Partnership with City of Edinburgh Council, setting a city target for Net Zero by 2030.

Established the Edinburgh Climate Commission, an independent body both challenging and supporting the city to reduce climate impact, and published recommendations for a Green Recovery in Edinburgh.

Created a city Road Map to Net Zero:
• Quantified city footprint by emissions source
• Mapped the range of measures needed to achieve net zero
• Cost/benefit analysis of mitigation measures
Edinburgh’s Emissions Footprint

Source of Emissions in 2019 by Sector

>53% from Edinburgh’s domestic and commercial building stock
<table>
<thead>
<tr>
<th>Carbon Effectiveness</th>
<th>Aggregated Carbon Savings</th>
<th>Category</th>
<th>Measure</th>
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<tbody>
<tr>
<td>Highly Effective</td>
<td>&gt;2.4 Mt CO₂</td>
<td>Domestic Insulation Improvements</td>
<td>Cavity-Wall</td>
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<td>External Wall</td>
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<td>Floor &amp; Suspended Floor</td>
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<td>Internal Wall</td>
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<td>Loft &amp; Loft Top-Up</td>
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<td>Domestic Heating Provisions &amp; Controls</td>
<td>High-Efficiency Combination Boilers</td>
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<td>Air-Source Heat Pumps</td>
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<td>Thermostatic Radiator Valves</td>
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<td>Thermostat Controls</td>
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<td>Commercial Cooling Mechanisms</td>
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<td>Passive Chilled Beams</td>
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<td>Chiller CoP5.4</td>
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<td>Office Building Stock Fabric Condition</td>
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<td>Air Tightness Improvements</td>
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<td>Transport Electrification</td>
<td>Private-EV Penetration (100% in 2037)</td>
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<td>880kt to 2.3Mt CO₂</td>
<td>Domestic Electricity/Heat Demand Reductions</td>
<td>Turning Unnecessary Lighting Off</td>
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<td>Reducing Internal Temperature by 1C</td>
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<td>A++ Rated Cold Appliances</td>
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<td>A+ Wet Appliances</td>
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<td></td>
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<td>Commercial Heating Provisions</td>
<td>Air-Source Heat Pumps</td>
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<td>Domestic Lighting</td>
<td>Low Energy Lighting</td>
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</tbody>
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**Most Carbon Effective Measures**

- Highly Effective
  - Domestic Insulation Improvements
  - Domestic Heating Provisions & Controls
  - Commercial Cooling Mechanisms
  - Office Building Stock Fabric Condition
  - Transport Electrification

- Very Effective
  - Domestic Electricity/Heat Demand Reductions
  - Commercial Heating Provisions
  - Domestic Lighting
<table>
<thead>
<tr>
<th>Cost Effectiveness</th>
<th>Potential Cost Savings</th>
<th>Category</th>
<th>Measure</th>
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<tbody>
<tr>
<td>Highly Effective</td>
<td>&gt;250 £2018M</td>
<td>Domestic Building Stock Insulation</td>
<td>Cavity-Wall</td>
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<td>Loft &amp; Loft Top-Up</td>
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<td>A Rated Appliances</td>
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<td>Induction Hubs</td>
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<td>Low Energy Lighting</td>
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<td>Kommercial Building Stock Improvements</td>
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<td>Fabric Improvements</td>
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<td>Low Energy Retail &amp; Office Cooling Systems</td>
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<td>Domestic Heating Provisions &amp; Controls</td>
<td>High-Efficiency Combination Boilers</td>
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<td>Thermostatic Valve Controls</td>
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<td>Tank Insulation</td>
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<td>Electric Bus Penetration</td>
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<td>Pumping Equipment Upgrades</td>
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<td>Industrial Processes &amp; Equipment</td>
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<td>Commercial and Domestic Fabric</td>
<td>Boilers and Steam Piping Upgrades</td>
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<td>Draught Proofing Measures</td>
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<tr>
<td>Moderately Effective</td>
<td>&lt;25 £2018M</td>
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### Cost-Effective Measures

<table>
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<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Climate Impact</strong></td>
<td>55.91% Reduction in Overall Emissions</td>
</tr>
<tr>
<td><strong>Return on Investment</strong></td>
<td>Economic Return on Commercial Terms</td>
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<tr>
<td></td>
<td>£550M/year in Energy Cost Savings across the city</td>
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<td>Payback in 7.5 years</td>
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<tr>
<td><strong>Economic Opportunities</strong></td>
<td>7,291 Jobs Created</td>
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<tr>
<td></td>
<td>Savings for Individuals, Businesses &amp; Communities</td>
</tr>
<tr>
<td><strong>Social, Environmental and Economic Benefits</strong></td>
<td>Improved Public Health</td>
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<td>Reduced Fuel Poverty</td>
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<tr>
<td></td>
<td>Improved Economic Productivity</td>
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</table>

**Investment Required £3.796 Bn**

56% of Net Zero in Edinburgh by 2030
# Cost-Neutral Measures

<table>
<thead>
<tr>
<th>Cost</th>
<th>Neutral Measures</th>
<th>Social, Environmental and Economic Benefits</th>
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</thead>
<tbody>
<tr>
<td>Climate Impact</td>
<td>61.83% Reduction in Overall Emissions</td>
<td>Improved Public Health</td>
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<tr>
<td>Return on Investment</td>
<td>Economic Return on Commercial Terms £566M/year in Energy Cost Savings across the city Payback in 12.5 years</td>
<td>Reduced Fuel Poverty</td>
</tr>
<tr>
<td>Economic Opportunities</td>
<td>16,054 Jobs Created Savings for Individuals, Businesses &amp; Communities</td>
<td>Improved Economic Productivity</td>
</tr>
</tbody>
</table>

**Investment Required £7.492 Bn**

62% of Net Zero in Edinburgh by 2030
Objective 1:

We will become a zero carbon and zero waste university.

Developing and pioneering approaches to deliver a zero carbon and circular economy and protecting and enhancing biodiversity.
We are one of the largest investors in city Edinburgh’s built environment:

• We should leverage our investment to drive down city emissions
• Can use Tier 1 supplier relationships to drive change through supply chains
• University estate can be a living lab for innovation
CLIMATE EMERGENCY COLLABORATION PROJECT

Phase 1: Building Capacity for Better Building Performance

Phase 2: Developing Post-Construction Emission Reduction Tools
Building efficiency can and should be better optimised in the context of a climate emergency.

The building performance delivered at the end of a project often doesn’t match the original ambition or intent.

The performance gap doesn’t arise because technologies and materials to deliver better performance don’t exist.

It primarily arises from decisions made at various stages in the project lifecycle, without the right skills and knowledge at the right time to support them.
How we’ve gone about it. Series of workshops:

- **Contractor:** to confirm construction sector capability and commitment to deliver building performance.
- **Client:** to test our assumptions on how current processes and priorities affect project outcomes.
- **Shared Commitment:** to propose new approaches to future projects and open these for discussion.
Likely outputs from emerging findings are the need to:

- **Prioritise different outcomes** and embed these throughout the project lifecycle.

- **Change contracting processes** to support more effective and timely input and engagement.

- **Build knowledge, skills and capacity at all levels** to ensure climate impact is embedded in decision making, through concept, design and delivery to occupancy.
Jamie Brogan
Head of Innovation & Skills
Edinburgh Centre for Carbon Innovation

29th October 2020
Sustainable Construction Topic Support Network