



Edinburgh Adapts Our Vision

2016→2050

Edinburgh Adapts: Our Vision

Edinburgh Adapts aims to help our city adapt to the challenges of our changing climate. Our vision is for an Edinburgh that considers climate risks and opportunities at all levels of decision making, works with the grain of our valuable natural systems, is resilient to the shocks of extreme weather, and where citizens live healthy, happy, lives safe from the unavoidable impacts of climate change.



THE EDINBURGH PARTNERSHIP

The Edinburgh Partnership is the community planning partnership for Edinburgh.

www.sustainableedinburgh.org

Adaptation Scotland

supporting climate change resilience

Developing this vision for Edinburgh has been supported through the Adaptation Scotland programme.

Adaptation Scotland is a programme funded by the Scottish Government and delivered by Sniffer.

www.adaptationscotland.org.uk



Sniffer is a registered charity delivering knowledge based solutions to resilience and sustainability issues.

www.sniffer.org.uk

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Introduction

Scotland's climate is changing and the impacts on Edinburgh are already being felt: average temperatures are rising and heavy downpours are becoming more frequent. The city has many initiatives in process to reduce our carbon emissions, helping in the global fight against climate change. However, while working to reduce our carbon footprint and our impact on the planet, our city must also prepare for the unavoidable impacts of climate change.

Edinburgh is Scotland's capital and our country's second most populous city. Our Old and New Towns are jointly listed as an UNESCO World Heritage Site, we have some of the best and most expansive city centre greenspace in the world, we are a global centre for learning, we host the biggest annual international arts festival in the world, we are the second largest financial and administrative centre in the UK, and the second most popular tourist destination. To protect this proud heritage, it is essential that we adapt our city in order to minimise the social, economic and environmental impacts of climate change.

Our Vision for a Climate Ready Edinburgh is one in which we work in partnership to take early action to prepare for the challenges we will face in the future. No one organisation, community, business or individual will be able to adapt to climate change alone, so adaptation provides a unique opportunity for our city, and all those who call it home, to work together on the common goals of securing safety and prosperity for all.

The decisions and investments we make today will determine how we live with climate change in years to come. This Vision was created by representatives from organisations across the city, giving voice to our collective hopes for the future and creating a picture of the results of the adaptation actions listed in the Edinburgh Adapts Action Plan. The Vision and Action Plan are a starting point on our adaptation journey, a journey with many different possible goals and paths to take. To help shape the climate ready Edinburgh you want to see, we invite you to join the conversation.

“The Vision and Action Plan are a starting point on our adaptation journey, a journey with many different possible goals and paths to take.”

The challenge

Rain, sun, wind, snow and hail – and that’s just on an average Tuesday – Edinburgh is well-used to changes in the weather. Whether out catching rays in the Meadows or wrapped in a blanket watching fireworks crown Calton Hill, Edinburgh is not a place to let a little thing like the opening of the heavens to put a damper on its spirit. However, just as the barometer can swing wildly on any given day, significant changes are now being recorded in long-term local weather patterns due to climate change and these will have far-reaching consequences on the way the city functions.

Research shows Scotland’s climate is changing. Over the last few decades it has become warmer and wetter, with an increase in both total rainfall (especially in winter) and the occurrence of heavy rainfall events. As the projections in Fig 1. show, summers in Edinburgh will continue to become warmer and drier, while winters become milder and wetter. The following changes to local conditions can be expected:

- Average temperatures will increase in all seasons (**H**), with the greatest increase in summer (**M**)
- What is considered a heatwave or extremely hot summer today will occur more frequently in future (**M**).
- Rainfall is projected to become more seasonal, with an increase in average winter and autumn rainfall (**M**). Average summer rainfall may decrease (**L**).
- Heavy rainfall events may occur more frequently in winter, spring, and autumn (**M**). An increase in summer heavy rainfall events is uncertain (**L**)
- Snow is projected to be less frequent in coastal locations like Edinburgh with rising temperatures (**H**), although by how much is complicated by increased winter precipitation (**L**).
- The growing season will continue to lengthen due to increasing temperatures in spring and autumn (**H**).
- Winter storms with extreme rainfall may become more frequent (**L**), although there is large uncertainty in models.
- Sea level will rise (**H**).

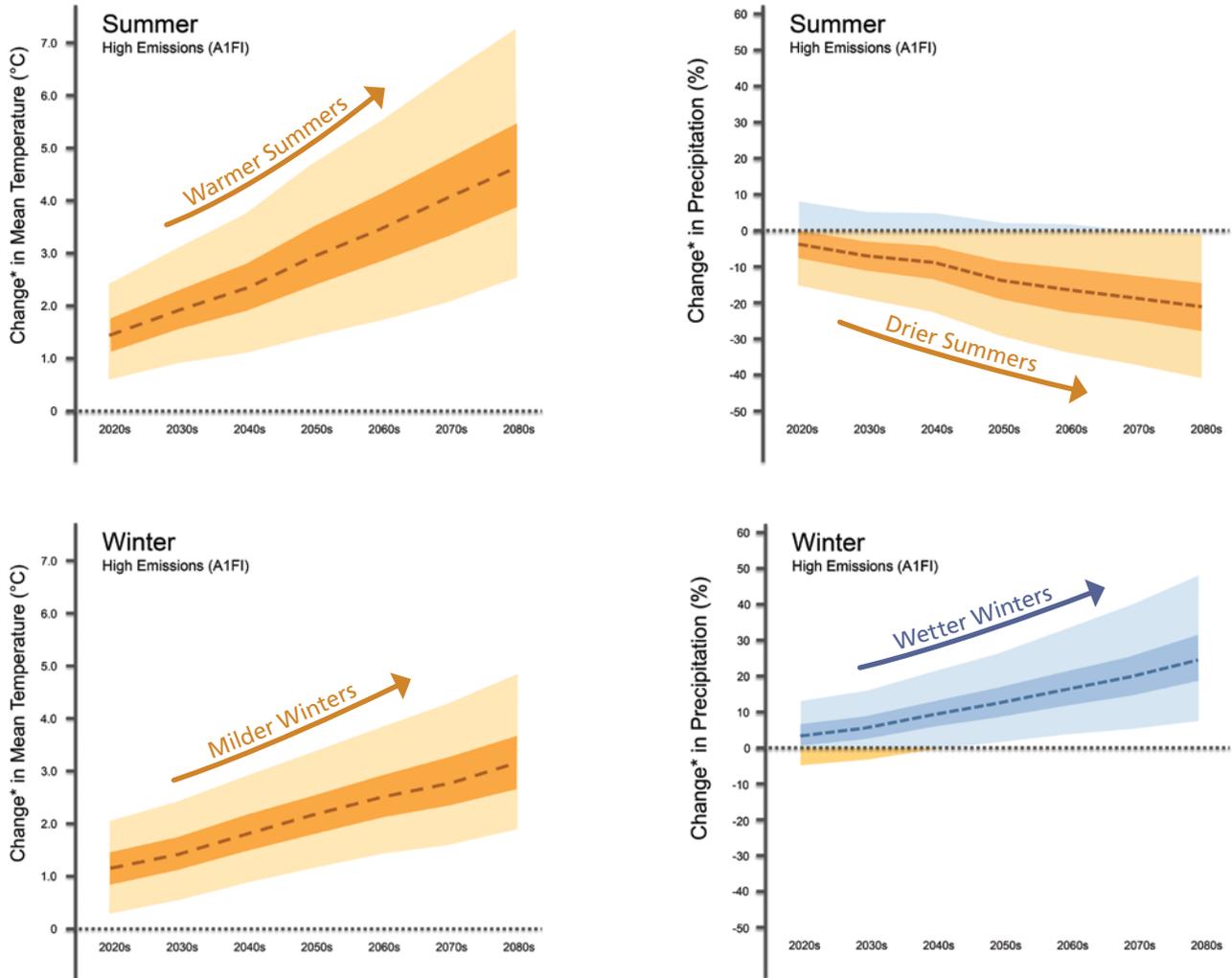


Figure 1: UKCP09 climate projections for Edinburgh (cell 806) showing expected change in mean temperature and mean precipitation for the 21st century. The dashed line is 50% central estimate, the inner band is the likely probability range and the outer band is the very likely probability range (i.e. it is very likely that temperature or rainfall will be within this range). Note all values compared to 1961-1990 baseline average.

*compare to 1961-1990 baseline location = Edinburgh (cell 806)



The final impact of climate change on Edinburgh will vary depending on the success of global mitigation efforts, but even a relatively modest increase in temperature is likely to bring significant changes.

1. Warmer, drier summers

A little less rain might sound quite appealing when huddled under a bus shelter in mid-July, but hotter, drier days bring their own challenges and running out of factor fifty is only the first.

While more sunny days may encourage people to enjoy the outdoors, overheating can pose serious risks to vulnerable people and buildings. As well as getting hotter, these trends suggest summers will become drier, reducing the amount of water that can be captured from precipitation.

“ A little less rain might sound quite appealing when huddled under a bus shelter in mid-July ... but hotter, drier days bring their own challenges. ”

2. Milder, wetter winters

Edinburgh is not a place to let long, dark winter nights go unanswered. Whether it's toasting the bells in Princes Street Gardens or lighting up the night with a dance of fireworks, we take what the winter has in store for us and make the best of it.

Winter in our city is projected to become milder and wetter. One of the most immediate impacts of greater levels of rainfall is the increased risk of flooding, but more precipitation can also lead to more subtle impacts such as increased weathering of our many historic structures.

3. Greater frequency and intensity of heavy rainfall events

Our city is a place where bins regularly chew on broken umbrellas and gale gusts hide behind corners waiting to spring their ambush on the unprepared.

Heavy rain, and other extreme weather events, can lead to flooding, disruption of essential services and damage to infrastructure and buildings. No-one can stop the rain from falling, but our city can take steps to ensure we are prepared for these downpours and the consequences they can have.

“ Even on the most conservative estimates, climate projections show sea levels around our city are likely to rise. While this will be a gradual process, decisions will have to be made as to how we manage this new risk from the sea. ”

4. Rising sea levels

Many of us like to enjoy the sand under our feet on Portobello Beach but as the sailors who have passed through the port of Leith know the sea can be a tricky beastie.

Luckily in Edinburgh coastal flooding has not been a significant issue up to now. However, even on the most conservative estimates, climate projections show sea levels around our city are likely to rise. While this will be a gradual process, decisions will have to be made as to how we manage this new risk from the sea.

Our Vision for a climate ready Edinburgh

GOVERNANCE

→ By 2025...

It's been ten years since businesses, communities and organisations across the city, came together to develop Edinburgh's first adaptation action plan and the benefits are clear to see. The combining of new research on local climate impacts with social and economic indicators has allowed resources to be targeted at areas most at risk, ensuring those most vulnerable are protected from the immediate results of climate change. Adaptation projects have contributed to transformational change, reducing inequality and empowering communities. By training staff in adaptation principles, organisations across the city now give consideration to climate resilience at all stages of their strategic planning, ensuring they are not caught out by changing conditions.

The Edinburgh Adapts Steering Group continues to champion adaptation in the city by facilitating the exchange of ideas among an expanding group of key stakeholders, supporting new partnerships and galvanising support for the adaptation agenda among city leaders. As the city continues to change, a clear communication strategy helps the public understand the reasons and benefits of adaptation improvements. Good monitoring and evaluation has created an impressive bank of practical case studies and demonstration projects. These successes are drawing the attention of the international adaptation community, opening up further funding opportunities and showcasing Edinburgh as a pioneer of climate resilience.

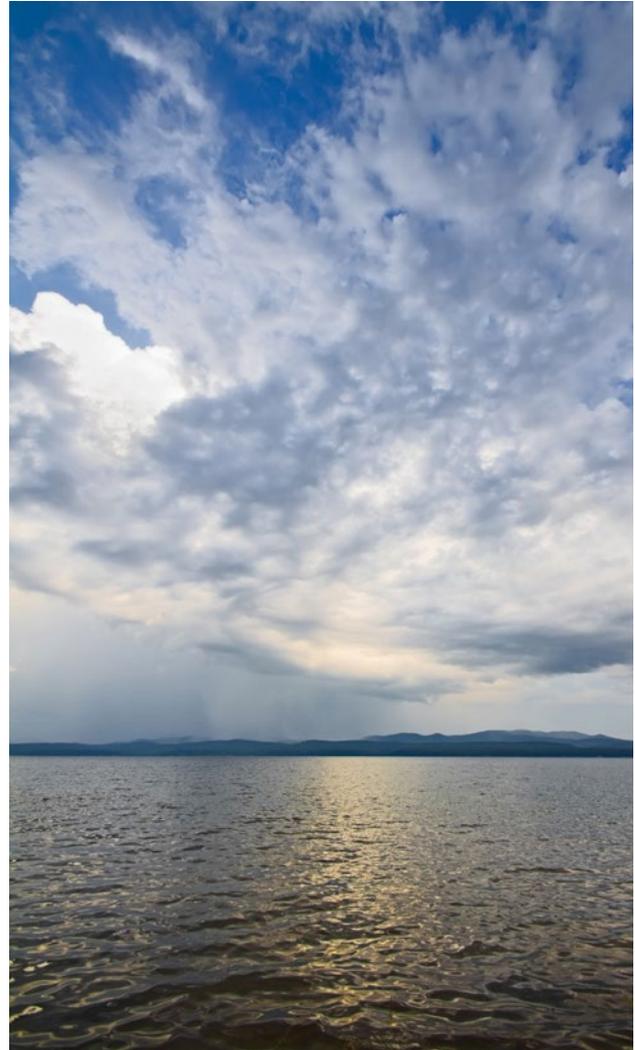
“By 2025, successes are drawing the attention of the international adaptation community, opening up further funding opportunities and showcasing Edinburgh as a pioneer of climate resilience.”

→ By 2050...

Empowered communities, responsible businesses and public sector organisations are continuing to work together in trust and partnership to shape how the city develops. As Edinburgh faces new challenges and opportunities, all parties collaborate to make sure climate resilience is taken into account in city plans, policies and investment decisions.

An engaged population is kept informed of risks such as heatwaves and severe weather through a flexible communications strategy, with neighbourhood networks helping emergency services to put well designed contingency plans into action.

A significant bank of practical case studies on urban climate change impacts, built up over years of robust data gathering and research, allows Edinburgh to act as a knowledge hub for similar cities. The capital is staying ahead of the curve, with a reputation as an adaptation champion, continuing to attract talented thinkers, fresh investment and international recognition.



NATURAL ENVIRONMENT AND GREENSPACE

→ By 2025...

Distribution and populations of plant and animal species across the city are changing, with some species flourishing while others become less common. Regular monitoring of much loved woodlands, parks and waterways allow the city to protect these natural havens from new pests and diseases, and ecosystem health is improving year on year. Well maintained wildlife corridors help animals move safely through the city, and a diverse biological management approach increases ecosystem resilience.

Communities are supported to make their gardens and growing spaces wildlife friendly, naturally spreading resilience-boosting ecological networks across the city. At the same time, adaptive incentives ensure developers connect new-builds to these networks, preventing barriers and expanding usable greenspace for all. Some brownfield sites and disused industrial areas are being transformed into pop-up community gardens, growing spaces and wildflower meadows, while others are retained as valuable habitats in their own right. This flourishing of nature is encouraging residents to spend more time outside, bringing benefits to health and wellbeing. Appropriate greenspace is being used to provide areas for holding water during heavy rainfall events, while increasing tree cover supplies shade during warmer weather and draws pollutants from the air.

These adaptation improvements are co-designed with the city's Biodiversity, Open Space and Living Landscape strategies in mind and are captured by innovative mapping, giving policy makers a holistic picture of the city's natural environment. As a result, the natural environment is acknowledged as playing a vital role in protecting people, their homes and their businesses.

“By 2050, schools are taking advantage of the gardens on their doorsteps to teach children to engage with nature, bringing the classroom outside, and the increased opportunities for outdoor recreation have improved health and wellbeing across the population.”

→ By 2050...

From atop Arthur's Seat green threads weave through Edinburgh, a natural web connecting tree-lined neighbourhoods to flourishing community gardens and parks ringed with wildflowers that change with the seasons. Nature has grown vertically as well, with edible wall-gardens and living roofs increasing biodiversity while also helping to manage water and temperature throughout the year.



Natural flood management schemes coupled with green infrastructure and the re-wilding of the city's rivers, streams and waterways is improving biodiversity while harnessing natural processes to improve drainage and water quality.

The impacts of new pests brought by the changing climate are kept to a minimum by maintaining a balance of diverse species and controlling invasive species. The public are aware of potential risks and contribute to an effective ecological monitoring scheme which allows swift action to protect nature from emerging threats.

Food production is highly visible in the city again. A wide variety of fruit trees, herbs and vegetables grow in city parks, tended and harvested by local communities. Sharing these skills, keen residents are being supported to transform private gardens into edible enclaves, increasing food security and reconnecting people with the food on their plate.

The city's vibrant, green reputation is attracting new families and new investment. Schools are taking advantage of the gardens on their doorsteps to teach children to engage with nature, bringing the classroom outside, and increased opportunities for outdoor recreation have improved health and wellbeing across the population.

THE BUILT ENVIRONMENT, INFRASTRUCTURE AND FLOOD PREVENTION



→ By 2025...

Thanks to climate smart planning and financing, active travel and use of sustainable public transport continues to grow across the city, reducing pressure on transport infrastructure, improving health and creating a more resilient network. With fewer people commuting by car, and cargo-bikes being used for many local deliveries, streets are quieter, cleaner, and more multi-functional spaces. With less congestion on key routes and proactive road maintenance ensuring road surfaces are resilient to new climate pressures, essential travel and haulage has become more efficient.

From the proud grandeur of the castle to the lived-in charm of our many tenements, maintenance of Edinburgh's iconic historic buildings is being gradually and subtly adjusted to take account of the changing climate, safeguarding the city's heritage without altering its globally celebrated character and significance. These improvements are exemplars of best practice, mixing new technology with traditional techniques and materials. Events and new guidance targeting both public agencies and private owners allow these lessons to be shared widely throughout the city and Edinburgh's innovative approach draws the attention of other historic European urban

centres, themselves facing similar pressures from the changing climate. New developments combine cutting edge technologies with green and blue architecture, such as permeable paving and rain gardens, to create demonstration sites and new buildings that are climate ready. By utilizing natural systems this green and blue infrastructure is also delivering co-benefits for carbon reduction efforts, linking climate change adaptation and mitigation.

Disruption to the public and to critical infrastructure is kept to a minimum despite an increase in the number of heavy rainfall events. By investing in sustainable drainage systems, keeping existing channels clear and redirecting water flows to areas of natural permeability, water is able to flow through the city in a controlled manner, reducing the potential for damage and keeping insurance costs low.

→ By 2050...

Edinburgh's seven hills are connected by roof-top meadows and tree-lined streets, with communities, businesses and nature thriving side-by-side. The towering grandeur of the Old Town and the elegant rise of the New Town are joined by a thread of innovative climate smart developments,

“By 2025, maintenance of Edinburgh's iconic historic buildings is being adjusted to take account of the changing climate.”

while established communities are connected to the city centre by active travel greenways.

Community gardens, growing spaces, permeable pathways and segregated cycle lanes have replaced hard surfaces, improving water permeability across the city. With fewer cars, whole streets have been reclaimed for pedestrians. Transformed into greenways, they naturally cool the city during heatwaves and protect property during flooding by allowing water to drain faster. These thoroughfares also provide new civic areas and encourage children to play outside, engaging with nature and improving their health.

Sea levels continue to rise, but land use planning and improvements to coastal defences are protecting shore communities and important industrial areas. The city is flexible and resilient: flexible from using natural processes and state of the art technology to move with the grain of the weather; resilient through using diverse energy sources – including community and small scale utilities projects – ensuring it is insulated from shocks in other areas.

SOCIETY AND ECONOMY

→ By 2025...

Edinburgh is seeing multiple rewards from early investment in adaptation. The city's businesses are benefiting from a reputation for resilience, increasing confidence amongst clients and investors, and encouraging entrepreneurs and talented staff to make the city their home. Climate opportunities and risks are well communicated, and businesses understand their impacts and dependencies on the wider environment. This preparedness keeps local businesses ahead of the curve, while flexible working and strong ICT infrastructure allow more people to work from home, reducing commuting and giving more space for family life.

Key events in Edinburgh's cultural calendar are prepared for more frequent extreme weather,

safeguarding the city's status as an international creative hub. In turn, universities and research institutes are seizing the chance to work with the city on cutting-edge adaptation projects, attracting funding and experts from across the world, and confirming Edinburgh's place in the top-flight of innovative, adaptive cities.

Work to protect the city keeps pace with the emergence of new risks. Targeted flood management improvements are informed by climate projections and prioritise the city's most vulnerable areas. As well as changing the fabric of the city, pilot resilience projects are giving citizens a real say in planning decisions, empowering neighbourhoods to meet the challenges of climate change as a community.

“By 2050, Edinburgh has seized the opportunities afforded by changing tourism patterns and made sure its many festivals and celebrations are climate ready, enhancing its status as a world destination.”

→ By 2050...

Edinburgh is widely regarded as one of the best cities in Europe to live in. Building on early successes, its distinctive neighbourhoods have risen to the adaptation challenge. Supported by local community hubs, food growing in gardens and biodiverse greenspace has greatly expanded across the city, helping people become healthier and happier. In times of extreme weather events and other emergencies these community hubs transform, using established, trusted networks to provide help and advice to those most at risk.

Edinburgh has seized the opportunities afforded by changing tourism patterns and made sure its many festivals and celebrations are climate ready, enhancing its status as a world destination. As a result the city's cultural calendar maintains a well-earned reputation for resilience, allowing residents and visitors alike to enjoy an abundance of recreational activities throughout the year.

Businesses, universities and research institutions are at the forefront of urban adaptation, exporting pioneering skills and technology to meet growing demand, and cementing Edinburgh's position as a centre of excellence. Excellent public transport and ICT infrastructure safeguards economic resilience, creating confidence in business continuity and flexibility for employees. These essential networks are powered by sustainable energy solutions, with good local capacity to insulate the city from disruption elsewhere.







Making it happen

Climate change is having a profound impact on the people, the businesses, the infrastructure and the natural habitats of cities around the world. There is an urgent need to take account of these impacts in the ways we manage, plan, work and live in our urban centres. The longer we wait, the more difficult these challenges will become.

The Edinburgh Adapts partners, and the wider Edinburgh Partnership Family, are committed to taking a leading role in making our city climate ready. This Vision sets out our ambitions for the future of the city; at its heart is a belief that the challenges of climate change can be a catalyst to a more healthy, equal, prosperous city that is resilient to shocks and works with the grain of its underlying natural systems.

Organisations and communities across the city are already working in trust and partnership to

achieve this goal. The first Edinburgh Adapts Climate Change Adaptation Action Plan, published alongside this Vision, contains over 100 actions agreed by our partners and forms the first steps in our adaptation journey. Progress on these actions will be regularly reviewed and reported by the Edinburgh Adapts Steering Group. However, to become truly climate ready will take the whole city, and that includes you! If you would like to find out more about how you, your community or your organisation can contribute to this climate ready vision please get in touch!

To view the Action Plan and other sustainability initiatives across the city visit www.sustainableedinburgh.org
For more information contact hello@sustainableedinburgh.org

Partner organisations

Adaptation
Scotland
supporting climate change resilience

• EDINBURGH •
THE CITY OF EDINBURGH COUNCIL

Edinburgh Biodiversity
Partnership



EDINBURGH WORLD HERITAGE

THE EDINBURGH PARTNERSHIP

edinburgh
LIVING LANDSCAPE

Edinburgh
College

Edible
Edinburgh
Our food. Our city.

Forest Research

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2050
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Climate Group

SGIF
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www.sgif.org.uk

Scottish Natural Heritage
All of nature for all of Scotland

Scottish Communities
Climate Action Network

Royal
Botanic Garden
Edinburgh

SUSTAINABLE
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This publication is available at www.sustainableedinburgh.org

Any inquiries about this publication should be directed to:

Strategy & Insight Division
The City of Edinburgh Council Business Centre 2.1
Waverley Court
4 Market Street
Edinburgh EH8 8BG

hello@sustainableedinburgh.org

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Lead author: David MacPherson, Sniffer.