SUSTAINABLE ASSESSMENTS
QUANTIFYING QUALITY
The Real ‘Real World’

Look around the “Real World” is comprehensively f****d

David Fleming writes, “Localisation stands, at best, at the limits of practical possibility, but it has the decisive argument in its favour that there will be no alternative.”

‘Transition Handbook’

Paul murrain ACNU 2010
Spatial Integration. Connecting space
Natural movement of the human species
Hamlow Town Expansion 25,000 dwellings.

Deformed wheels at every scale in order to push the energy to and through the centres. Your beloved public transport doesn’t make this less necessary it makes it more so.
Towards Carbon Neutral
Neighbourhood SUDS System
Aquaflo paving in conjunction with tarmac road surfaces
Tanked system section Aquaflo pavement with undersealing membrane

* Hydraway fin drain connected to 116mm PVC-U pipe with Formpave top hat seal

* Inbitex and SC membrane brought up to haunched Kerb and cut off flush with surface of Aquaflo blocks/slabs

Standard kerb block
Aquaflo blocks or slabs
5mm clean limestone
Upper sub-base 20-5mm stone
Forest edging
Tarmac construction
Concrete haunching face on all haunching must be smooth
Lower sub-base 63-10mm stone
SC intergrid
Optional SC intergrid
Inbitex
SC membrane

mm
80/60
50
100
250

Highway Agency type 1 sub-base
Telki FBRS 800 m³/day Municipal Sewage Treatment Plant, Engineered and Built by Korte Organica.
What does the GreenPrint cover?

Usually the following 8 topics:

• **Climate Change** - Ensures developments are appropriately adapted to the impacts of present and future climate change

• **Resources** - Promotes the sustainable use of resources including water, materials and waste both in construction and operation

• **Transport** - Ensures transport hierarchy issues are fully addressed and catered for within the development

• **Ecology** - Ensures the ecological value of the site is conserved and enhanced

• **Business** - Ensures that the development contributes to the sustainable economic vitality of the local area and region

• **Community** - Ensures the development supports a vibrant, diverse and inclusive community which integrates with surrounding communities

• **Placemaking** - Ensures the design process, layout structure and form provide a development that is appropriate to the local context

• **Buildings** - Ensures that the design of individual buildings does not undermine the sustainability of the overall development
What does the GreenPrint produce?

“Good”, “Very Good” and “Excellent” benchmarks achieved by the developer

Performance achieved in each category

Total GreenPrint score for the development

Overall GreenPrint Rating for the development

- **No grade:** <50%
- **Good:** 50% – 64%
- **Very Good:** 65% – 74%
- **Excellent:** 75% – 84%
- **Exemplar:** >84%

*Note: a GreenPrint is created for each development BRE are asked to assess. Therefore the score shown is the percentage of the total score available within the Framework developed for a particular site.*
### CLIMATE CHANGE - ADAPTATION, MITIGATION AND ENERGY

- **1.1 (1) Reducing the Risk of Flooding**
- **1.1 (2) Reducing the Impact if Flooding Occurs**
- **1.1 (3) Extreme Weather Events**
- **1.2 Sustainable Urban Drainage Systems (SUDS)**
- **1.3 (1) Mechanical Ventilation and Cooling**
- **1.3 (2) Passive Ventilation and Cooling**
- **1.3 (3) Energy Efficiency in Dwellings**
- **1.3 (4) Provision of Energy Efficient Street Lighting**
- **1.4 Planting Schemes and Climate Change**
- **1.5 (1) Water Efficiency Measures in Buildings**
- **1.5 (2) Rainwater Harvesting**
- **1.5 (3) Grey Water Recycling**
- **1.6 Carbon Neutral Developments**
- **1.7 (1) Integration of Solar Thermal / PV Technologies**
- **1.7 (2) Future Proofing for Use of Active Solar Technologies**
- **1.8 Provision of Sustainable Heating Techniques**

### SUSTAINABLE CONSTRUCTION AND PROCUREMENT

- **2.1 (1) EcoHomes Standard**
- **2.1 (2) BREEAM Standard**
- **2.2 (1) Low Impact Building Materials**
- **2.2 (2) Use of Timber for Building Materials**
- **2.3 Use of Locally Sourced Bulk Construction Materials**
- **2.4 (1) Use of Reclaimed and Recycled Materials in Bulk Building Materials**
- **2.4 (2) Locally Reclaimed or Recycled Materials in External Hard Surfaces Construction**
- **2.5 (1) Site Waste Management Plan**
- **2.5 (2) Waste Removed per Dwelling**
- **2.5 (3) Construction Waste Diverted from Landfill**
- **2.6 (1) Reducing Energy Use during Construction**
- **2.6 (2) Reducing Water Use during Construction**
- **2.7 (1) Improving the Local Construction Industry Skills Base**
- **2.7 (2) Environmental Impacts from Construction Operatives During Construction**
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3.4 HEALTH AND WELL-BEING 43

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4.5 (3) LOCAL CHARACTER AND IDENTITY 52
4.6 (1) ACCESS TO OPEN GREEN SPACE 53
4.6 (2) ACCESS TO PLAY SPACE AND OUTDOOR SOCIAL SPACES 54
4.7 ENERGY EFFICIENT LIGHTING DESIGN 54
4.8 DENSITY 55
4.9 (1) ADAPTABILITY IN DESIGN OF COMMERCIAL UNITS 56
4.9 (2) MEETING CURRENT AND FUTURE HOUSING NEEDS 57
4.10 ‘SECURE BY DESIGN’ PRINCIPLES 59
You’ll never eliminate bureaucracies. We are compelled to join them. They are getting worse not better. This is their latest crutch to lean on. It is worthy. They must use it to assist us not as a stick to beat us just to show how powerful they can be. If we achieve this then by God give us the right to get on with it.
### Objective

To encourage the future use of active solar technologies where they are not initially supplied.

### Question

What percentage of the development is designed to allow retrospective installation of active solar devices such as photovoltaic and solar hot water heating (where these are not fitted initially)?

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>&lt;80%</td>
</tr>
<tr>
<td>Very Good</td>
<td>80-90%</td>
</tr>
<tr>
<td>Excellent</td>
<td>100%</td>
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</tbody>
</table>

### Benchmark achieved

Excellent

### Weighting

3

### Justification/evidence

Masterplan: Infrastructure and Utilities Strategy section - "100% of all roofs will be built to be capable of accommodating renewable energy devices".

### Sources

SPG 1.1: NON-RENEWABLE RESOURCES, 1.3: RENEWABLE ENERGY PRODUCTION
To increase the number of trees on the development for wildlife, amenity and pollution purposes.

Will the development increase the number of trees on the site (after deducting any destroyed by development)?

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Good</th>
<th>Very Good</th>
<th>Excellent</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>5%</td>
<td>5%-20%</td>
<td>≥20%</td>
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</table>

Excellent (Weighting 3)

The entire scheme will result in a net increase in the number of native trees within Sherford and it has been stated by the Landscape Architect that he believes the overall biodiversity of the site will improve markedly after the completion of the development.

Red Tree have stated that approximately 3.4ha of woody planting (hedgerows) will be lost due to the development, 10% of which includes standard trees. Within the Community Park 70 ha of new planting is expected to be planted with native broadleaved trees which will deliver a net increase in the number of trees on the site. There is therefore an approximate net increase in trees of site of 66.3ha, which is more than 20% of trees currently on site.

SPG 7.2: BIODIVERSITY
**Objective**
To reduce the overall consumption of clean water for non-potable uses.

**Question**
What percentage of the roof area of the development will be used for rainwater harvesting system?

**Benchmarks**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>100% of all communal building roofs used for rainwater harvesting.</td>
</tr>
<tr>
<td>Very Good</td>
<td>&gt;50% of the roof area of the whole development used for rainwater harvesting.</td>
</tr>
<tr>
<td>Excellent</td>
<td>80% of the roof area of the whole development used for rainwater harvesting. Additionally the water collected must be capable of being used for internal use including flushing one or more toilets within the premises.</td>
</tr>
</tbody>
</table>

**Benchmark achieved**
Very Good

**Weighting**
1

**Justification/evidence**
Masterplan: Resource Efficiency of the Built Form section - Residential Building Standards: Rainwater harvesting to be used for 80% of roofs'.
'Rainwater harvesting to be used for 80% of non-residential buildings'.

Good Practice has been awarded, because whilst a commitment to 80% of roof areas has been made there is no commitment at this stage to provide an integrated system that will allow for internal use.

**Sources**
SPG 1 4: Minimise water demand, 1.5 Conserve surface and underground water resources
Sherford – GreenPrint “Excellent”

Climate Change

• Development has been designed to reduce the contribution to flash flooding through incorporation of Sustainable Urban Drainage systems, green roofs, ponds and wetlands, and the use of permeable surfaces
• Two 1.8mW wind turbines within the 207ha Community park to generate between 32 – 41%
• A carbon sink in the form of a permanent native woodland will be planted, on approximately 70 ha of agricultural land, to help offset the balance of emissions
• 75% of buildings will be equipped with solar thermal systems and/or photovoltaic devices generating between 8 and 12% contribution
• Provision of ‘A rated’ energy and water savings appliances in all dwellings
• 80% of the roof area of the whole development used for rainwater harvesting
Sherford – GreenPrint “Excellent”

Sustainable Construction and Procurement

- All dwellings to be built to EcoHomes 'excellent' standards
- All non residential buildings to be built to BREEAM 'excellent' standards
- Low carbon targets for all buildings, exceeding new Part L and matching EST Best Practice and Advanced Practice standards
  - Phase 1 – 25% reduction on Part L
  - Phase 2 – 35% reduction on Part L
  - Phase 3 – 50% reduction on Part L
  - Phase 4 – 60% reduction on Part L
- All timber sourced from independently verified sustainable sources as recognised by the Environment Agency
- One 7 yard skip of waste per dwelling target set
Sherford – GreenPrint “Excellent”

**Community and Sustainable Lifestyles**

- Set-up of the Sherford Community Trust whose aim will be to promote “more sustainable lifestyles”, it will work with all residents/businesses in Sherford and manage many initiatives, including:
  - Car club
  - Community intranet
  - Energy advice
  - Green travel planning
  - Renewable energy and energy reduction projects
  - Sustainable food initiatives
- Development of a sustainable lifestyles pack for all residents covering issues including sustainable travel advice, energy and water efficiency, recycling and environmental technologies installed in the development and dwelling
- Measures to promote and facilitate the production of home-grown food by residents, and an Organic Community Farm and farmers market
Sherford – GreenPrint “Excellent”

**Placemaking**

- Enquiry by Design process led by The Prince’s Foundation From which Sherford Town Code has been established
- Transport and movement strategy which places the pedestrian and cyclist at the heart of the development, minimising walking distances between home, workplace, schools shops and other daily needs, whilst designing streets, such that speed limits are self-enforcing
- Height:width ratios in line with Urban Design Compendium
- Delivering ‘affordable’ homes and a mix of accommodation types and tenures to meet current and future needs, with good integration of accommodation types and affordable housing throughout development that are ‘tenure blind’
Transport

- High Quality Public Transport service at the heart of the transport and movement strategy which will run down the main street linking the three neighborhood centres and proposed park and ride facility at deep lane to Plymouth City Centre.
- 100% of dwellings within 400 metres of a bus stop providing a regular service to a local centre
- Provision of a fibre optic network throughout the site as well as a community based interactive public and private services
- 20 mph design speed across much of the development
- Provision of a Car Club with central office facility with storage parking and customer collection/return, and smart card access system
Sherford – GreenPrint “Excellent”
Sherford – GreenPrint “Excellent”

**Ecology**
- 70 ha of new woodland as part of the 207 ha Community park
- Provision of wildlife corridors through the town from the west to the east and north to the south
- Extensive planting across the development of locally occurring native deciduous and evergreen trees and shrubs
- Lakes and double planting of hedgerows
- SUDS – swales, ponds, reedbeds

**Business**
- Identification and development of priority business sectors, including clusters of related activity, and other key business sectors of sub-regional importance
- Deliver an increase in jobs and local skills base, and training opportunities to help local workers upskill
Sherford GreenPrint Rating

- Sherford achieved an “Exemplar” rating
- Overall score of 85%

<table>
<thead>
<tr>
<th>Categories</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Not Met</th>
<th>Maximum possible score</th>
<th>Actual score achieved</th>
<th>%</th>
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<tbody>
<tr>
<td>1 CLIMATE CHANGE AND ENERGY</td>
<td>10</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>14.05</td>
<td>11.44</td>
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<tr>
<td>2 SUSTAINABLE CONSTRUCTION</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>11.3</td>
<td>7.68</td>
<td>68%</td>
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<tr>
<td>3 COMMUNITY &amp; SUSTAINABLE LIFESTYLES</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>5.4</td>
<td>5.40</td>
<td>84%</td>
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<tr>
<td>4 PLACEMAKING</td>
<td>10</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>13.2</td>
<td>11.54</td>
<td>87%</td>
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<tr>
<td>5 TRANSPORT</td>
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<td>2</td>
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<td>0</td>
<td>11.35</td>
<td>10.89</td>
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</tr>
<tr>
<td>6 ECOLOGY</td>
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<td>0</td>
<td>5.65</td>
<td>5.44</td>
<td>96%</td>
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<tr>
<td>7 BUSINESS</td>
<td>2</td>
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<td>0</td>
<td>3.85</td>
<td>3.30</td>
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<td>TOTAL SCORE</td>
<td>50</td>
<td>18</td>
<td>5</td>
<td>3</td>
<td>65.30</td>
<td>55.67</td>
<td>85%</td>
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</table>
Sherford GreenPrint radar

- Climate Change and Energy
- Sustainable Construction
- Community & Sustainable Lifestyles
- Transport
- Placemaking
- Ecology
- Business
SIX GROWTH SCENARIOS

The design team found each potential growth strategy to have certain positive and negative consequences. These strategies were then formulated as 'Scenarios' to help organise public discussions at the Charrette. The growth 'Scenarios' can also be used to inform public discussions to take place at Borough and District Councils over the coming years.

1 CONTINUATION OF EXISTING TRENDS
The housing is primarily placed on smaller sites, wherever found.

This Scenario advocates the status quo, proposing that the county continue with its current approach, developing plots of all kinds as opportunity arises.

2 BROWNFIELD & GREYFIELD SITES
Some of the housing is placed on large sites previously developed or underutilised.

This Scenario advocates the development of both industrial brownfield sites and commercial car parking sites, or 'greyfields.'

3 TRANSPORT-ORIENTED DEVELOPMENT
Some of the housing is placed along transportation nodes.

This Scenario proposes the development of housing within walking distance to existing rail and bus stations. This will require the radical intensification of existing areas.

4 SETTLEMENT EXTENSIONS
Some of the housing is attached to the edges of existing settlements, on green belt land.

This Scenario proposes the distribution of new housing on the boundaries of existing settlements of all sizes, including towns, villages and hamlets.

5 SATCHELITE (GARDEN) VILLAGES
Some of the housing is assigned to new villages in proximity to existing settlements.

This Scenario envisions the development of new settlements of a small scale, some of which would provide an opportunity for farming and agriculture.

6 STAND-ALONE GARDEN CITY
The majority of the housing is assigned to a new Garden City on the rail line.

This Scenario proposes the development of one major new settlement accommodating most of the new housing, along with the supporting jobs, infrastructure and amenities.
## BRE Assessment Criteria:

### Climate
- Development should take all cost-effective measures to ensure it is appropriately adapted to present and projected climate change impacts, such as flooding and increased temperatures.

### Resources
- Development should reduce the use of resources both in construction and operation, including the current status of the land and its reuse and how waste is managed when the construction site is in operation.

### Transport
- Development should depend on the availability of transport options, walking and cycling, and public transport (bus and train).

### Ecology
- Development should ensure that biodiversity of a site is protected and enhanced wherever possible, and that links are established to surrounding ecological sites where they exist.

### Business
- Development that increases in population should be accompanied by a corresponding increase in employment opportunities in a variety of business sectors to minimize travel patterns which burden the transport infrastructure.

### Community
- Development should offer more than good quality dwellings. Residents should have community facilities that allow social gathering and communication opportunities across economic and ethnic groups.

### Place-making
- Development is related to how individuals perceive the environment around them. Good development should provide a positive sense of the location itself, which is linked to the landscape in which it sits, its history and legibility, and how the public spaces are designed.

### Buildings
- Development should improve the performance of individual buildings through technology, and by incorporating existing structures. This retains the embodied energy and materials.

### ‘Does the Scenario...?’

<table>
<thead>
<tr>
<th>SCENARIOS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tr>
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<td>2</td>
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<td>Community</td>
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<td>4</td>
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<td>Place-making</td>
<td>5</td>
<td>7</td>
<td>10</td>
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<td>12</td>
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<td>9</td>
<td>13</td>
<td>7</td>
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</tbody>
</table>

Average score %

- Climate: 77%
- Resources: 56%
- Transport: 50%
- Ecology: 73%
- Business: 79%
- Community: 71%
- Place-making: 79%
- Buildings: 69%

Ranking
- Climate: 4th
- Resources: 5th
- Transport: 6th
- Ecology: 3rd
- Business: 1st
- Community: 2nd
- Place-making: 1st
- Buildings: 2nd
Climate change

**BRE ASSESSMENT CRITERIA:**

Climate

Development should take all cost-effective measures to ensure it is appropriately adapted to present and projected climate-change impacts, such as flooding and increased temperatures.

---

**‘Does the Scenario...’**

<table>
<thead>
<tr>
<th>SCENARIOS</th>
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</tbody>
</table>
Place-making

Development is related to how individuals perceive the environment around them. Good development should provide a positive sense of the location itself, which is linked to the landscape in which it sits, its history and legibility, and how the public spaces are designed.

- a. enhance legibility and orientation within existing settlements?
- b. provide access to age-appropriate space for children and teenagers?
- c. provide access to public open space at the required distance?
- d. integrate neighbourhoods with existing ones?
- e. enhance the existing public realm?
SCENARIO 3
TRANSPORT-ORIENTED DEVELOPMENT

Transport-Oriented Developments (T.O.D.s) are located within walking distance of rail stations or bus stops. Catering to both those who work in their vicinity and those who commute out, T.O.D. can lessen the general dependence on cars.

Whilst opportunities for this sort of development exist in Hertfordshire, there are not enough suitable sites remaining to accommodate all of the housing allocation.

Although the majority of railway stations in Hertfordshire have already been developed, some stations offer the opportunity for additional residential, commercial and retail development. Amongst these are rural railway stations which could become hubs for larger settlements, and urban sites which currently include large surface car parks or other underutilised land.

Because these sites offer the ideal location for housing, they justify the demolition of existing under-utilised structures, even if it adds to the expense of development. Indeed, when developed in a balanced, pedestrian-oriented and mixed-use pattern, these sites can become both destinations in themselves and feeders to London, ultimately allowing a more efficient multi-directional commuting on the rail network as a whole.

One design challenge with these sites is that they must accommodate the parking for the on-site programme as well as for the commuters who have driven to the station.

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improves commercial performance</td>
<td>• Too few sites available</td>
</tr>
<tr>
<td>• Conserves green belt</td>
<td>• Requires compulsory purchase</td>
</tr>
<tr>
<td>• Reuses land resources</td>
<td>• Requires demolition</td>
</tr>
<tr>
<td>• Reuses existing infrastructure</td>
<td></td>
</tr>
<tr>
<td>• Intensifies transportation use</td>
<td></td>
</tr>
<tr>
<td>• Improves sense of place</td>
<td></td>
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</tbody>
</table>
Transport-oriented development (TOD) offers the opportunity to build new developments, efficiently in London, and to urban areas within the county. This study examines the environmental impacts of TODs, using case studies of TODs in London and urban areas within the county. The study highlights the importance of TODs in reducing carbon emissions and improving urban sustainability. The study also explores the potential of TODs in reducing traffic congestion and improving public transport.

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Greenprint Assessment: Scenario 3

This Scenario performs best overall in the analysis because it provides an opportunity to address problems in existing settlements and improve the quality of life in and around the New Town centres, whilst also providing new dwellings. Development in central and accessible locations provides the opportunity to strengthen existing employment opportunities. The scale of the development enables construction efficiencies. Some existing buildings and building materials can be reused in new developments.

This Scenario’s worst performance is likely to be in the ecology category because there is unlikely to be much opportunity to provide green infrastructure, and in city-centre locations may not provide additional space for managing rainwater and growing food.

The central location and proximity to existing transport facilities help reduce car dependence, and it’s new provides some critical mass for public transport improvements. Redevelopment in the New Town centres can improve pedestrian and cycle routes and generally improve connectivity to surrounding neighbourhoods. The scale of the development offers a better opportunity for well-integrated affordable housing.

**Best case:** The intensification provides small-scale employment opportunities, and integration of uses creates a “place” in its own right. Noise is carefully managed through design standards. Residents using the public transport are encouraged to walk through the development, adding to its economic sustainability. The new development is linked to existing economic and social networks. Connectivity and resource efficiency throughout the town centre are improved.

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate</td>
<td>67%</td>
<td>3rd</td>
</tr>
<tr>
<td>Resources</td>
<td>67%</td>
<td>1st</td>
</tr>
<tr>
<td>Transport</td>
<td>83%</td>
<td>3rd</td>
</tr>
<tr>
<td>Ecology</td>
<td>33%</td>
<td>5th</td>
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<tr>
<td>Business</td>
<td>78%</td>
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<tr>
<td>Community</td>
<td>67%</td>
<td>3rd</td>
</tr>
<tr>
<td>Place making</td>
<td>89%</td>
<td>1st</td>
</tr>
<tr>
<td>Buildings</td>
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</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>74%</strong></td>
<td><strong>1st</strong></td>
</tr>
</tbody>
</table>

Overall ranking: 1st