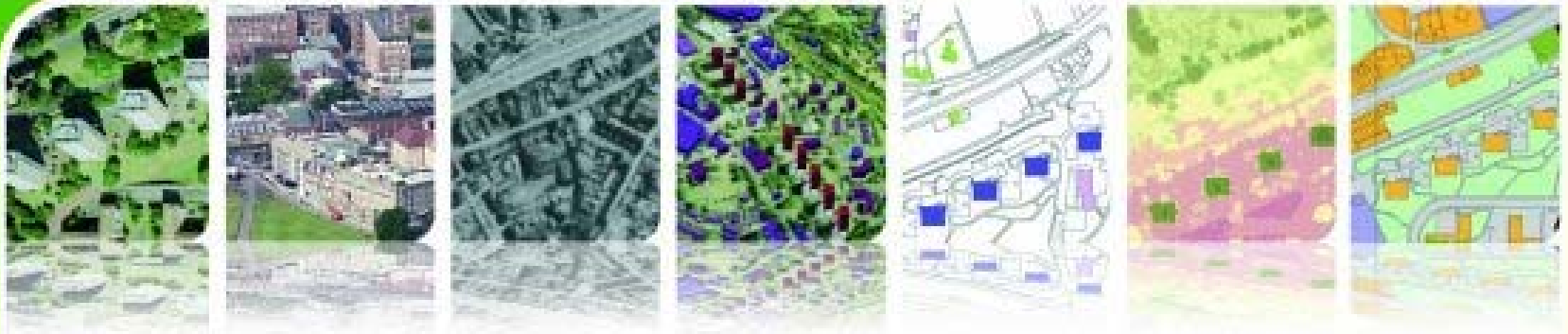


How Green are you ?



Cities Revealed™

Action planning and delivery for Climate Change

This presentation shows how you can perform a carbon emission audit on all properties and land areas that you have responsibility for.

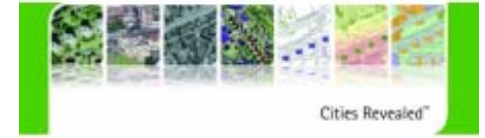


The GeoInformation Group



NATIONAL
ENERGY
FOUNDATION

Working in partnership to reduce Carbon Emissions



Executive summary

1. Whilst **you** might have very green objectives and attitudes, how sure are you that these apply to all within your authority area, for example
 - Council properties, civic centres, housing stock, industrial, retail commerce and non council owned residential areas
2. The Climate Change Bill 2008 commits the UK Government to reduce its carbon emissions by **60%** by 2050
3. For Local Authorities in England this target will be measured through the National Indicators
 - **National Indicators (NI 185, 186, 187, 188)**
4. Surveying all the buildings and land in a cost effective, consistent and accurate manner is only possible through the use of thermal aerial surveys.
5. Highly detailed thermal images captured from aerial surveys at night show the temperature loss of all buildings and can accurately pinpoint those properties and businesses who need support and action to help you meet your targets.
7. **This presentation shows you how we can deliver a building by building energy loss survey and deliver you key information to reduce your carbon emissions to meet Government targets**

FACT: A 2°C reduction in building temperature equals a 15% reduction in CO2 emissions¹.

¹ See Appendix 1

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The problem



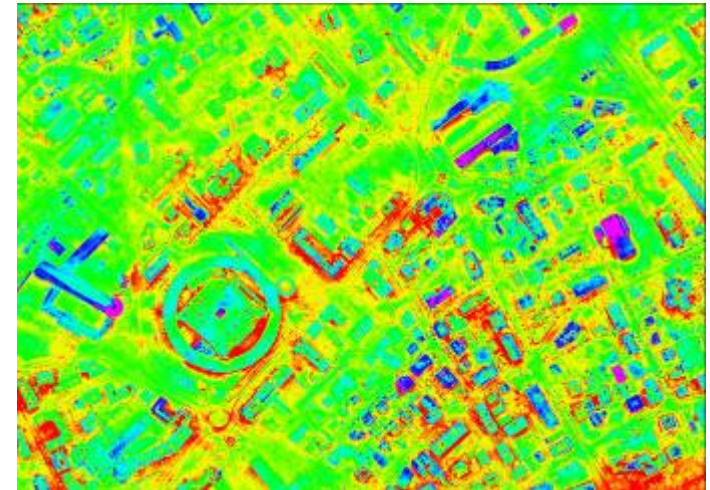
- To meet these national targets you will have to implement a climate change action plan; you may already be doing this
- However:
 - How can you ensure everyone is doing their bit?
 - How do you show that you and your authority are setting a example?
 - How do you measure this?
 - How do you show improvement?
 - How do you convince others to do their bit?
- Energy loss from buildings is responsible for between 30% and 40 % of our carbon emissions.
- How do you effectively, accurately and consistently measure all the buildings in your authority to ensure you and everyone in your authority are doing everything they can to reduce energy loss from buildings?



Our solution



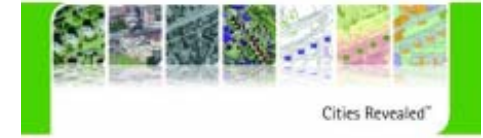
- Thermal imaging of buildings gives a very accurate and consistent way of measuring heat loss from buildings.
- When combined with information on the use, structural type and age of the building useful indicators as to the carbon emission can be calculated along with an appropriate action plan.
- When the thermal survey is conducted using the latest technology thermal cameras mounted on a specially modified survey aircraft, large areas can be captured in a very short space of time
 - 4 hours of aerial survey can cover the same area as a ground survey team would cover in a one month; so saving more energy!



Thermal image showing hot areas in red and orange and cool areas in green and blue.



Carbon Emission Indicator database

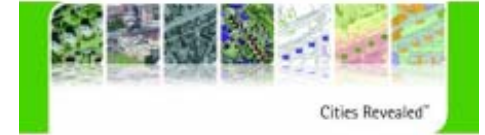


- An integrated database is produced containing address information, with CO₂ emissions, thermal heat loss values, building type, use and age.

NLPG UPRN	House No	Street Address	Area	Locality	Postcode	Heat Loss	CO2	Useage	Age	Type	Action Plan
100080154883	55	INKERMAN STREET	Newby	Bridgehall	BR1 1JD	5	Red	Residential	Edwardian	Terraced	Priority
100080154883	55	INKERMAN STREET	Newby	Bridgehall	BR1 1JD	4	Red	Residential	Edwardian	Terraced	Urgent
100080154897	82	INKERMAN STREET	Newby	Bridgehall	BR1 1JD	4	Red	Residential	Edwardian	Terraced	Urgent
100080131538	40	BRANTWOOD ROAD	Newby	Bridgehall	BR1 1JJ	5	Red	Residential	1980s- 1990s	Detached	Priority
100080126098	23	ASHBURNHAM ROAD	Newby	Bridgehall	BR1 1JN	3	Yellow	Residential	Victorian	Semi Detached	Important
100080126214	141	ASHBURNHAM ROAD	Newby	Bridgehall	BR1 1JW	2	Blue	Residential	Victorian	Semi Detached	Hold
100080126217	143	ASHBURNHAM ROAD	Newby	Bridgehall	BR1 1JW	2	Blue	Residential	Victorian	Semi Detached	Hold
100080126242	165	ASHBURNHAM ROAD	Newby	Bridgehall	BR1 1JW	1	Green	Residential	InterWar	Detached	No action
100080133841	29	BUTLIN ROAD	Newby	Bridgehall	BR1 1LB	5	Red	Residential	Post War	Semi Detached	Priority
100080133841	29	BUTLIN ROAD	Newby	Bridgehall	BR1 1LB	5	Red	Residential	PostWar	Terraced	Priority
100080133865	53	BUTLIN ROAD	Newby	Bridgehall	BR1 1LB	4	Red	Residential	PostWar	Terraced	Urgent
100080133865	53	BUTLIN ROAD	Newby	Bridgehall	BR1 1LB	5	Red	Residential	PostWar	Terraced	Priority
100080133876	64	BUTLIN ROAD	Newby	Bridgehall	BR1 1LD	4	Red	Residential	PostWar	Terraced	Urgent
100080163424	23	NASEBY ROAD	Newby	Bridgehall	BR1 1LE	3	Yellow	Residential	PostWar	Terraced	Important
100080163407	6	NASEBY ROAD	Newby	Bridgehall	BR1 1LF	3	Yellow	Residential	Modern	Detached	Important
100080163942	12	NEWCOMBE ROAD	Newby	Bridgehall	BR1 1LH	1	Green	Residential	Modern	detached	No action
200003282698	MECCA BINGO	Skimpot Rd	Newby	Bridgehall	BR4 QJB	5	Red	Leisure	N/A	N/A	Priority
200003282699	STANLEY CASINO	Skimpot Road	Newby	Bridgehall	BR4 QJB	5	Red	Leisure			Priority
100081194481	CURRY'S	Chaul End Lane	Newby	Bridgehall	BR4 8EZ	3	Yellow	Retail			Important
100081310840	MFI	CHAUL END LANE	Newby	Bridgehall	BR4 8EZ	3	Yellow	Retail			Important
100081006994	CAPWELL GRANGE	Addington Way Oakley Road Luton	Newby	Bridgehall	BR4 9GR	5	Red	Insitutional			Priority
100081331393	GREEN COURT	GREEN CLOSE	Newby	Bridgehall	BR4 9PJ	5	Red	Religious			Priority
100081178976	CMVC CENTRE	Market Square	Newby	Bridgehall	BR1 1TG	4	Orange	Government			Urgent

Thermal Surveys

Cities Revealed



- Thermal imaging cameras mounted on aircraft, flown at night, in winter will show the heat loss for all buildings and land in your authority



Latest thermal imaging camera,
Accurate to $<0.02^{\circ}\text{C}$



Our aerial survey aircraft
ready to take off on a
night time thermal
survey



50 cm resolution thermal image, red is hot, green cool

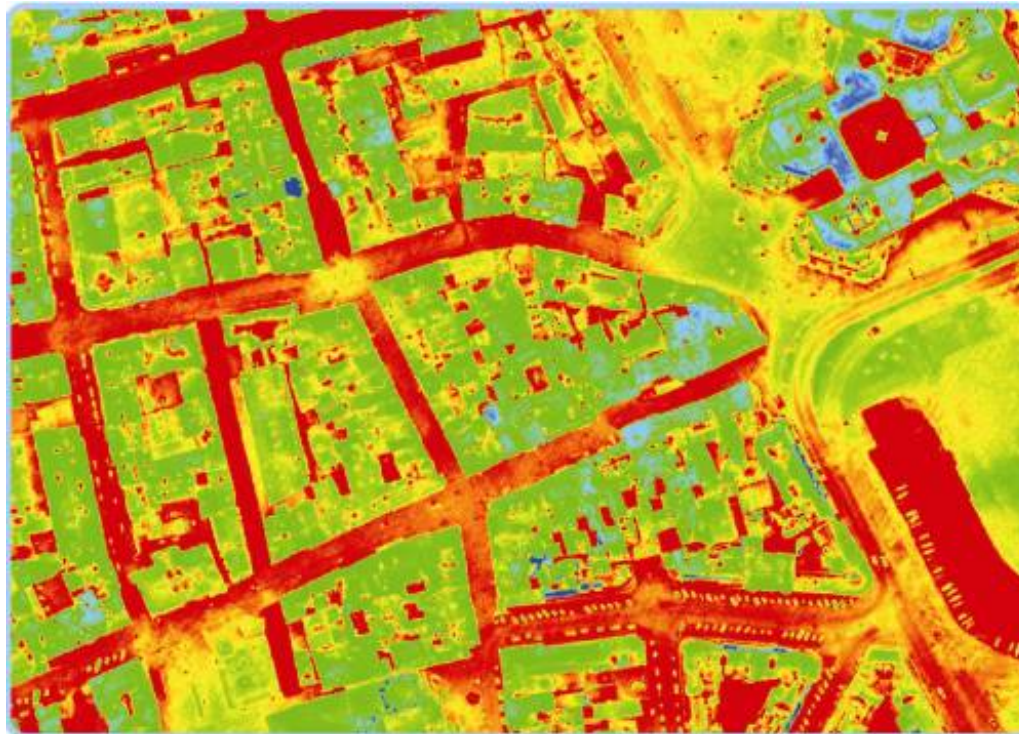


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Rapid Data Collection



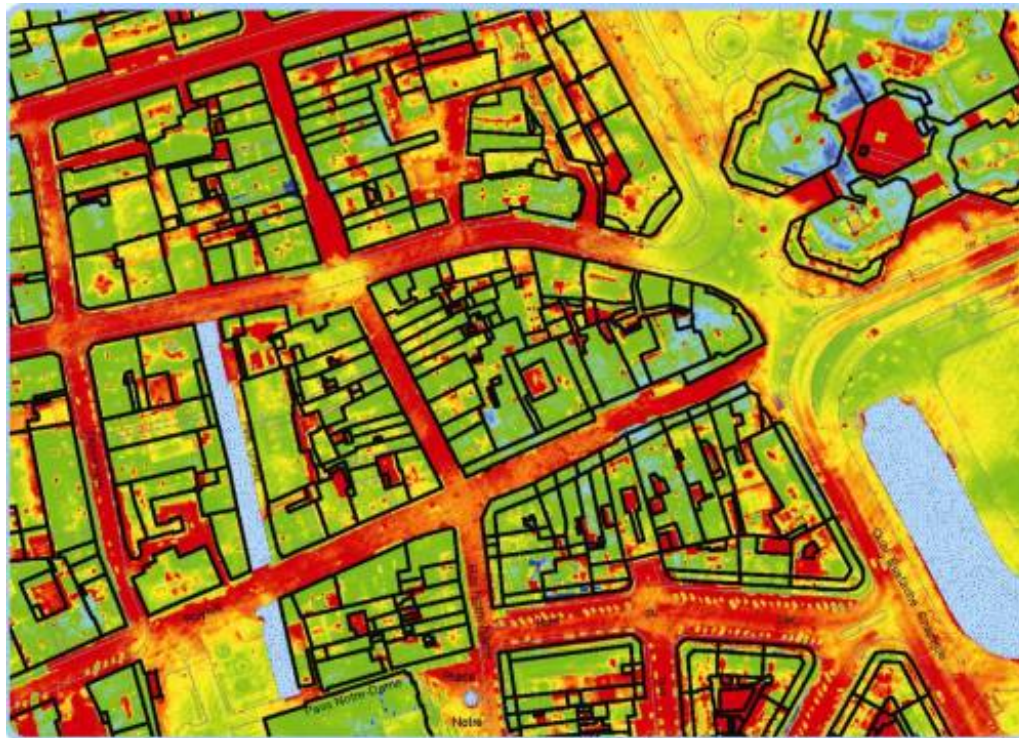
- The thermal values recorded can be converted into temperature and integrated with mapping. This identifies the heat loss from every building and piece of land

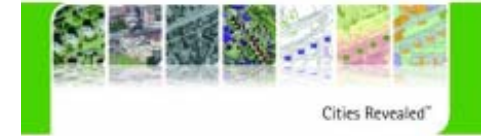


Integration with Mapping



- The thermal values recorded can be converted into temperature and integrated with mapping. This identifies the heat loss from every building and piece of land

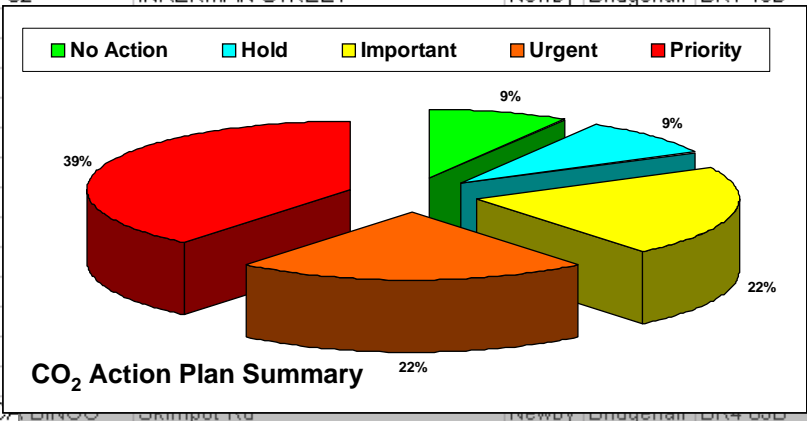




Carbon Emission Database

- An integrated database is produced containing address information, with CO₂ emissions, temperature values, building type, use and age.

NLPG UPRN	House No	Street Address	Area	Locality	Postcode	Heat Loss	CO2	Useage	Age	Type	Action Plan
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100081178976	CIVIC CENTRE	Market Square	Newby	Bridgehall	BR1 1TG	4	Orange	Government			Urgent



Deliverables



1. Digital thermal images of the authority area
2. Heat loss analysis layer (each building colour coded based on heat loss)
3. Carbon emission database, including
 - Address of each property
 - Heat loss value
 - Carbon emission
 - Building use (retail, government, residential, warehouse)
 - Building age and structural type (residential only)
4. One days technical training on the use of the thermal images including an open workshop for any council or authority member.

All data will be provide in format ready for use with major GIS programmes



Benefits



1. Consistent and realistic CO₂ Audit
2. Demonstration of your green credentials
3. Green health check for your organisation
4. Baseline picture of energy loss
5. Complete area coverage
6. Low carbon emission footprint survey
7. Property level database
8. Ease of integration with existing systems



Next steps



- To find out more about our Carbon Audit programme or to request a demonstration please contact
- Dr Alun Jones
- The GeoInformation Group
- Telford House
- Cow Lane
- Fulbourn CB21 5HB
- T 01223 88 00 77
- e: alunj@citiesrevealed.com



“Tackling climate change: local planning for a global crisis” A white paper entitled is available from www.citiesrevealed.com or by writing to Dr Alun Jones, alunj@citiesrevealed.com



Appendix 1

CO₂ Emission Calculation



- Just a 2 degree reduction in office temperature¹ can save 4 tonnes of CO₂ per year, or enough to fill a hot air balloon.
- A standard office heated to 20°C can use up to 169,875 kwh of gas for heating and hot water
- If the outside air temperature is 5°C and the building temperature is 22°C this gives a 15% temperature difference.
- This equates to 26,134 kwh of energy which is equal to 4.99 tones of CO₂
- $20\text{ }^{\circ}\text{C} = 226,500\text{ kWh} = 226,500 \times 0.191\text{ kWh/kg CO}_2 = 43,261\text{ kgCO} = 43.261\text{ tonnes}$
- 75% used for heating = 32.446 tonnes
- **2 °C drop = 4.991 tonnes = 15%**

¹ A standard off 1,500m floor space, heated to 20°C and 75% used for heating and hot water

Source: Energy Savings Trust



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Appendix 2

Climate Change Targets



- UK Climate Change Bill 2008 commits the UK to reducing its carbon emissions by 60% by 2050.
- Local Government will be measured on its carbon reduction and climate change planning through National Performance Indicators:
 - **NI 185**
 - CO2 reduction from Local Authority operations
 - **NI 186**
 - Per capita CO2 emissions in the LA area
 - **NI 187**
 - Tackling fuel poverty – people receiving income based benefits living in homes with a low energy efficiency rating
 - **NI 188**
 - Adapting to climate change

