



City of
Stoke-on-Trent

Stoke-on-Trent City Council **Energy Strategy** 2023-2033



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Glossary

CO²	Carbon Dioxide
CHP	Combined heat and power (systems which can generate or harness both heat energy and electricity)
DHN	District Heat Network
EV	Electric vehicle
ERF	Energy Recovery Facility
GW	Gigawatts (units of one billion watts of energy)
GWh	Gigawatt hours (a measurement of the amount of energy produced/consumed)
kW	Kilowatts (units of 1,000 watts of energy)
kWh	Kilowatt hours (a measurement of the amount of energy produced/consumed)
kW/h	Kilowatts per hour (rate at which energy is generated or consumed)
MW	Megawatts (units of one million watts of energy)
MWh	Megawatt hours (a measurement of the amount of energy produced/consumed)
PV	Photovoltaics (the direct conversion of light into electricity)
ULEV	Ultra-low emission vehicle

Introduction

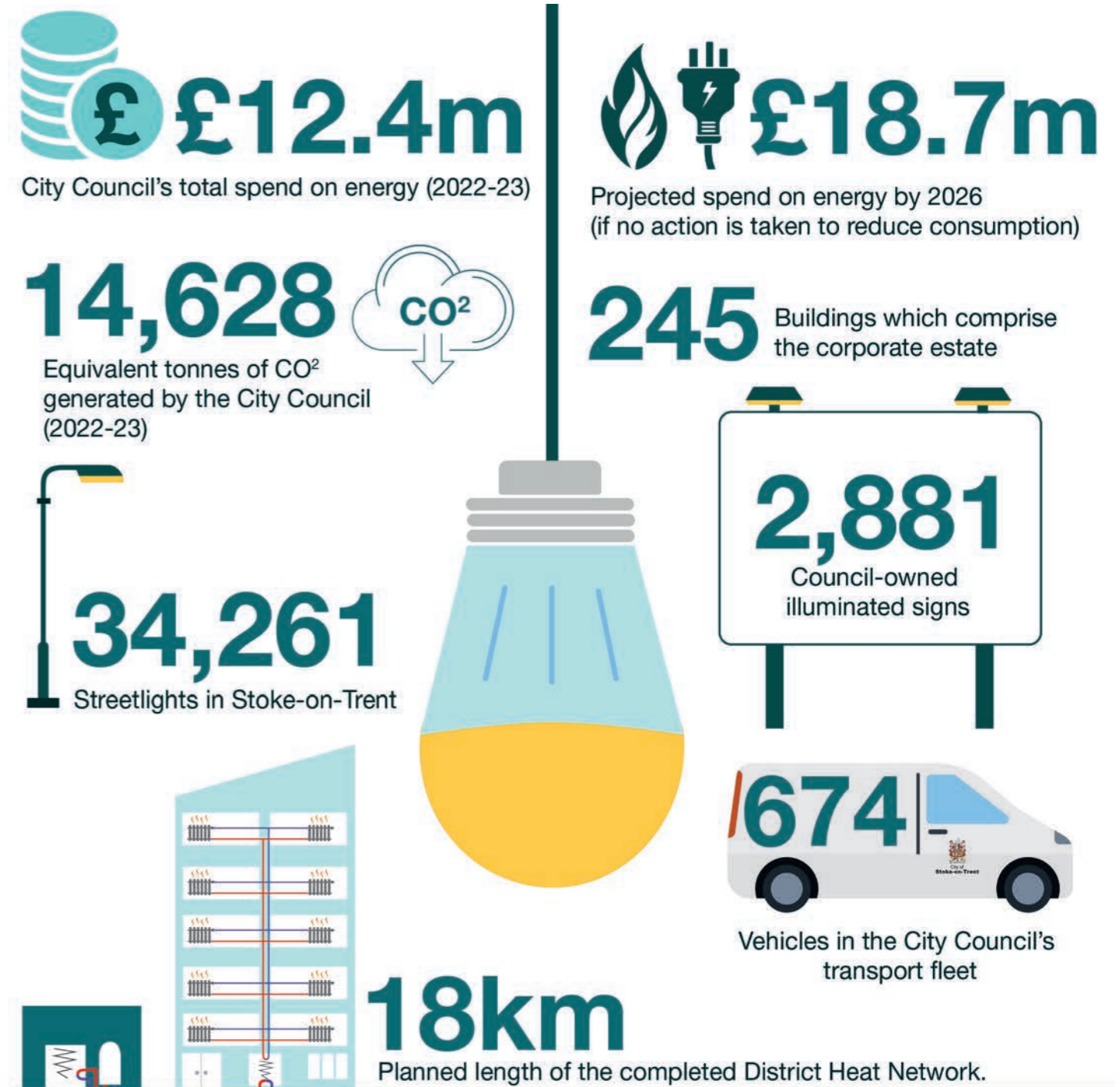
This strategy provides a policy vision and outline action plan for the next 10 years in relation to Stoke-on-Trent City Council's ambition to reduce energy consumption and carbon emissions in line with the UK's commitment to achieving net-zero status by 2050. It also aims to provide a single, coherent rationale for the multiple priorities and areas of activity which the City Council aims to pursue over the next decade in order to achieve its energy objectives.

The rationale underpinning this strategy is reinforced by comprehensive data provided by a detailed assessment and benchmarking study carried out by energy infrastructure firm Siemens, which examined every element of the City Council's corporate estate and operational assets. The result is an evidence-based strategy which sets out ambitious, yet achievable goals and is focused on delivering a range of positive outcomes for the City Council. The accompanying action plan lists the key activities which will be undertaken across the short, medium and longer term in order to achieve these outcomes.

It is important to emphasise that this is a City Council strategy, rather than a citywide approach to energy and decarbonisation. It is only concerned with how the local authority heats and powers the buildings within its direct ownership and control, and how its workforce moves around the city in the course of carrying out official duties. The strategy therefore does not apply to the broader public sector estate within Stoke-on-Trent, such as schools, car parks or the city's social housing stock.

While the strategy does refer to potential wider benefits which may arise as by-products of council investment in more efficient, low-carbon energy infrastructure and systems, these do not fall within the scope or aims of this strategy.

Key facts and figures



Compliance with UK CO² reduction targets for all public buildings:

2017-18 emissions baseline:
17,377 tonnes

2022-23 emissions reduction:
5,540 tonnes (32%)



2032 target: **50% reduction (-3,148 tonnes)**
2037 target: **75% reduction (-7,492 tonnes)**
2050 target: **100% reduction (-11,837 tonnes)**

An energy vision for Stoke-on-Trent

The City Council will harness its low-carbon energy generation capabilities and assets, as well as its game-changing digital infrastructure, to achieve genuine energy self-sufficiency, transform its financial sustainability and become an influential beacon for decarbonisation across Stoke-on-Trent and the wider city region.

This strategy is a response to a number of important challenges and opportunities which currently face Stoke-on-Trent City Council in relation to energy:

- In common with other local authorities, the City Council is dealing with financial pressures linked to inflation and levels of demand for local services, and the abnormally high energy price rises which have occurred since autumn 2022 are driving some of these pressures.
- As a large employer and service provider with responsibility for shaping and delivering key policy approaches locally, the City Council has a duty to help to address the global climate change crisis. There is an expectation that local government will follow central government's lead in pursuing ambitious and legally binding decarbonisation targets.
- Stoke-on-Trent is emerging as a trailblazer for energy innovation and digital connectivity following the successful delivery of the District Heat Network and the citywide full-fibre gigabit-enabled network.
- The City Council has risen to national prominence for its approach to Levelling Up , and is well placed to capitalise on emerging green energy opportunities.



Priorities

Priority 1 - Reduce energy and fuel consumption to reduce cost and carbon

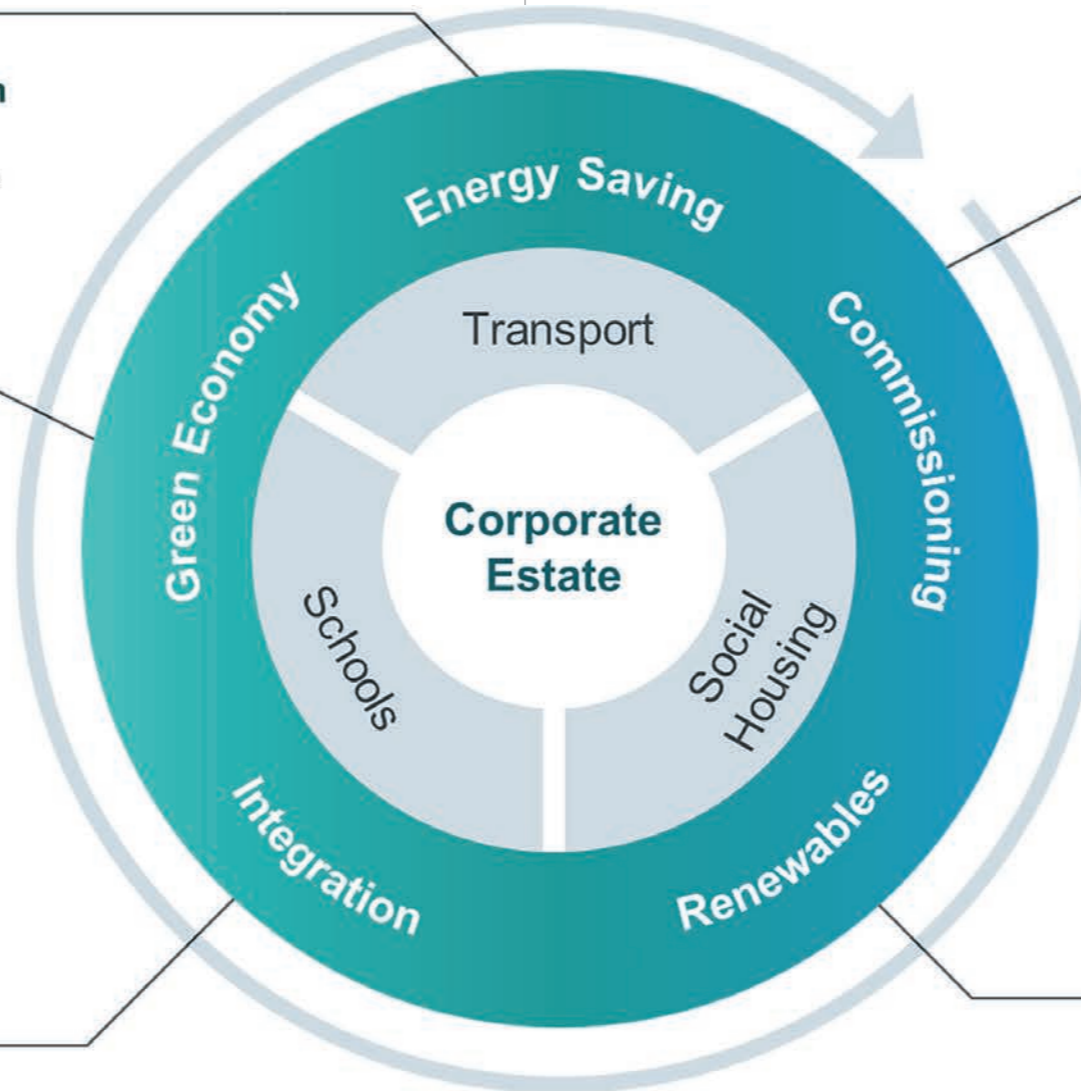
Implement fabric-first energy efficiency measures in buildings, install and optimise intelligent building management controls and reduce road transport journeys

Priority 5 - Position Stoke-on-Trent for green economy opportunities

Connect large-scale heat sources to a widely available DHN and provide Heat-as-a-Service within the region, and consider surplus ERF power for revenue and hydrogen production

Priority 4 - Coordinate and digitalize energy assets and services

Utilise 'Silicon Stoke' network to achieve full visibility and control of energy consumption, spend and emissions, and delivery of energy services



Priority 2 - Establish Joint Venture for SoTCC energy services

'Stoke Energy Co' delivers, operates and manages electricity and heat infrastructure and services, achieving attractive returns at reduced risk

Priority 3 - Become self-sufficient in low carbon energy generation

Continue the deployment of Solar PV and CHP engines, invest in next generation ERF and utilize the region's geothermal and minewater heat potential

Energy priority 1. Reduce the City Council's energy and fuel consumption to cut costs and carbon emissions

Approach

- Use data to identify and prioritise efficiency savings.
- Maximise the use of solar power and LED lighting.
- Make buildings more energy efficient.
- Expand electric vehicles and charging infrastructure.

Key outcomes by 2033

- Energy costs for the City Council outperform the market.
- Carbon and greenhouse gas emissions from the corporate estate and transport fleet reduce to half of 2022 levels.

Energy priority 2. Generate commercial returns on investment in energy infrastructure

Approach

- Establish a local energy company and board.
- Provide low-carbon energy and heat commercially.
- Develop commercial electric vehicle charging services

Key outcomes by 2033

- Stoke-on-Trent Energy Company is established.
- The City Council generates significant additional revenue from energy generation and supply activities.

**Energy priority 3.
Enable the City Council to achieve self-sufficiency in low carbon energy generation**

Approach

- Deliver and expand the District Heat Network (DHN).
- Create the Hanford Energy Recovery Facility (ERF).
- Invest in combined heat and power (CHP) facilities.
- Establish a solar photovoltaic ‘virtual farm’.

Key outcomes by 2033

- Decarbonisation of heat energy supplied to council buildings.
- Decarbonisation of fuel for council vehicles and key provider services.
- More than half of corporate estate buildings are connected to the DHN.

**Energy priority 4.
Use digital transformation and integration to maximise energy efficiency across the City Council**

Approach

- Implement the Silicon Stoke digital transformation plans.
- Install smart building energy management systems.
- Roll out citywide rapid electric vehicle charging network.

Key outcomes by 2033

- The City Council is a national trailblazer for local government green energy transformation.
- The City Council uses SMART connectivity and automation to maximise energy efficiency across its sites and commercial customers’ buildings.

**Energy priority 5.
Create green economic opportunities for Stoke-on-Trent**

Approach

- Use the DHN and ERF projects to boost local skills and jobs.
- Use energy offer to attract businesses to the city.
- Position Stoke-on-Trent as centre of excellence for energy innovation.

Key outcomes by 2033

- The city’s innovative and cost-effective low carbon energy offer sets Stoke-on-Trent apart from other places and becomes a powerful tool for attracting inward investment.

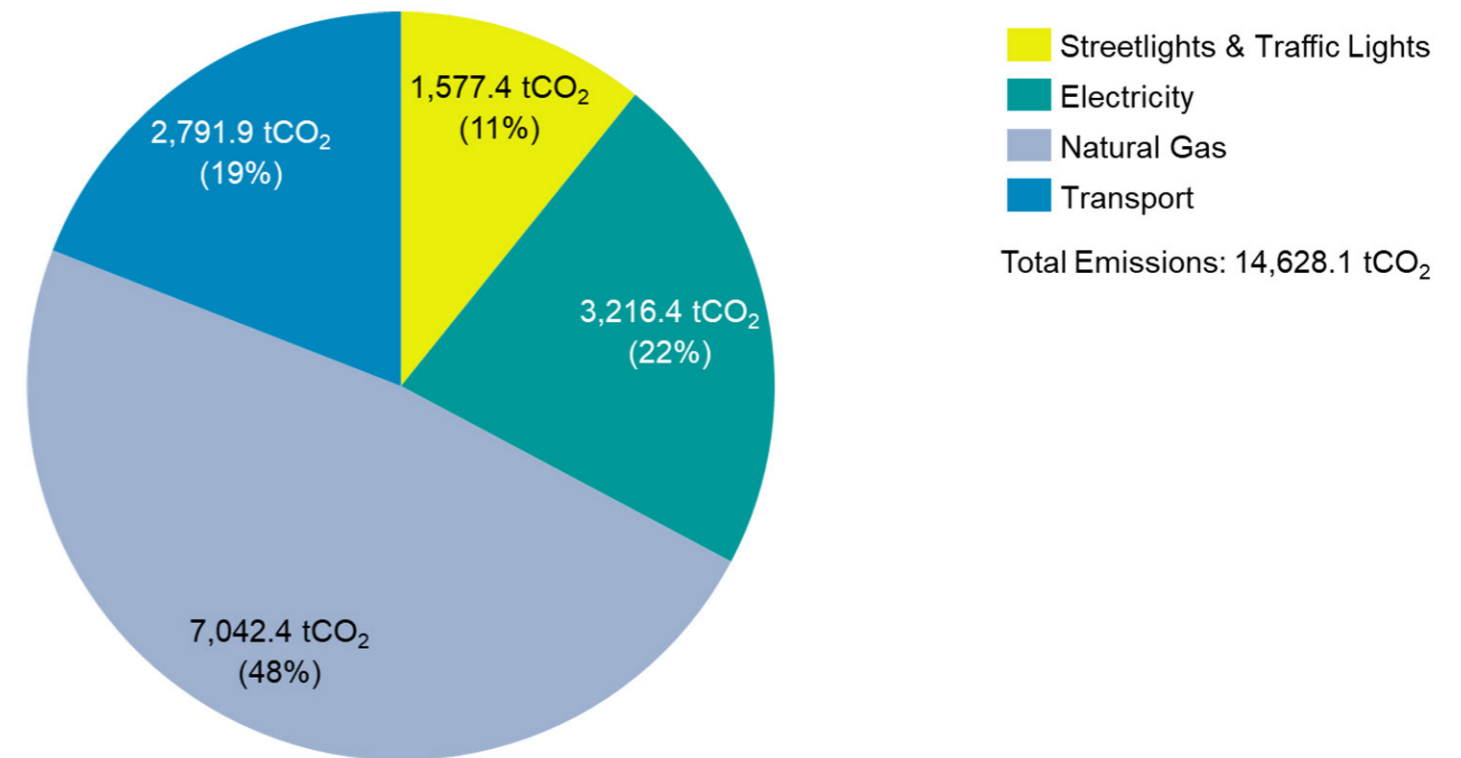
Context - Where we are now

Energy resources

Since 2018, the City Council has managed to reduce its overall energy consumption by one fifth, which has led to:

- A 32 per cent reduction in carbon emissions, preventing the release of the equivalent of 5,540 tonnes of CO2. That is the same as the average emissions produced by 1,500 petrol-powered cars.
- A £1.6 million drop in annual energy costs.

However, the council is currently spending about £12.4 million on energy each year, and this is forecast to increase by up to 50 per cent, to £18.7 million, by 2026 due to changing market conditions. The organisation currently consumes about 94 GWh of electricity and 267 GWh of gas each year, much of which is used by social housing and schools. Only 24 per cent of electricity and 13 per cent of gas is consumed directly by the City Council. The council is also still producing 14,628 tonnes of CO2 each year, half of which stems from the consumption of gas, while a fifth is caused by vehicle emissions.



Opportunities

Energy efficiency

Working with private sector partner Siemens, the City Council has developed an energy decarbonisation investment tool to enable the authority to accurately measure current energy consumption and carbon emission levels across the entire organisation and model scenarios relating to future energy demand. The tool has used data from 2021-22 to create a baseline for the City Council's energy consumption levels. This will not only enable the organisation to monitor changes in consumption, but it will also allow for more detailed examination of how individual buildings and services use energy, which will facilitate more targeted approaches to energy reduction and decarbonisation in future. A number of important opportunities have been identified which are likely to deliver significant reductions over the lifespan of this strategy.

Decarbonisation

This describes all of the activities aimed at reducing carbon emissions arising directly from the City Council's day-to-day activities. Newly-available data has highlighted 32 council buildings which are collectively responsible for 80 per cent of energy consumption and a similar proportion of carbon emissions. The authority will initially focus on 11 priority sites which offer the greatest potential for reducing energy consumption and carbon emissions through the use of some of the approaches outlined below. The key sites are:

- The Civic Centre
- New Horizons Sport & Leisure Centre
- Swann House
- Dimensions Leisure Centre
- Potteries Museum & Art Gallery
- Steel House
- Fenton Manor Leisure Centre
- Smithfield 1
- Smithfield 2
- Stoke Town Hall
- Stoke Library

Energy recovery

As well as reducing the overall amount of energy that the City Council consumes, there are additional potential gains to be secured through investment in energy recovery mechanisms which capture wasted energy and convert it into electrical power and heat. The most promising opportunity relates to the Hanford Energy from Waste plant. This already generates up to 11 MW of electricity via a steam turbine powered by heat from the waste incinerator. However, investment in an Energy Recovery Facility (ERF) has the potential to generate around 320 GWh of electricity and 400 GWh of heat energy - sufficient outputs to meet all of the City Council's needs, and deliver surpluses worth at least an estimated £50 million each year in commercial energy sales.

Electricity generation

The reducing costs associated with solar power, combined with predictable daily outputs, make this an increasingly attractive option for large-scale electricity generation over the next decade. Opportunities exist to use council buildings and land for the installation of solar photovoltaic cells. The use of combined heat and power (CHP) facilities also provides potential opportunities to convert heat which is currently emitted as a by-product of other processes and convert it into electrical power.

Renewable heat energy

Alongside the Hanford ERF proposal, there are also opportunities to harness other sources of heat energy and use these to supply cost-effective, low-carbon heat energy to homes and businesses via the city's expanding District Heat Network. Geothermal heat energy from underground sources offers a sustainable and decarbonised source of energy, as an alternative to gas consumption, which can be used to boost heat output over an expanded network. There are also potential opportunities in relation to harvesting waste heat energy from industrial processes, such as the operation of pottery kilns and furnaces. While the initial goal of this strategy is focused on meeting the energy demands of the City Council's corporate estate and achieving self-sufficiency in low carbon energy supply, there are also significant opportunities for decarbonisation in relation to the city's social housing estate (around 18,000 properties), schools (98 sites) and the potential inclusion of public and private sector commercial customers.

Transport electrification

The City Council currently operates no electric vehicles within its own fleet, and has no charging infrastructure to enable its staff or the general public to charge vehicles. The authority spent £7.77 million on transport fuels in 2022-23, and this figure is forecast to rise to £9.33 million by 2026. Investment in electric vehicles and infrastructure can deliver significant direct savings and potentially generate commercial income from on-street charging.

Digital integration

The City Council's Silicon Stoke programme aims to use the city's advanced digital connectivity to enable the introduction of SMART technology, including digitally connected energy systems and networks. A digital energy system for the council would be data-driven and would use a centralised control mechanism to manage energy outputs and divert surplus power between sites, or to the National Grid, to maximise efficiency and commercial returns. The system would use the citywide full-fibre, gigabit-enabled network that was laid in conjunction with the installation of the District Heat Network pipelines.

Commercial joint venture

The City Council is working towards the establishment of a joint venture with a commercial partner to supply surplus energy which is generated in the city to commercial customers and the National Grid. The resulting arms-length company would also coordinate investment in, and delivery of, energy infrastructure to maximise outputs and returns and capitalise on the city's increasing energy independence.

Challenges

Financial

Like many local authorities, Stoke-on-Trent City Council is grappling with inflationary and other cost pressures, and struggling to maintain the quality and accessibility of local services in the face of growing demand and economic uncertainty. Delivering all of the proposed actions contained in this strategy would involve very significant capital investment at a time when councils are dealing with significant financial sustainability challenges. However, the potential financial rewards of securing this investment would be transformative, delivering not only energy self-sufficiency for the City Council, but also the possibility of tens of millions of pounds in income from the commercial sale of surplus low-carbon energy to paying customers and the national energy networks. In addition to the reward element, there is also a penalty risk in that failure to reduce energy consumption is forecast to result in a 50 per cent increase in the City Council's energy bills (from £12.4 million to £18.7 million) by 2026. Without a proportionate increase in revenue, such cost increases would be likely to have a catastrophic impact on the authority's financial sustainability and its ability to deliver vital services to Stoke-on-Trent's 254,000 inhabitants.

Table - Current energy demand, carbon emission levels and financial costs for the City Council

	Electrical		Natural Gas / Thermal		Transport Fuels		Total
	GWh _e	tCO ₂	GWh _e	tCO ₂	GWh _e	tCO ₂	tCO ₂
Corporate Energy Consumption	22.577	4,794	34.697	7,042	11.171	2,792	14,628
Corporate Utility Bills (present)	£3.725M		£0.867M		£7.775M		£12.369M
Corporate Utility Bills (projected 2025 - 26)	£6.434M		£2.949M		£9.331M ³		£18.714M

National policy

The UK Government has enshrined in law a binding commitment to achieve net zero for carbon and greenhouse gas emissions by 2050, and to achieve 75 per cent of this reduction by 2037. The Climate Change Act commits the whole public sector to achieving these targets, including local government. However, there is currently little indication that the scale of ambition will be reflected in government funding decisions or in the broader, day-to-day policy agenda. Upholding local government's share of the national climate change commitment is therefore likely to rely on the dedication and resourcefulness of individual councils to meet this challenge in the face of competing priorities and pressures over the next 27 years.

Geo-political

The ongoing conflict in Ukraine has had a profound effect on energy prices globally. In the UK, gas prices soared by almost 130 per cent in the year to October 2022, while electricity prices rose by more than 65 per cent, with both continuing to increase at these rates for a period of six months. The resulting increase in inflation caused national economic turbulence and exposed millions of families and businesses to immense financial strains. Central and local government were forced to take urgent steps to protect vulnerable and at-risk households during the winter period, and are currently assessing whether further interventions will be required in autumn 2023. The Government has acknowledged that recent events have highlighted the need to strengthen the UK's energy security and move towards greater self-sufficiency through investment in low-carbon domestic energy generation and storage, as well as boosting energy efficiency. Local government faces the same challenges if councils, and the communities which they serve, are to be able to withstand future energy price shocks.

Social

While fuel poverty and social deprivation do not represent direct challenges to the successful implementation of the actions contained in this strategy, it is important to understand that low levels of household income and home ownership pose significant barriers to broader, citywide approaches to improving energy efficiency and alleviating fuel poverty. One of the longer-term ambitions which is likely to arise from the delivery of this strategy would involve investment in the city's social housing stock of almost 18,000 properties. Although it is not a direct objective of this strategy, it is clear that successfully reducing energy consumption linked to council housing, and the resulting costs to tenants, would be likely to have a measurable impact on the prevalence of fuel poverty and related forms of hardship across the city's population as a whole.

Scale and influence

Stoke-on-Trent City Council's asset register lists 19,285 assets – each of which will ultimately require investment to improve energy efficiency and reduce consumption and emissions. This Energy Strategy's primary focus is on the 245 buildings in the City Council's ownership over which it can exercise full control, along with the 674 vehicles which comprise the authority's transport fleet. In addition, there are 34,261 streetlights and 2,881 illuminated signs around the city which contribute to the council's energy overheads and can play a significant part in reducing overall consumption. Some of the actions and approaches set out in this strategy have the potential to deliver significantly improved outcomes for stakeholders across the wider city. However, while this strategy may help to create the conditions for broader interventions, this is not the immediate focus of the City Council's energy reduction and decarbonisation efforts.

Political and organisational buy-in

This strategy outlines a wide range of policy approaches aimed at reducing energy costs for the City Council and cutting carbon and greenhouse gas emissions in line with the binding net zero target which was set out within the UK Climate Change Act. Achieving the core objectives underpinning this strategy will require significant long-term investment and a coordinated whole-council commitment to delivery over a timeframe spanning more than 25 years – a period that will cover the next seven council administrations.

Policy context

Although this is a strategy developed by, and for, Stoke-on-Trent City Council, there are a number of national policies which can be considered relevant to the strategy's aims and objectives. As a public body, the City Council is regarded as having a duty to comply with active legislation and binding government targets in relation to climate change and carbon reduction. Details of these are set out below:

The Climate Change Act, 2008 (amended in 2019)

The 2008 UK Climate Change Act is the primary legislation which underpins national policy on climate change in the UK. Crucially, as well as providing a comprehensive framework for addressing and adapting to key impacts of climate change, the Act was amended in 2019 to include a legally binding commitment to achieve net-zero carbon emissions across the whole of government by 2050, as well as reducing them by at least 78 per cent of 1990 levels by 2035. This commitment is one of the four central pillars of the Act, along with:

- The introduction of 'carbon budget' to provide five-year milestones towards achieving net zero;
- A requirement for the Government to develop and publish policy programmes to achieve the required reductions in emissions and address identified climate risks;
- The creation of the Climate Change Committee as an independent advisory and monitoring body comprising a panel of impartial experts on climate change mitigation and adaptation.

The Clean Growth Strategy (2017)

The Government recognised that the Climate Change Act created potential opportunities in relation to strengthening the UK's green economy in order to make the successful transition to net-zero. The low-carbon economy was forecast to grow at four times the pace of the conventional economy by 2030. The strategy set out a comprehensive set of policies and proposals that aimed to accelerate the pace of this 'clean growth' and ensure that the UK achieved all of its carbon budget targets. It also paved the way for the creation of the National Productivity Investment Fund to enable £4.7 billion of investment in low carbon innovation. Key elements of the strategy included:

- Creating new investment and financial management models to incentivise and facilitate carbon reduction.
- Developing a package of measures to support businesses to improve their energy productivity by at least 20 per cent by 2030, including supporting the recycling of heat used in industrial processes.
- Improving the energy efficiency of homes (to EPC band C) by 2035.
- Phasing out the installation of natural gas boilers beyond 2035.
- Investing in low carbon heating systems, including heat networks.
- Cutting UK transport emissions by 24 per cent by abolishing the sale of new petrol and diesel cars and vans by 2040 (since amended to 2030) and investing in a world-leading national electric vehicle charging network, with the public sector taking the lead in transitioning to electric vehicles.
- Implementing smart energy systems to enhance efficiency and flexibility.
- Introducing a voluntary public sector target for carbon reduction (30 per cent by 2021).

The Environment Act (2021)

The Act aimed to strengthen a range of environmental protections by enshrining them into law, including new measures relating to nature protection, water quality and clean air. It also enabled the Government to set new and binding targets in areas such as air and water quality, litter enforcement, biodiversity, and waste reduction. It set out the legal framework for significant reforms to local authority waste and recycling services, as well as creating new statutory duties for local authorities on nature recovery.

Build Back Greener strategy (2021)

This was developed as one of the key strategies underpinning the Climate Change Act. It set out pathways and sector-specific policies and proposals designed to achieve the Government's binding 2050 net zero target. It set out plans for reducing emissions from each sector of the economy, as well as removing existing carbon and greenhouse gas emissions from the environment. Proposals in the strategy included:

- Decarbonising power generation by 2035 through a shift to nuclear and renewable energy.
- Investing in the supply of cleaner fuels, such as hydrogen.
- Supporting industry to cut energy consumption, capture carbon and switch to cleaner power sources.
- Phasing out gas boilers and introducing low carbon heating systems, such as heat pumps.
- Reducing emissions from public sector buildings by 75 per cent by 2037.
- Supporting the transition to zero-emission vehicles .
- Investing in sustainable public and local transport systems.

Heat and Buildings Strategy (2021)

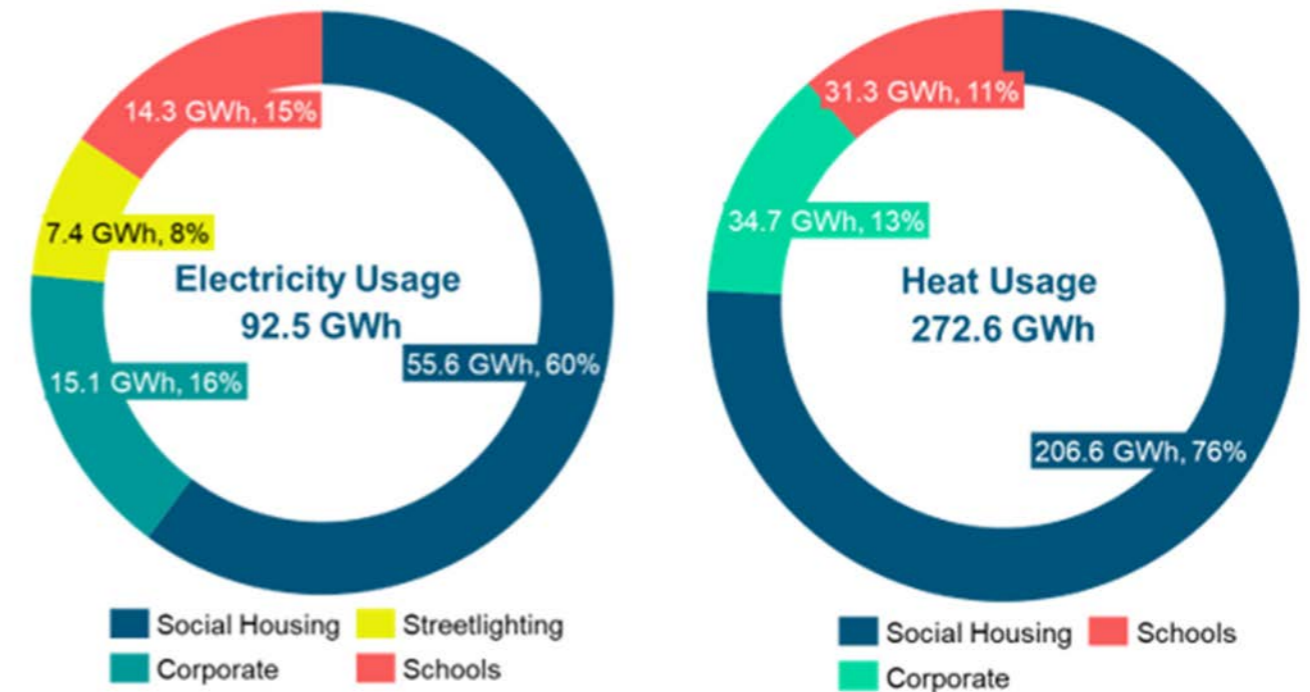
This strategy set out how the UK would decarbonise homes and commercial, industrial and public sector buildings as part of the commitment to achieving net zero by 2050. Areas of focus in the strategy included:

- Developing the market and reducing costs for the supply of energy efficient low-carbon heat, including via heat networks.
- Installing measures to improve the energy efficiency of buildings and ensure long-term compatibility with low-carbon heating systems.
- Creating smart and flexible energy systems to maximise efficiency and reduce costs.



Maximising the energy output from the Hanford ERF will also be dependent on securing sufficient waste for incineration – a factor which has limited the performance of the existing facility during its lifetime. The diagrams below show how the energy outputs from the redeveloped ERF could meet all of the City Council’s forecast energy needs, leaving an estimated 227.5 GWh of surplus electricity and 127.4 GWh of heat energy for potential export to generate income. By offsetting the City Council’s current utility power and gas consumption, the ERF project could reduce expenditure by up to £8.4 million per year and cut direct CO2 emissions by 13,335 tonnes.

Hanford ERF – forecast energy generation and demand:



Key projects

1 – Hanford Energy Recovery Facility

Stoke-on-Trent City Council has operated the energy-from-waste (EFW) facility at Hanford for over 30 years, preventing thousands of tonnes of waste from entering landfill each year. The incinerator uses specialist boilers to generate an average energy output equivalent to 11MW. However, the facility is approaching the end of its planned lifespan and is due for replacement in the next decade. This presents an opportunity to redevelop the incinerator into a more efficient energy generation facility. Redevelopment of Hanford into an Energy Recovery Facility would vastly increase its potential power output, while further upgrades connecting the ERF site to the District Heat Network and installing carbon capture technology could transform the City Council from a major consumer of gas and electricity into a fully self-sufficient net supplier of surplus zero-carbon energy to the commercial marketplace.



2 – District Heat Network (DHN)

The District Heat Network is a multi-phase project to create the UK’s largest local heat network to supply up to 45GWh of renewable, low-carbon heat energy to properties connected to an 18km-long pipeline. Water in the pipeline will be heated by a range of heat sources, including deep geothermal heat from 3km below the ground, as well as combined heat and power (CHP) systems, and potentially by the heat from the Hanford ERF. The first 5km phase of pipeline has already been installed around the city’s University Quarter and will be heated by a gas-fired CHP system. When complete, the network will connect to the Hanford ERF site and serve commercial units at Festival Park, near the City Centre.

In the longer term, the City Council aims to use deep geothermal heat for the District Heat Network. Extensive geotechnical investigations have indicated that geothermal hot water is located approximately three kilometres below the ground on which Stoke-on-Trent lies. The underground water is thought to be heated to at least 95 degrees Celsius. The City Council has also worked with European experts on geothermal heat networks to develop effective approaches for accessing and extracting the hot water and using it to heat the water which is conveyed through the District Heat Network.



1. DHN heat exchanger with low carbon heat source
2. Backup/Peak boiler
3. DHN circulation pump
4. DHN infrastructure
5. DHN/Building heat exchanger
6. Building internal heating system

— Hot water flow
— Cold water return



3 – Solar Photovoltaic (PV)

The declining costs and improving efficiency and predictability of solar PV systems are making them an increasingly attractive option for councils and other buyers looking to reduce energy consumption, costs and emissions. The City Council is therefore aiming to pursue the generation of electricity using solar PV systems at scale as a core part of its decarbonisation approach. Panels can be mounted on rooftops or on open spaces as ‘solar farm’ arrays. Potential total electricity generation is up to 3.5 MW from rooftop systems and 30 MW from ground-mounted systems.

The City Council delivered a limited solar PV project during 2021-22, which involved almost £835,000 of investment in the installation of solar PV systems on three council-owned sites. The systems, which had a peak generation rate of 582 kWh, delivered a total reduction in utility power consumption of 433,624 kWh in 10 months, saving the authority more than £60,000 in energy costs and reducing carbon emissions by the equivalent of 32 tonnes per year.

4 – Combined Heat and Power (CHP)

Combined heat and power systems are highly energy efficient engines which not only generate electricity, but also capture the heat energy that is generated as a by-product of the electrical generation process. By generating heat and power simultaneously, CHP can reduce carbon emissions by up to 30 per cent compared to using a conventional boiler and utility electricity supply, as well as cutting energy costs by around 20 per cent. This dual advantage makes CHP one of the most important steps on the journey to full energy decarbonisation. Its potential universal application is only limited by the fact that CHP technology currently relies on fossil fuel. However, subsequent generations of CHP engines are expected to run on a blend of ‘green’ hydrogen (i.e. from renewable, carbon-neutral sources) and natural gas, which will transform their potential role in the reduction of carbon and greenhouse gas emissions from energy generation.

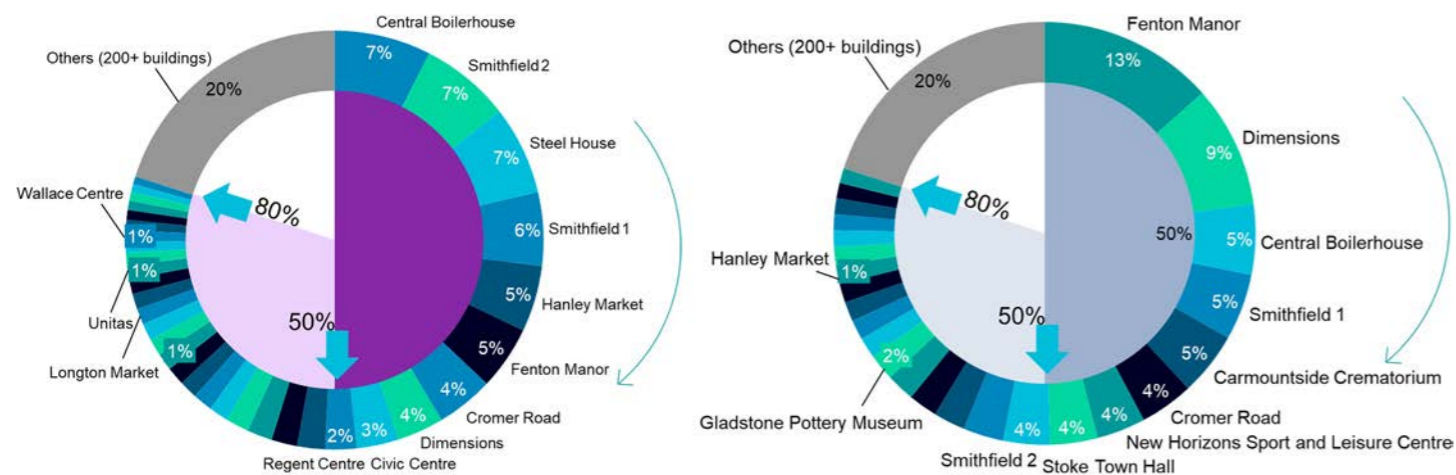
5 – Digitalisation and energy management

The City Council’s energy decarbonisation investment tool is demonstrating the power of accurate and timely data in terms of understanding and addressing energy efficiency and carbon reduction. This data visibility highlights where investment should be focused in order to achieve the greatest improvement in outcomes. In order to maximise the benefits of investment, the City Council will need to explore the potential impact of digital transformation to develop smart, flexible systems of centralised energy management, both for individual council assets and the corporate estate as a whole.

Digital energy management will enable the City Council to:

- Pull together data from a large number of energy assets to build up a clear picture of energy consumption and demand, as well as the potential for reductions through improved insulation or alternative methods of energy generation. This can be used to inform more coordinated approaches to energy reduction and decarbonisation across the organisation;
- Develop centralised mechanisms to control energy generation, transfer and storage across the corporate estate to maximise efficiency and respond to changes in demand flexibly;
- Monitor the impact and effectiveness of energy reduction measures in real time.

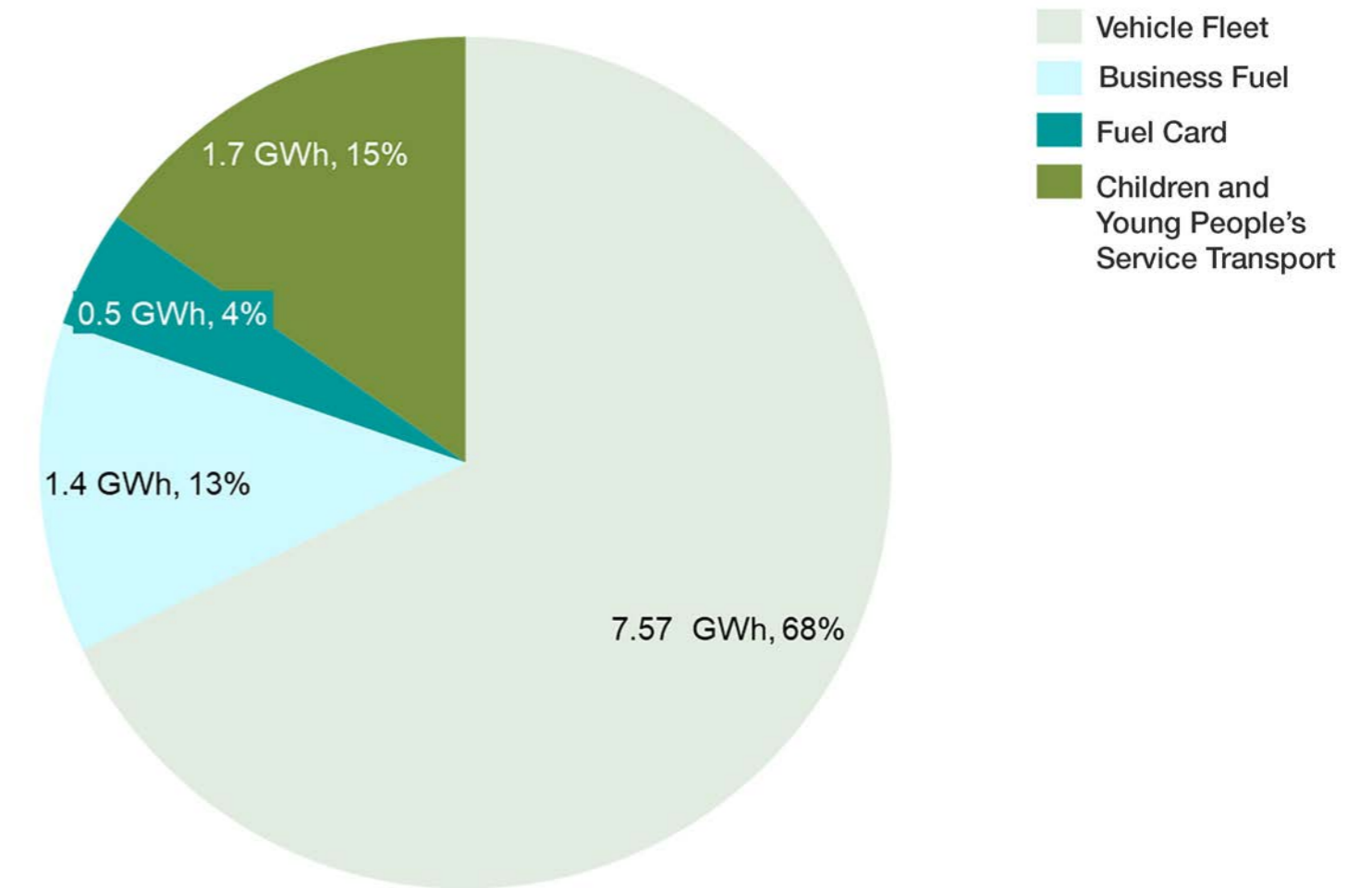
Electrical and heat energy consumption rates of key council buildings



6 – Decarbonising the council’s transport fleet

The City Council’s road transport fleet is currently responsible for 7.57GWh of energy consumption from burning fossil fuels in vehicle engines. As well as emitting significant quantities of CO₂, this is also contributing to air quality problems in the city. Analysis has shown that a small number of the council’s vehicles are responsible for a disproportionately high level of emissions and consumption. The Government has committed the UK to ending the sale of new petrol and diesel cars and vans by 2030, and there is an expectation that all vehicles will need to become ultra-low emission vehicles (ULEVs) by 2050 in order to meet the Climate Change Act decarbonisation target.

In addition to electrifying its transport fleet or converting them to ULEVs, and installing the necessary infrastructure to enable charging at key transport sites and depots, an opportunity also exists to facilitate access to charging for key council staff who use their private vehicles for carrying out official council duties. These staff currently either use corporate fuel cards to purchase petrol or diesel for their own vehicles or claim an allowance for business mileage.



Governance

Delivery of the Stoke-on-Trent City Council Energy Strategy will initially be undertaken by the Cabinet Member and senior council officers working within the Housing, Development and Growth directorate. However, ultimately delivery is expected to be overseen by a management board consisting of Elected Members of the City Council, local authority officers and representatives from the council's commercial joint enterprise partner. The exact composition of the board and its terms of reference, remit and budget will be decided by the City Council at the appropriate time. Any proposal regarding the establishment of the energy board will be subject to approval by the council's Cabinet and subsequent ratification by the full City Council.

Potential steps relating to the establishment of effective governance arrangements include:

- Establishing a stakeholder engagement model underpinned by a clarification and strengthening of the energy role of Elected Members.
- Establishing a council-controlled joint venture to facilitate energy generation and supply, the delivery of services including installation, and the management of revenues from commercial activities.
- Strengthening and clarifying the role of Overview and Scrutiny Committees in relation to the energy and carbon agenda and the delivery of key programmes of work from this strategy.
- Reviewing existing City Council policies and strategies to identify and enhance their contribution to energy strategy targets and outcomes.
- Strengthening the emphasis on energy and decarbonisation in the City Council's Operational Framework and establishing clear SMART performance targets through a dedicated budget with carbon accounting.
- Reviewing the City Council's Scheme of Delegation and job descriptions to reflect responsibilities relating to energy and decarbonisation.
- Ensuring that Cabinet reports consider the energy and carbon implications of key decisions, and developing appropriate supporting guidance for officers and members.
- Designing and delivering dedicated training programmes for Elected Members and key officers in order to build competencies and capacity around the energy and carbon agenda.

Monitoring and reporting against delivery

The City Council's decarbonisation investment tool will enable access to detailed data on energy consumption and carbon and greenhouse gas emission levels. These data will provide the basis for performance monitoring in relation to the delivery of the City Council Energy Strategy. Annual reporting against the strategy will highlight the progress made on the 2018-19 baseline data and the impacts of specific activities and approaches in the context of the strategy's aims and objectives.



Fenton Manor airsource heat pump system
Image courtesy of Siemens

Action plan (2023-2033)

Priority

Actions

	Next 2 years	Next 5 years	Next 10 years
Reduce the City Council's energy and fuel consumption to cut costs and carbon emissions.	<ul style="list-style-type: none"> Analyse energy consumption data for corporate estate and transport to identify targets for energy reduction Conduct efficiency upgrade studies on council buildings Complete the existing LED streetlight conversion project Pilot the installation of solar-powered CCTV systems at strategic locations in the city 	<ul style="list-style-type: none"> Install efficiency measures to council buildings prioritised for their consumption levels and/or ease of upgrading Convert council-owned illuminated signs to LEDs Electrify the council's small vehicle fleet Introduce a subsidised home charging scheme for council employees who use electric vehicles for work-related travel 	<ul style="list-style-type: none"> Complete the connection to the District Heat Network for all corporate buildings which can feasibly be added to the network Undertake preparatory work in relation to connecting social housing to the District Heat Network Convert all larger vehicles in the corporate transport fleet to ultra-low emission vehicles (ULEV)
Generate commercial returns on investment in energy infrastructure.	<ul style="list-style-type: none"> Establish a local energy company as a joint venture with a private sector partner Establish an 'energy board' to coordinate investment in energy infrastructure and oversee energy efficiency and decarbonisation efforts 	<ul style="list-style-type: none"> Enable the energy company to take on low-carbon energy technology installation and operating capabilities and assets Offer commercial electric vehicle charging services in council-owned car parks and other publicly accessible sites 	<ul style="list-style-type: none"> Offer heat energy to public and private sector customers, including schools and social housing tenants Complete the citywide installation of on-street electric vehicle charging infrastructure, making use of existing streetlighting and digital infrastructure
Enable the City Council to achieve self-sufficiency in low carbon energy generation.	<ul style="list-style-type: none"> Install solar PV and CHP systems at appropriate locations across the corporate estate Undertake the initial refurbishment phase of the Hanford ERF redevelopment proposals Expand the District Heat Network to enable more council-owned sites to benefit from the supply of low-carbon heat 	<ul style="list-style-type: none"> Continue to install solar PV systems on appropriate council-owned/managed sites Progress the proposed redevelopment of the Hanford ERF site Continue to expand the District Heat Network to extend connectivity and services to more of the corporate estate 	<ul style="list-style-type: none"> Complete the installation of a centrally managed solar PV 'virtual farm' across elements of the corporate estate Commence construction of the second phase of the Hanford ERF redevelopment to allow for carbon capture and potential green hydrogen generation Explore potential opportunities in relation to the wider use of carbon capture and storage methods
Use digital transformation to maximise energy efficiency across the City Council.	<ul style="list-style-type: none"> Deliver the relevant aspects of the Silicon Stoke programme to facilitate future developments around smart approaches to energy management Explore opportunities for the installation of EV charging infrastructure for City Council use 	<ul style="list-style-type: none"> Establish remote energy monitoring and management systems using the Silicon Stoke programme's digital infrastructure and high-speed connectivity Make the transition to cloud-based IT applications for digital energy management systems 	<ul style="list-style-type: none"> Complete the delivery of the expanded District Heat Network Capitalise on Silicon Stoke digital infrastructure to unlock further advances in 'smart city' energy management solutions
Create green economic opportunities for Stoke-on-Trent.	<ul style="list-style-type: none"> Evaluate potential opportunities and demand regarding commercial customers connecting to the District Heat Network 	<ul style="list-style-type: none"> Use Hanford ERF, solar PV and electric vehicle infrastructure procurement and delivery programmes to generate additional employment and training opportunities for city residents 	<ul style="list-style-type: none"> Explore how the creation of a carbon pricing model for the city could help to support the development of further decarbonisation programmes



City of

Stoke-on-Trent