions. These include integrating local area energy plans with local development plans, stepping up carbon-reduction requirements for existing development, creating the conditions

for car-free lifestyles and incentivising manufacturing of products such as EVs.

With the right mandate through a national framework, cities are well placed to implement regulation with focus, enthusiasm and local knowledge. They are also well placed to understand and negotiate the political risks associated with new policies – acting as an enabler for locally specific opportunities.

We need a national framework that:

- sets the city net-zero purpose, as one that is based on accelerated local action, local benefits and synergies
- creates a national publicity programme to celebrate the benefits of local intervention
- provides devolved net-zero powers at combined authority or city level
- is accompanied by new and amended legislation and policy where needed
- provides targeted funding for city interventions, starting with front-runners and pilots, alongside an entity that brings learnings back to the centre.

Case study

A leap forward for Bristol

Bristol City Council recognised the need for partnering innovation in its City Leap initiative; bundling a series of energy and infrastructure investment opportunities into a far-sighted prospectus representing more than £1bn of investment towards Bristol becoming a zero carbon, smart energy city by 2030. The council issued a call for potential organisations, investors and innovators with the vision and energy to join them in becoming the architects of Bristol's sustainable future – to create jobs, maintain economic competitiveness, decarbonise the city and empower people to take their future into their own hands. Three consortia have been chosen to progress through to the final stages of the procurement exercise.

[Find out more](#)

2030
deadline for
a zero-carbon
Bristol

2. Partnerships

New forms of partnership are required, within national and local government and with the private sector, with the common goal of long-term resilience that comes with investment in local sustainable approaches.

With the new forms of value that stem from understanding local interdependencies comes the need to look anew at the relationships that exist to create that value. Successful partnerships will rely on sophisticated handling of the multiple areas of risk and reward, well beyond the transaction-based contracts that currently feature in local authority interaction with the private sector.

The visionary Project 13³ from the ICE's Infrastructure Client Group contains a wealth of insight on transforming the public/private relationship away from the transactional towards

an enterprise-based view of incentivising performance and rewarding contribution. Embedded within this approach is the importance of understanding the motivations of the different entities if lasting trust is to be created.

In the city context, with something as complex and far reaching as climate change, it is important to take time to explore where local business benefit can be married with long term public good. It is capitalising on the beneficial local impact that will catalyse a virtuous investment cycle of commitment, market response and scale-up that will accelerate bottom-up change.

It is evident from the individual city action plans that the similarities are greater than the divergences, meaning that acceleration is possible by cities learning from each other. We need an increased

focus on several types of partnership, including:

- between local authorities, for pooled knowledge and shared learning across local authorities, so that they are learning together and from nominated front-runners
- with government, for access to government specialisms and a remit to share insights
- with national agendas, for alignment of national public asset owner strategies with the benefits of local intervention
- with the private sector, for visibility of local need and space to create affirming dialogue with an engaged range of stakeholders; and for entraining local private sector buy-in to, and strategic alignment with, a net-zero future for our cities.

³ [Project 13 | Institution of Civil Engineers \(p13.org.uk\)](#)

Case study

An outcome-focused regional alliance

The alliance serves **6 million customers**

In 2005 Anglian Water created the @one Alliance, recognising that it needed the unique skills and ideas from its supply chain to maintain industry-leading performance. It engaged partners at outcome level, giving them the opportunity to develop innovative, streamlined solutions and challenge existing standards in the delivery of customer-led solutions for 6 million customers. The result achieved significant improvements in cost, carbon reduction and time.

Working collaboratively with seven delivery partners and their supply chains, the alliance now delivers more than half of Anglian Water's capital investment programme and claims a position as a nationally leading alliance because of the capability and expertise of its partners.

[Find out more](#)

3.

Platform

System-level data must be used to improve integrated planning, the transparency and replicability of decision making and to track outcomes such as carbon reduction, health and economic benefits.

The city's contribution to net-zero, through creating systems-based opportunities to accelerate change as articulated above, is dependent on the visibility of local benefit and the ability to assess current city level baselines and to track the carbon emission reduction impacts over time.

Currently there is no standardised UK method for cities to identify or quantify the sources of GHG emissions caused by production and

consumption activities within city boundaries. The Greenhouse Gas (GHG) Protocol for corporate supply chains is ambiguous in the city context, and its city scale equivalent, the GPC⁴ is not widely adopted. Nor is it the norm to assess systems level cause and effect between decisions and outcomes across a city's departmental boundaries. Indeed, even the common terminology does not exist, not just in carbon literacy terms but also for integrating technical systems that have historically been separate enough to evolve their own language.

We need system-level data platforms to enable:

- net-zero actions to be evaluated (valued) based on multiple synergetic objectives, not just carbon reduction but also impact on local air quality, flood risk, food poverty, energy poverty, health and wellbeing
- new shared and mutually appreciated language and terminology to allow stakeholders to interact efficiently and productively in this area
- a methodology for measuring and monitoring city carbon emissions, covering all three GHG scopes from the perspective of all supply chain levels.

⁴ GHGP_GPC_0.pdf (ghgprotocol.org)

Case study

Wellington makes strides on carbon footprint

Wellington, New Zealand, has been tracking its carbon footprint since 2001, achieving a reduction in total gross emissions during this time of 7% against successful economic growth (24% population growth and 59% GDP growth) and showing that the city has been successfully decoupling emissions from economic growth.

With the data collected, the city has been able to create a robust plan to make Wellington a zero carbon capital by 2050. It has also developed New Zealand's first gamified carbon calculator, FutureFit, to help its people to make choices to reduce their impact on climate change. FutureFit lets people in Wellington work out the carbon impact of their lifestyle and choose positive changes in the way they live to help reduce it.

[Find out more](#)

7%

reduction in Wellington's carbon footprint since 2001

4.

People

New skills must be developed within local authorities to manage new powers and partnerships, and to act on new data insights.

The system-based approach is a departure from current silo-based responses to the net-zero challenge. Delivering whole system benefits that are fair to the whole of society will involve the development of a new suite of skills and competences, with a greater emphasis on:

- partnership between city stakeholders, including those who are not used to collaborating with one another
- sharing of insights, both the good and the bad, on the net-zero journey
- collecting and analysing data across multiple city operations.

We need:

- city authorities to become informed and intelligent clients who can handle their important role
- new collaborative behaviours, including the understanding of what makes an effective partnership and what can hinder or stymie one
- adapted procurement approaches, more focused on system outcomes than service outputs
- the capability to appreciate and interpret system-level data
- an institutional ability to promote the cross-sector synergies that will bring partners to the table, motivate citizens and reduce the whole life cost of the transition
- resource to recruit, retain and train the right workforce
- net-zero literacy and awareness across the wider population.

Case study

Sharing skills in Leuven 2030

The European Institute of Innovation and Technology's Climate Knowledge and Innovation Community (EIT Climate-KIC) creates partnerships for change across business, academia, and the public and non-profit sectors.

Its Healthy, Clean Cities programme is working with the city of Leuven, Belgium, to support Leuven 2030 – a non-profit partnership organisation set up in 2013 in response to the imperative to curb the city's climate emissions. The programme offers a wide range of expertise and a wealth of ideas, cutting across traditional silos and organisational barriers. The partners include the city government, citizen groups, knowledge institutions, companies and investors.

Leuven's plan has widespread ownership, driving meaningful change across over 80 action areas. Outcomes have included increased citizen support for transport-curbing measures in the city centre, and significantly, no increase in city emissions since 2010.

[Find out more](#)





Case study

Bringing down vehicle emissions in the Black Country

Four local authorities in the Black Country (Wolverhampton, Sandwell, Dudley and Walsall) are sharing skills and resources via the Black Country Transport initiative, with the aim of accelerating and amplifying the electric vehicle transition in the region.

This is being achieved through a shared end goal and action plan, shared public engagement around behaviour change, and a shared commitment to providing EV infrastructure. The authorities are leading by example by changing their own fleets to EVs well in advance of the ban on sale of new diesel.

By 2025 the strategy is expected to deliver significant emissions reductions and over 95% of urban areas to be within 500m of a public charge point. Associated cost savings due to a reduction in emissions damage costs, in the region of £20-50m savings annually by 2030, are also expected.

This collaboration will accelerate regional progress towards net-zero.

[Find out more](#)

95%
of urban areas
will be within
500m of a
charge point



Case study

Systems thinking in water sector leads to new investment priorities

Water Resources South East, an alliance of the six water companies covering South East England, is developing a 75-year adaptive plan to maintain water resilience in our towns and cities. Looking at the water system in a broader social, environmental and economic context has highlighted new factors to consider in investment planning, including:

- soil health; as an upstream enabler of resilience in water supply, agriculture and environment, with additional benefits for carbon sequestration
- customer trust; the link between people's trust in how resources and leakage are managed by water companies and their own adherence to hosepipe bans and other drought restrictions
- collaborative land management; enabling adaptation of the landscape over the long term to maximise natural capital and minimise the negative impact of land use change.

The work has also led to a better appreciation of the risks affecting food production and the varying ways in which this risk can be perceived and managed.

[Find out more](#)

4.2 A four-pillar strategy enabled by a pan-city board

Using a four-pillar strategy of **Powers**, **Partnerships**, **Platform** and **People** to accelerate the city contribution to net-zero through a place-based approach will require continued and coordinated collaboration to overcome significant systemic barriers.

Even with a national mandate, the format of the individual city devolution deals may not provide the appropriate vehicle to resolve the issues identified, given the bilateral nature of their agreement between government and city. The Sector Deal⁵ approach contains more flexibility to include additional parties that can

contribute to the outcomes of the agreement, but does not include the disaggregation in accountability needed at city level. The solution for net-zero may be to insert a ‘pan-city’ entity that facilitates and streamlines the conversation between national and local government on the topic of net-zero, whilst also having agency to upskill, monitor, collate and disseminate within and across individual cities. This could be an expansion of the current Local Energy Hub⁶ concept, with separate regional hubs to recognise broad regional differences in appropriate approaches and solutions.

This entity, suggested as a pan-city board, facilitates the individual and collective development of **Partnerships**, **People** and **Platform** to deliver carbon reduction at scale, whilst acting as an expert advisor in relation to the introduction of increased **Powers**. It provides the oversight such that cities are able to bring forward locally applicable solutions within the constraints of a strategic framework; a framework that may evolve in response to advice from the board.

⁵ A sector deal is part of the UK industrial strategy process for partnerships between government and industry on sector-specific issues that can create significant opportunities to boost productivity, employment, innovation, and skills at UK plc level.

⁶ Five government funded Local Energy Hubs have been created across England to increase public sector capacity to bring forward energy schemes at arm’s length from BEIS, with flexibility to agree objectives that align with local needs. They have Local or Combined Authorities as accountable bodies for funding, and public sector representatives on boards.

With representation from cross departmental national government, local and regional government, regulators, industry (energy supply, service operators) and the professions (engineering, legal, academic) the board provides expert facilitation between city, local authority and government, and consistency between cities. This includes:

- training for local authorities in ‘systems’
- disseminating information on low regrets approaches
- promoting a city scale standardised net-zero measurement approach
- facilitating industry partnerships
- monitoring and sharing of progress
- supporting management of risk for early adopters.

More work will be required to establish its structure, purpose, accountability and membership, including whether in fact it can be an extension of an existing body. But with the pan-city board in place, cities can confidently unlock the benefits of a place-based approach to designing and delivering their net-zero programmes and government can confidently set up a national mandate, release powers and provide funding.

A pan-city approach to secure place-based support to the national net-zero challenge



Appendix: list of contributors

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National Infrastructure Commission
Northern Gas
Northern Power Grid
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