





UNIVERSITY of STRATHCLYDE
**INSTITUTE FOR
FUTURE CITIES**



Institute for Future Cities

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Improve
the quality of
human
life in
cities



ACROSS THE world

Institute: Mission and Vision

Future Cities Themes

- **Sustainability**
- **Resilience**
- **Health and Wellbeing**
- **Urban Design and migration**
- **Smart cities: business and public service innovation**



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ISS025E009858

Growing Economic Dominance

- Cities currently generate over 80% of global GDP
- 120 cities in the world generate \$20.2 trillion in GDP – or 29% of global total
- To 2025, 600 cities will account for nearly 65 percent of global GDP growth
- Boston Consulting Group considers the rise of cities to be the “single largest commercial growth opportunity globally in the decade ahead”
- The global market for smart cities solutions alone is estimated at £200 billion per annum

Cities rely on critical systems

- food production and preservation
- transportation
- construction
- water handling
- waste handling
- communication
- economic systems
- energy systems
- health systems

Critical systems rely on cities

- food production and preservation
- transportation
- construction
- water handling
- waste handling
- communication
- economic and financial systems
- energy systems
- health systems

The Growth of Cities

Developments in social systems are also essential

- Social structures
- Codes of behaviour
- Systems of government
- Systems of law

Cities as a solution

Cities offer opportunities:

- **to tackle poverty**
- **improve health and education**
- **deliver economic growth**
- **reduce environmental impacts**

Policy Objectives

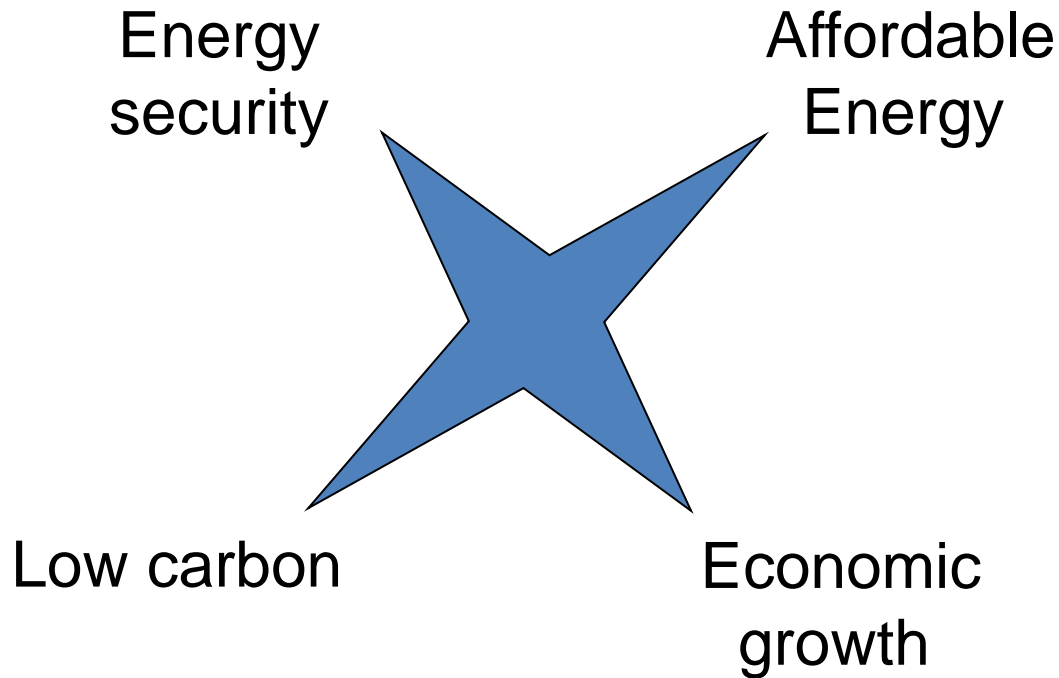
Energy
security

Affordable
Energy

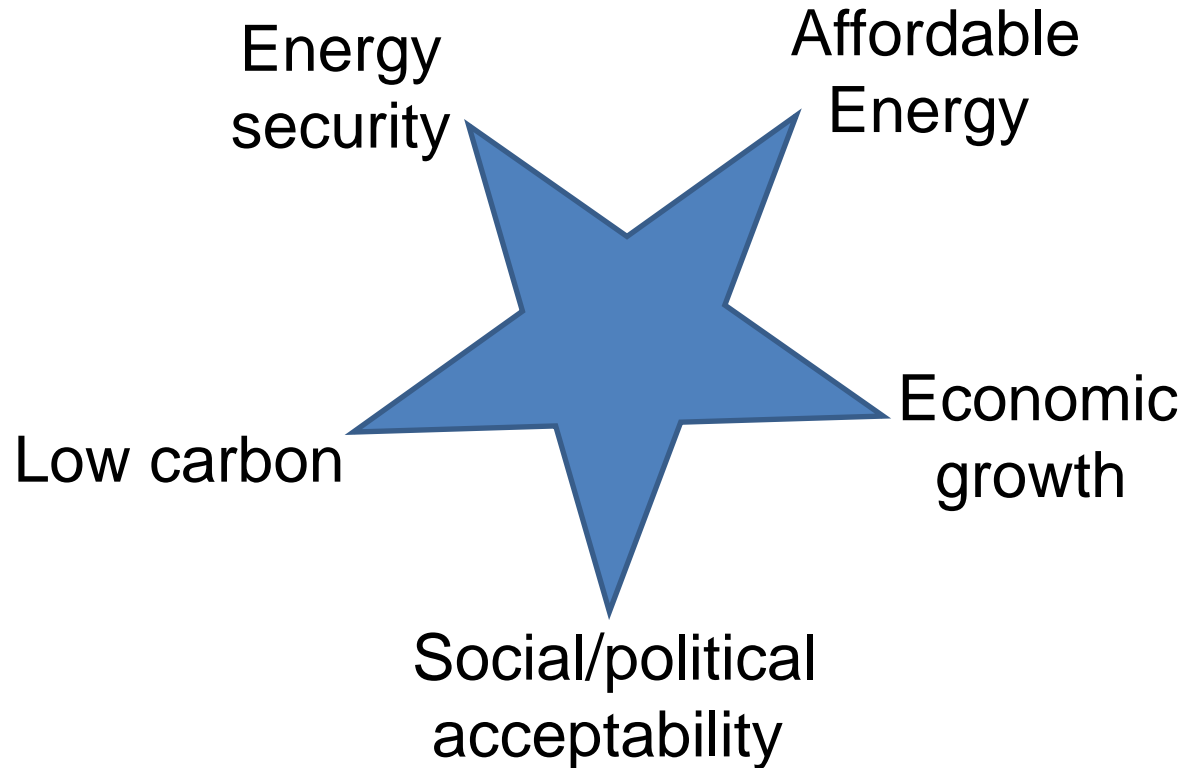


Low carbon

Policy Objectives



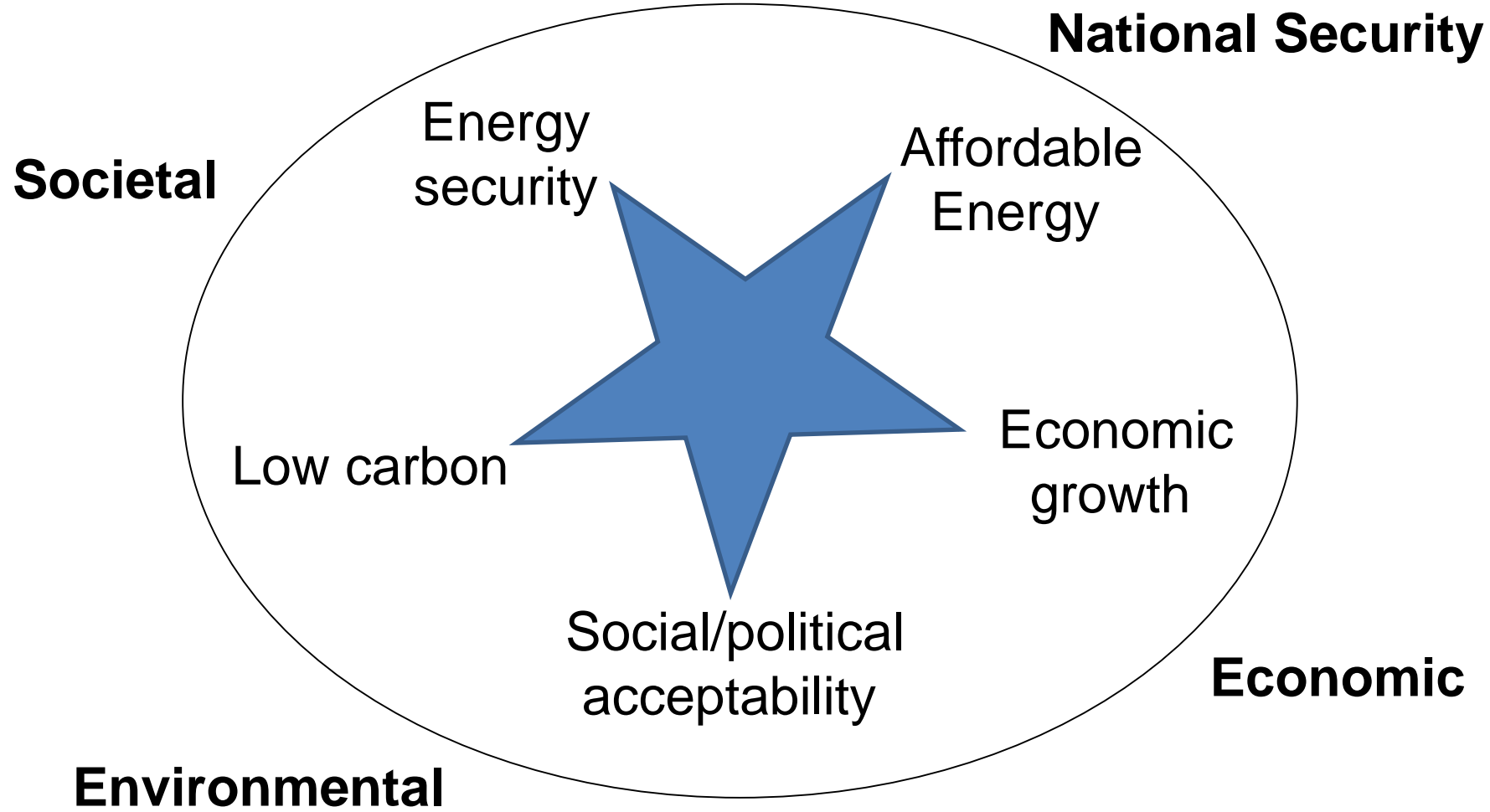
Policy Objectives



Not one public – many publics



Policy Objectives



UK city sustainability issues

- **Economic growth**
- **Demographic change**
- **Decarbonisation of energy systems**
- **High energy costs**
- **Fuel poverty**

Example sustainability policy objectives

- **Achieve net zero carbon**
- **Reduce energy poverty**
- **Generate green jobs**
- **Improve environmental quality**
 - **Improve air quality**
 - **Access to green spaces**
 - **Reduce noise pollution**
 - **Enhance biodiversity**

Example sustainability policy objectives

- **Achieve net zero carbon**
 - **Generate more renewable energy**
 - **Improve energy efficiency**
 - **Abandon use of high carbon fuels**
 - **Adopt sustainable transport systems**
 - **Reduce use of high carbon goods/services**

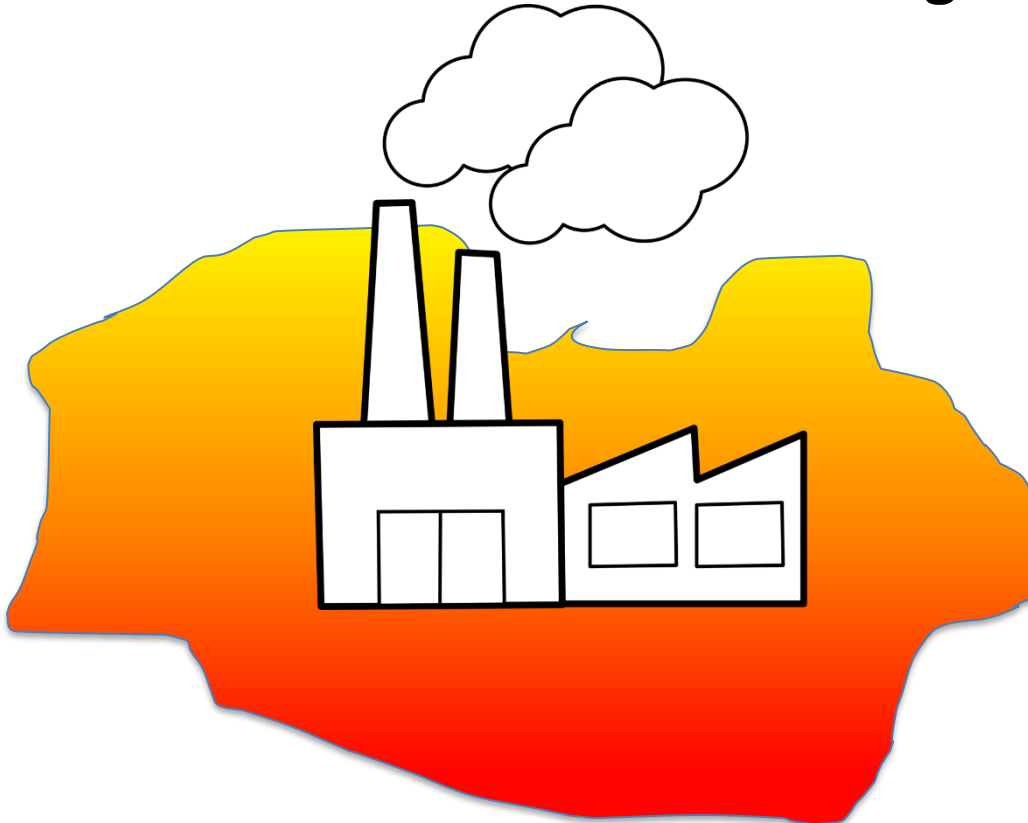
Glasgow's Overall Target

- **Achieve net zero carbon by 2030**



What do we mean by carbon neutrality?

- Just the carbon emitted within Glasgow's boundaries?





What do we mean by carbon neutrality?

- Or the carbon footprint of the goods and services consumed by Glasgow?





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**Full carbon footprint neutrality currently
extremely difficult to achieve in practice**



Achieving geographic carbon neutrality

- **Not Easy**
- **Not Cheap**
- **Not Quick**
- **Is achievable – but will require:**
 - **large scale investment**
 - **significant policy change**
 - **action over a period of decades**

Glasgow's Overall Target

- **Achieve net zero carbon by 2030**
 - **But the city has limited control**

Cities rely on critical systems - but have limited control

- food production and preservation
- transportation
- construction
- water handling
- waste handling
- communication
- economic and financial systems
- energy systems
- health systems

Policy levers

Example Policy interventions

- Regulation (planning, environmental)
- Changes in public procurement policy
- Direct investment in infrastructure/pilots/demonstrators
- Direct public ownership (eg of energy and transportation systems)
- Delivery of enabling infrastructure and services
- Taxation changes
- Promotion of behavioural change

Long term softer levers

- Strategic planning
- Persuasion/influencing/facilitation
- Vision/leadership
- Education and research

sustainable glasgow



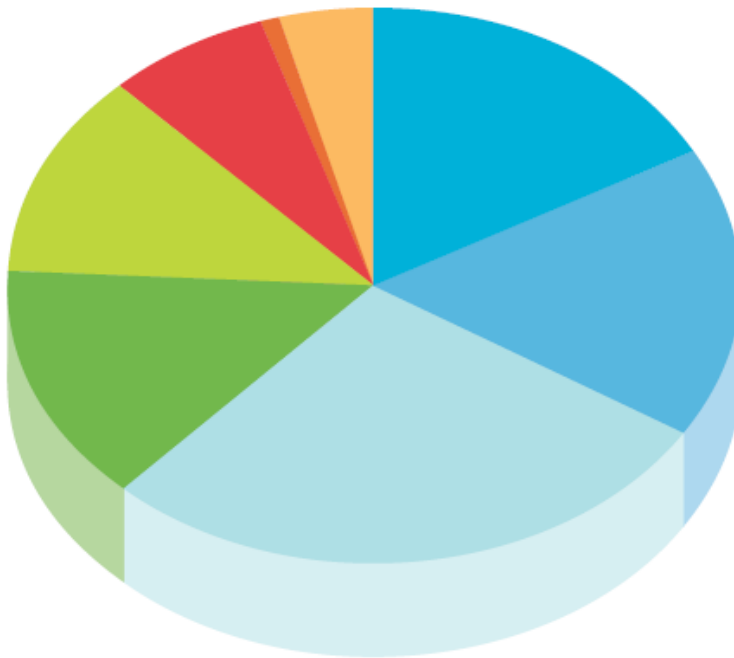
www.sustainableglasgow.org.uk

A holistic approach

- **The whole city**
- **Evidence based**
- **Technology neutral**
- **Long term strategic view**
- **Creating supportive public policies and business models**
- **A partnership between the university, local government, and the commercial sector**



Glasgow's Carbon Footprint

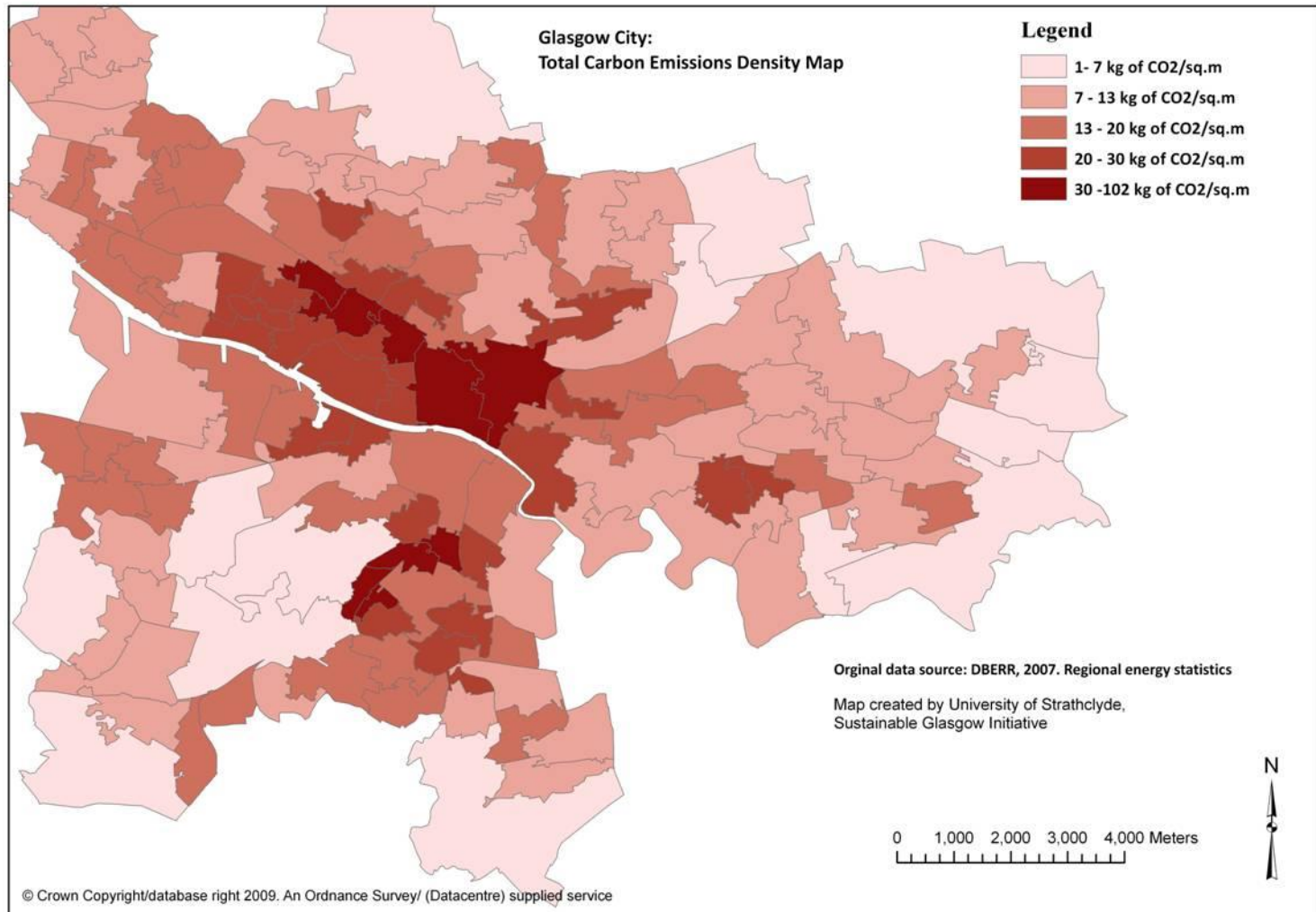


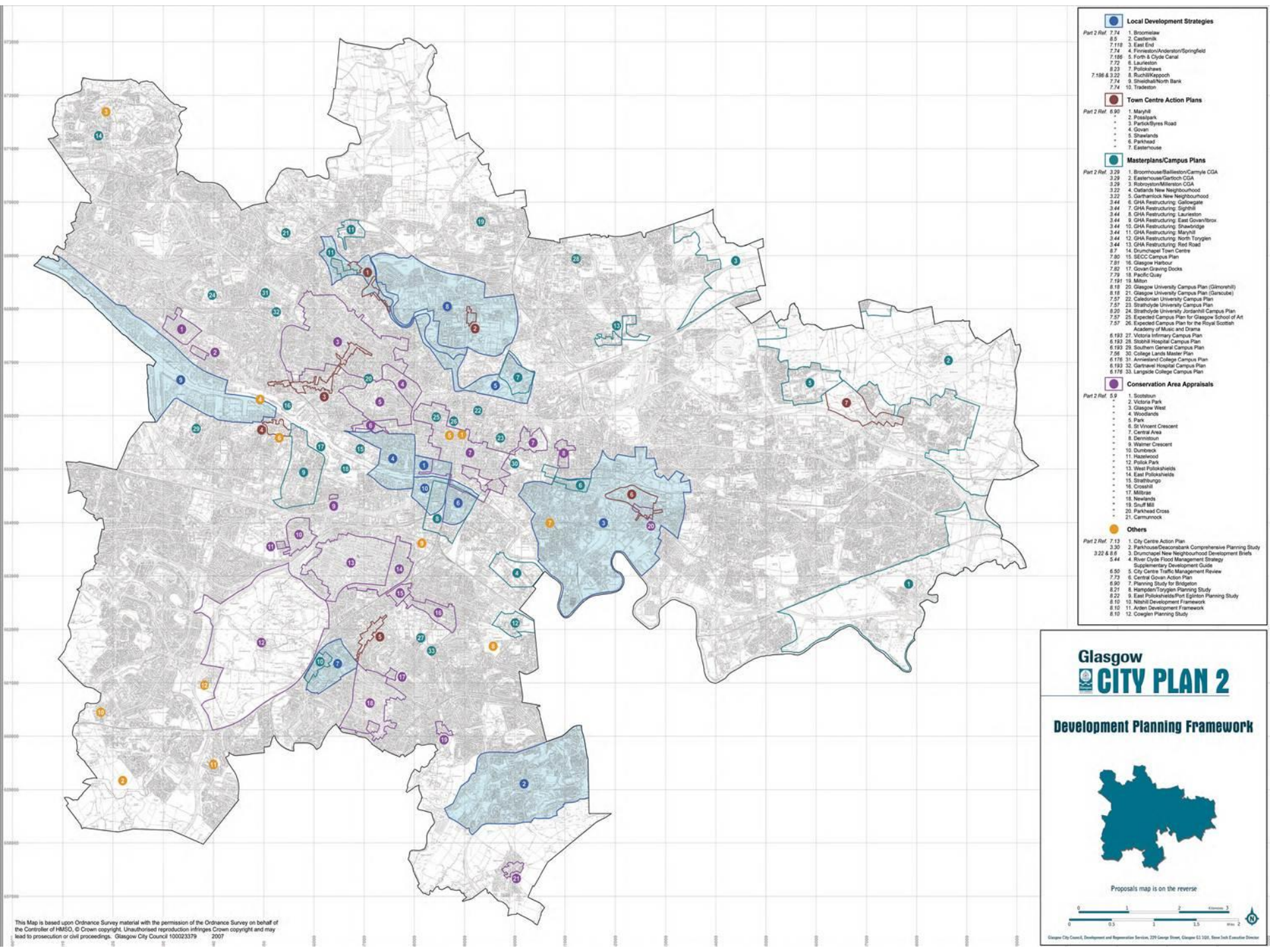
Glasgow's Carbon Footprint - 2006/07

Annual Carbon Dioxide Emissions for Glasgow City

| | |
|-----------------------------------|-----|
| Domestic Electricity | 17% |
| Domestic Gas | 17% |
| Industrial/Commercial Electricity | 28% |
| Industrial/Commercial Gas | 14% |
| Personal Transport | 12% |
| Road Freight | 7% |
| Buses | 1% |
| Coal, Oil | 4% |

A New Approach





- Local Development Strategies**
- Part 2 Ref. 7.74
- 1. Broomhall
 - 2. Castlemilk
 - 7.118 3. East End
 - 7.74 4. Foresthill/Anderson/Springhill
 - 7.186 5. Forth & Clyde Canal
 - 7.72 6. Laurieston
 - 8.23 7. Pollokshaws
 - 7.186 & 3.22 8. Ruchill/Kepnock
 - 7.74 9. Shawlands/North Bank
 - 7.74 10. Tradeston
- Town Centre Action Plans**
- Part 2 Ref. 6.90
- 1. Maryhill
 - 2. Pitthead
 - 3. Patrick/Bayes Road
 - 4. Govan
 - 5. Shawlands
 - 6. Parkhead
 - 7. Easterhouse
- Masterplans/Campus Plans**
- Part 2 Ref. 3.29
- 1. Broomhouse/Ballicorn/Campyle CGA
 - 3.29 2. Easterhouse/Gartloch CGA
 - 3.29 3. Robson/Millerston CGA
 - 3.22 4. Cathside New Neighbourhood
 - 3.22 5. Garthamlock New Neighbourhood
 - 3.44 6. GHA Restructuring: Gallowgate
 - 3.44 7. GHA Restructuring: Signal
 - 3.44 8. GHA Restructuring: Laurieston
 - 3.44 9. GHA Restructuring: East Govan/Brown
 - 3.44 10. GHA Restructuring: Shawbridge
 - 3.44 11. GHA Restructuring: Maryhill
 - 3.44 12. GHA Restructuring: North Torgien
 - 3.44 13. GHA Restructuring: Red Road
 - 3.7 14. Drumchapel Town Centre
 - 7.80 15. SECC Campus Plan
 - 7.81 16. Glasgow Harbour
 - 7.82 17. Govan Graving Docks
 - 7.79 18. Pacific Quay
 - 7.191 19. Milton
 - 8.18 20. Glasgow University Campus Plan (Glasgow)
 - 8.18 21. Glasgow University Campus Plan (Glasgow)
 - 7.57 22. Caledonian University Campus Plan
 - 7.57 23. Strathclyde University Campus Plan
 - 8.20 24. Strathclyde University Jordanhill Campus Plan
 - 7.57 25. Expected Campus Plan for the Glasgow School of Art
 - 7.57 26. Expected Campus Plan for the Royal Scottish Academy of Music and Drama
- Conservation Area Appraisals**
- Part 2 Ref. 5.9
- 1. Scotland
 - 2. Victoria Park
 - 3. Glasgow West
 - 4. Woodlands
 - 5. Park
 - 6. St Vincent Crescent
 - 7. Central Area
 - 8. Dennistoun
 - 9. Warner Crescent
 - 10. Dumbreck
 - 11. Hazlewood
 - 12. Pollok Park
 - 13. West Pollokshields
 - 14. East Pollokshields
 - 15. Strathbungo
 - 16. Crosshill
 - 17. Millbrae
 - 18. Newlands
 - 19. South M
 - 20. Parkhead Cross
 - 21. Camarnock
- Others**
- Part 2 Ref. 7.13
- 1. City Centre Action Plan
 - 3.22 & 6.6 2. Parkhouse/Deaconsbank Comprehensive Planning Study
 - 3.22 & 6.6 3. Drumchapel New Neighbourhood Development Briefs
 - 5.44 4. River Clyde Flood Management Strategy
 - 5.50 5. City Centre Traffic Management Review
 - 7.73 6. Central Govan Action Plan
 - 6.90 7. Planning Study for Bridgford
 - 8.21 8. Hampden/Tongue Planning Study
 - 8.22 9. East Pollokshields/Port Eglinton Planning Study
 - 8.10 10. National Development Framework
 - 8.10 11. Arden Development Framework
 - 8.10 12. Cowglen Planning Study

Glasgow CITY PLAN 2

Development Planning Framework



Proposals map is on the reverse





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**Glasgow has significant
opportunities**

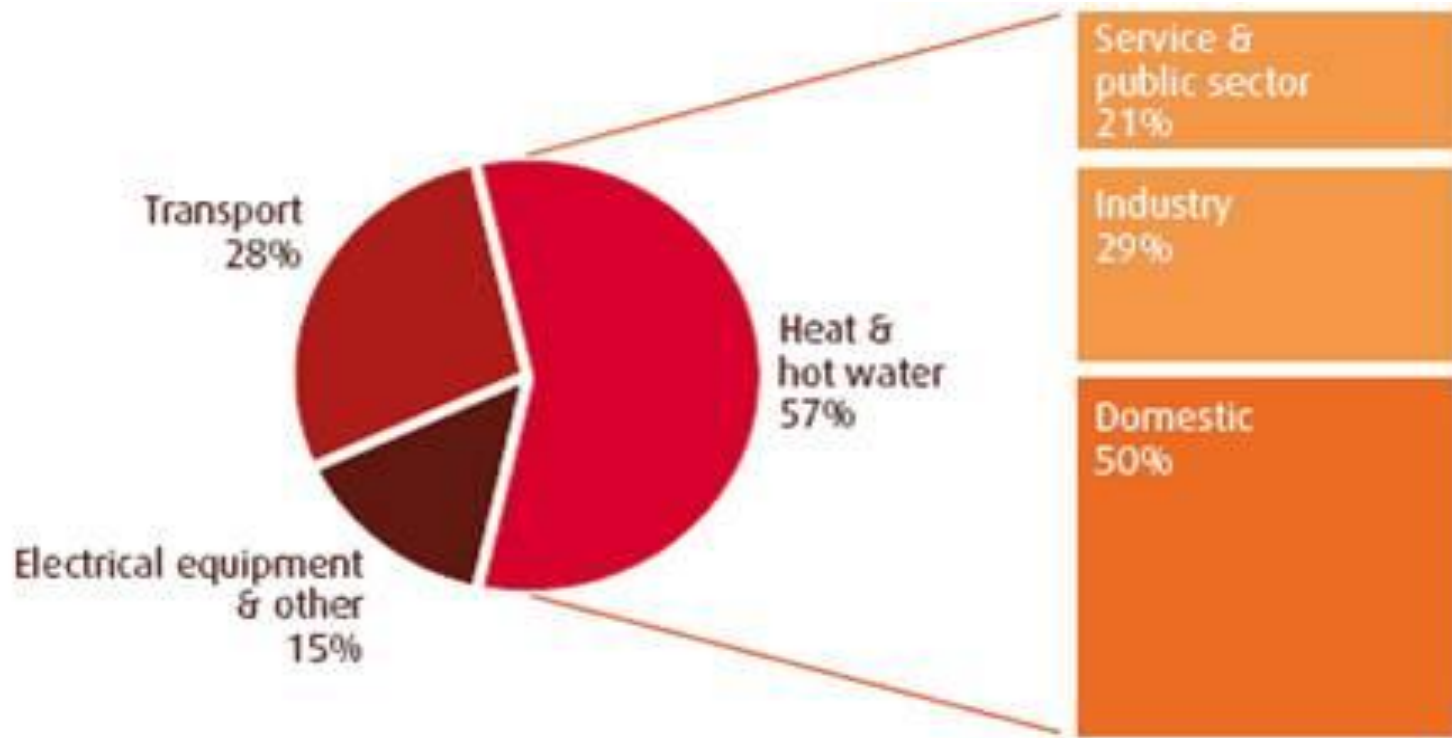


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**Grid electricity is expected to
decarbonise due to wider policy
actions**



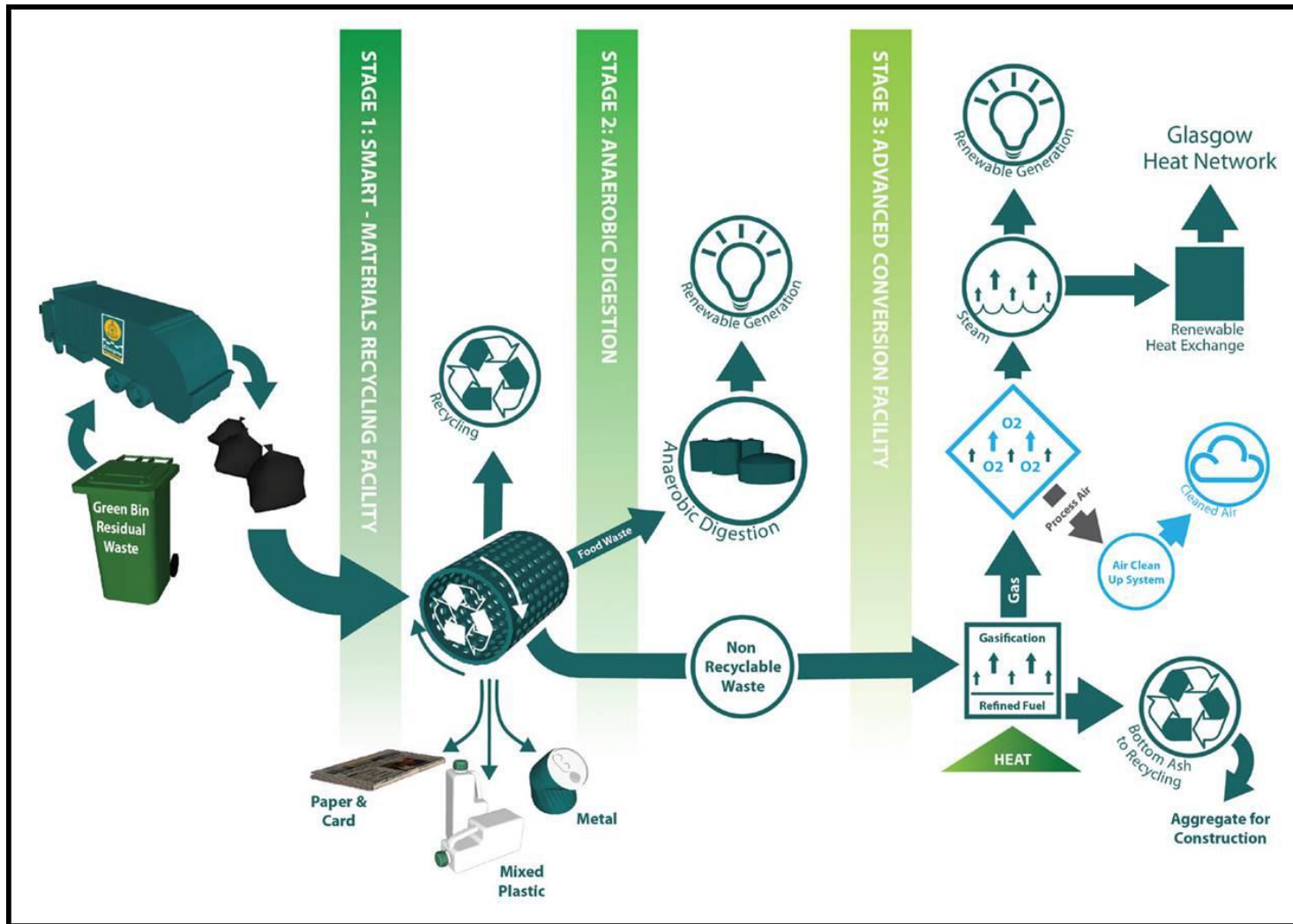
The Role of Heat



Waste to Energy



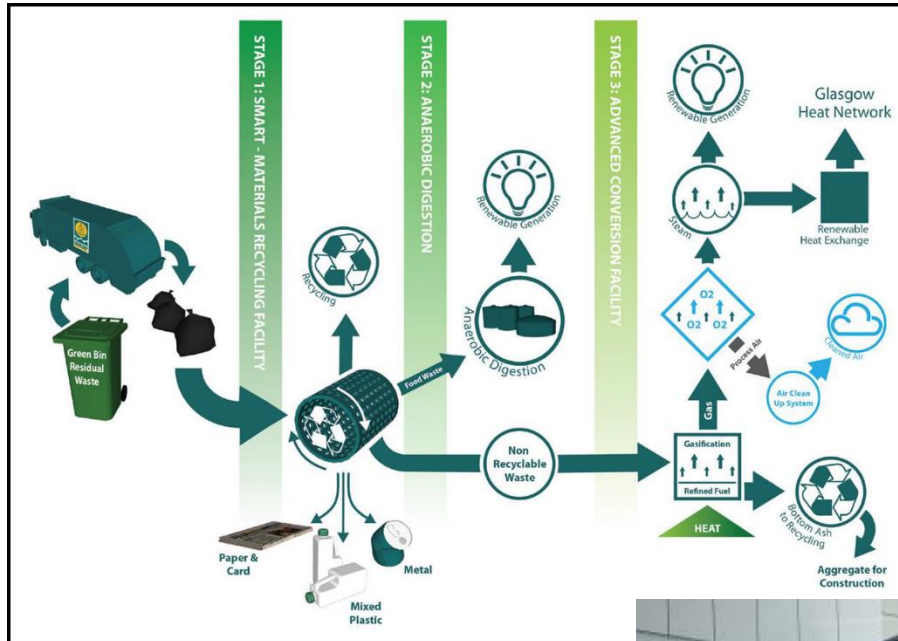
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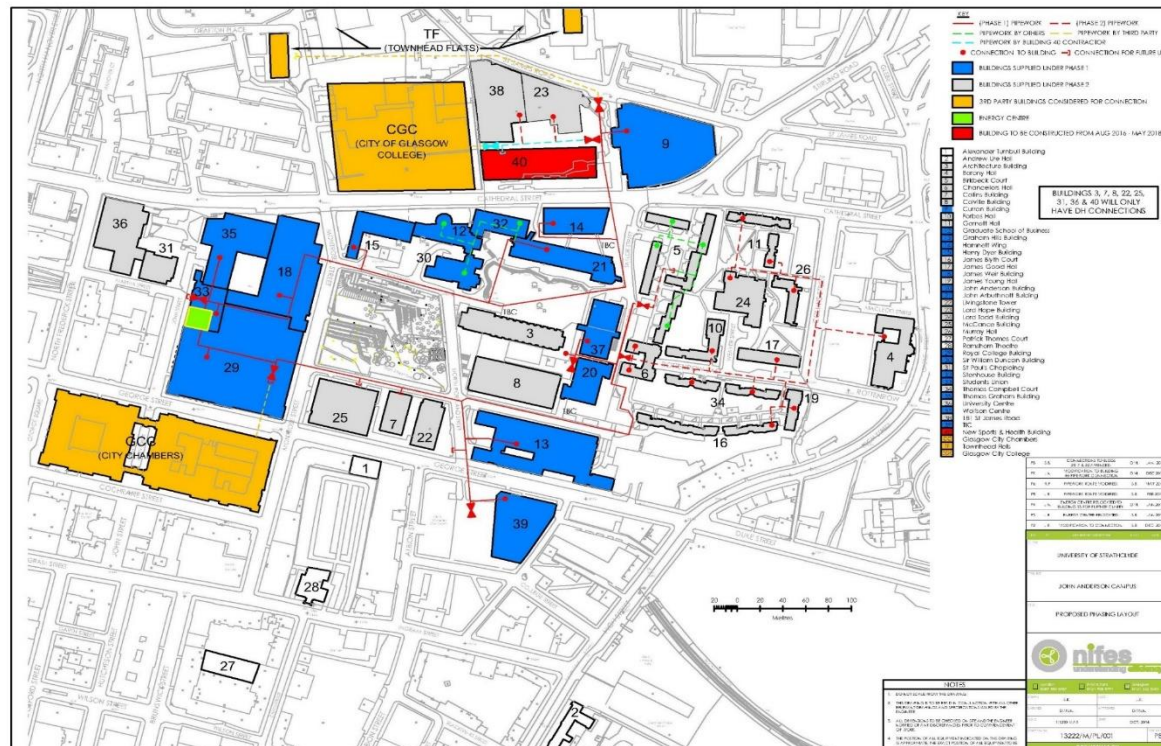
Waste to Energy



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- **A £20 million investment**
- **Reducing Strathclyde's CO₂ Emissions by 50%**





Delivering Glasgow carbon neutrality should focus on

- **Heat**
- **Transport**



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Commonwealth Games



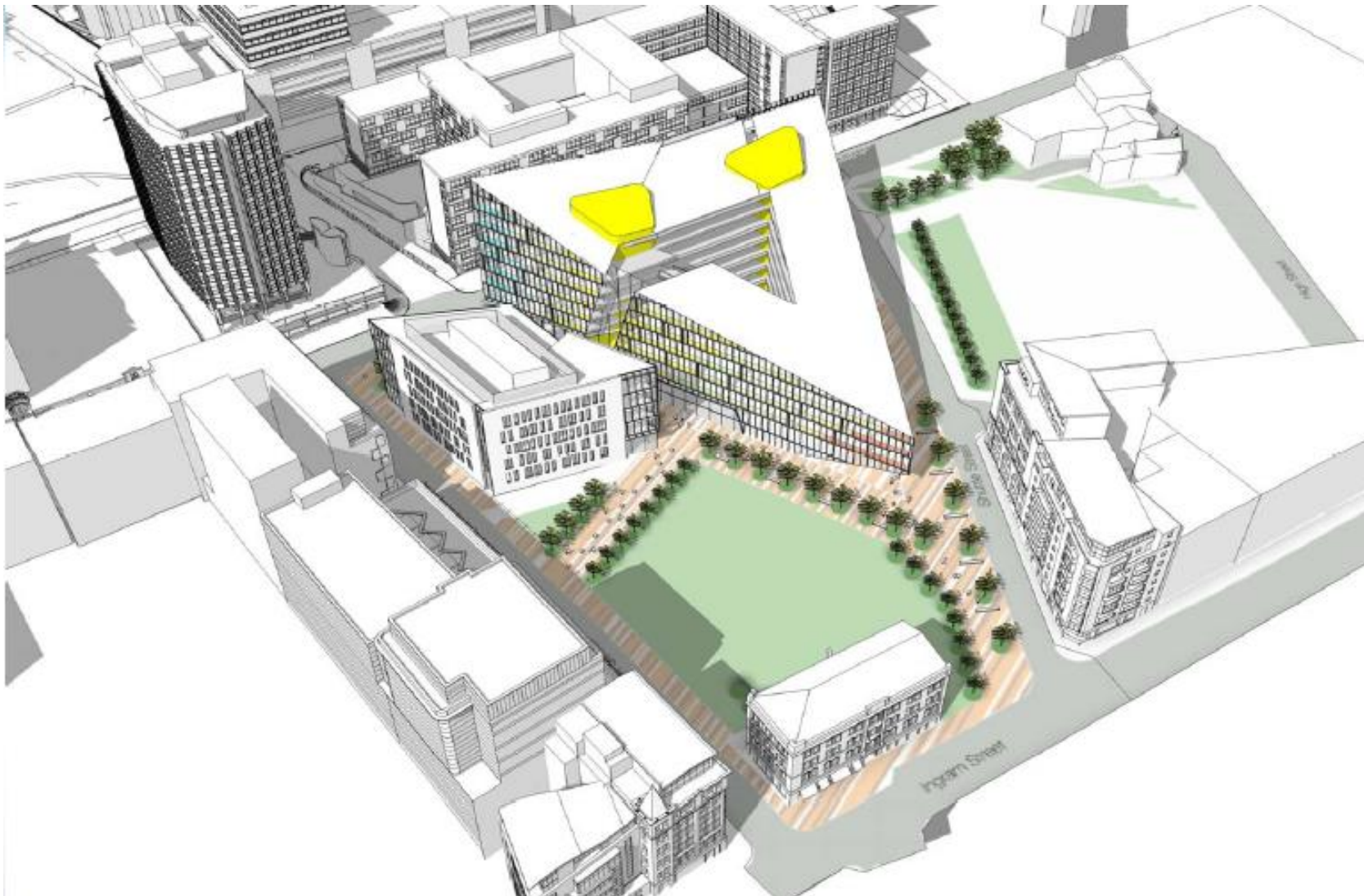
GLASGOW 2014
XX COMMONWEALTH GAMES



Commonwealth Games Village



TIC



Southern General Hospital





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**Grasp your windows of
opportunity**

Glasgow Policy Interventions

- **Planning**
 - District heating zones
 - Building energy efficiency regulations
- **Public Procurement**
- **Transport**
 - Creation of Low Emission Zones
 - Cycle lanes
 - Improved public transport
 - Regulation of buses
- **Investment in energy efficiency**
 - Social Housing, Schools, public buildings
- **Investment in renewable energy**
 - Waste to Energy
 - Solar Energy
 - Wind
- **Environmental Regulation**
 - Air Quality Improvement



Heat actions

- **Improve building energy efficiency**
- **Develop heat networks**
- **Identify windows of opportunity eg Commonwealth Games**
- **Require connection to heat networks**
- **Create an ESCO to help trade heat across Glasgow**
- **Create partnerships with existing district heating network and investors**
- **Sell surplus heat from GRREC**
- **Capture surplus heat from other facilities (eg breweries, bakeries)**
- **Develop additional low carbon heat generation (eg geothermal?)**



Transport actions

- **Support EV adoption (public and commercial fleets first)**
- **Reduce road vehicle numbers**
 - **Improve mass transit systems**
 - **Congestion charging/ Low Emission Zones**
 - **Integrated freight systems/ freight consolidation**
 - **Increase city centre parking charges**
 - **Restrict vehicles from larger areas of the city centre**
- **Improve vehicle transit times**
 - **Smart traffic management**



We are at the start of a journey

- **Real progress achieved – but much more needed**
 - Strong partnerships
 - Significant investment
 - City scale projects
 - Policy change
- **Major opportunities will continue to emerge**
- **More progress needed on transport and heat**
- **Need to integrate with national and regional programmes**



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**Do cities have the right powers
to deliver on carbon neutrality
and sustainability cities?**



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Thank you

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