

## Workshop Report: Climate Resilience for the Scottish Built Environment

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Significant contributions were made by all of those listed in Annex One.

### 1. Key points

- Creating a Scottish built environment that is resilient to climate change requires know-how and resources, and 'an enabling framework for adaptation'.
- An enabling framework for adaptation is one in which all players are adequately informed, resourced, motivated to and rewarded by taking appropriate adaptive action.
- This report presents the views of a group of sector experts who took part in a workshop hosted by the ClimateXChange Adaptation team. The report looks at some of the steps needed to create such an environment, and presents a set of recommendations to stimulate discussion and action at policy level.

### 2. Introduction

Scotland's built environment<sup>1</sup> will face some major challenges as a result of climate change<sup>2</sup>. These include flooding, water ingress, humidity issues, and over time, an increasing risk of overheating in summer. Much of Scotland's infrastructure and buildings will require some form of adaptation in order to meet these challenges. While information is already available about the sorts of interventions and adaptations likely to be necessary, this information is not necessarily known about, used, or in some cases even wanted by many of the players in the construction and property sectors. Clearly this situation must change if Scotland is to make progress towards a climate resilience built environment.

In February 2013, the ClimateXChange Adaptation team hosted a group of built environment experts (practitioners and academics). We worked with them to identify the issues and solutions that would help deliver climate resilience through the construction and maintenance sectors. The group was asked to formulate a set of recommendations to deliver and improve climate resilience in the built environment. Contributors focused on how climate resilience of the Scottish built environment could be improved by making ***changes to the processes, skills, incentives, standards and legislation that drive maintenance, retrofit, adaptation and new build.***

Details of the group are shown in Annex 1. As noted above, their recommendations are 'process focused', and add to the range of existing and forthcoming guidance from sources such as the Royal Town Planning Institute<sup>3</sup>, the Town and Country Planning Association<sup>4</sup>, the Technology Strategy Board<sup>5</sup> and Scottish Government's forthcoming Scottish Adaptation Programme.

<sup>1</sup> Here, the term 'built environment' covers domestic, commercial and public buildings and / or infrastructure that services those buildings

<sup>2</sup> <http://www.scotland.gov.uk/Publications/2009/12/08130803/1>

<sup>3</sup> <http://www.tcpa.org.uk/pages/planning-for-climate-change-guidance-for-local-authorities-2012.html>

<sup>4</sup> [http://www.tcpa.org.uk/data/files/bd\\_cca.pdf](http://www.tcpa.org.uk/data/files/bd_cca.pdf)

<sup>5</sup> <http://www.innovateuk.org/ourstrategy/innovationplatforms/lowimpactbuilding/design-for-future-climate-report-ashx>

## Climate and sector challenges

The Scottish Government's adaptation sector action plan for the built environment<sup>6</sup> identified key direct challenges for Scotland's built environment as:

- Flooding - Pluvial and Fluvial, ground water and drainage surcharge;
- Wind-driven rain;
- Increase in frequency of intense rainfall events;
- Decrease in summer rainfall; and
- Sea level rise - Coastal erosion

Workshop attendees noted that while summer overheating was not currently a priority issue in Scotland, it should be included in the list of challenges. Summer overheating will become more of an issue in the future if not addressed now in the design for new build and retrofit/refurbishment work. Some Scottish buildings already overheat in summer.

### 3. Creating an enabling framework for adaptation

Even where sufficient data information and knowledge are available to guide adaptation in the built environment, the widespread take-up of such adaptive action will not take place unless set within an 'enabling environment'. Such a framework is critical for the success of adaptation, and both policy and industry sector leaders have important roles in creating of an enabling framework for adaptation in the built environment.

#### An enabling framework for adaptation

An enabling framework for adaptation is one in which all players are **adequately informed, resourced, motivated to and rewarded by** taking appropriate adaptive action.

**Informed:** Information and advice is available in appropriate useable forms; skills exist to make use of it

**Resourced:** Grant, loan and fiscal (e.g. tax rebate) schemes may be used to accelerate and incentivise adaptive interventions

**Motivation:** may include standards, legislation, regulation and reputation

**Reward:** may include property / asset value increase, and the avoidance of direct or indirect costs (e.g. weather damage, or professional liability)

#### Players

- Property owners (domestic, private & public)
- Construction professionals
- Building trade workers and suppliers
- Estate, asset and building managers
- Planners and developers

#### Information and resources

- Information about climate challenges, liabilities, and **solutions** is available in useable forms
- Players are aware of risks & challenges, and have the **knowledge and skills** to make informed decisions
- **Motivation and rewards**
- Legislation and regulation
- Recognition of professional and company reputation issues
- Avoidance of weather damage and cost
- Avoidance of liability costs – via insurance or professional liability

Much could be done to build on existing positive structures to create this framework for adaptation of the built environment in Scotland. The next section lists a range of issues and recommendations put forward by workshop attendees. The areas addressed include sector skills, training, drivers, incentives, the need to make a convincing business case, and current industry norms. All of these have the potential either to support and drive adaptive action and resilience, or to act as barriers to adaptation if not properly addressed. Many of the workshop group expressed an interest in seeing such ideas developed and indicated that they would be willing to provide further input if this was seen as useful.

<sup>6</sup> <http://goo.gl/Sa0P9>

## 4. Issues and recommendations for an enabling framework for adaptation

### A: Promote a culture of building maintenance and associated sector skills and knowledge

- 85% of Scotland's current building stock will still be in use in 2050. Provide appropriate maintenance, along with climate-appropriate detailing are essential to avoid weather damage. This will require a robust framework of information, incentives, regulation and training for all those who play a part in building maintenance – ranging from residents, owners, suppliers, professional and trade workers, estate managers, property factors and so on.
- Scottish home and property owners may need support (and even incentives) to rediscover a **culture of building maintenance**. It appears that the tradition and practice of maintenance is in decline, with homeowners preferring to spend money on interior upgrades (e.g. kitchens/bathrooms) rather than exterior maintenance.
- To enable and increase investment in good quality maintenance by home owners, the general public needs access to **the right advice, information, support, skills and technologies**.
- To support appropriate maintenance investment in the public and private sectors, building factors, and the facilities and asset managers also need improved climate awareness along with access to **the right advice, information, skills, training and technologies** in order to make the business case for action, and to commission and invest appropriately. This should be set in an appropriate regulatory environment.
- Adaptation of buildings through the use of appropriate detailing is contingent on practitioners (including mid-career professionals and those working in the building trades) possessing the relevant **skills, knowledge and motivation**. Many of these players may not be up to date with current climate thinking nor the approaches, innovations and technologies available. Therefore skills and training for the sector is essential for all those involved in refurbishment and maintenance.
- Climate resilient design, innovation and technology should be incentivised and supported.

### *Recommendations:*

1. Invest in programmes that encourage and enable all (domestic, public and commercial) property owners and managers to undertake and understand the business case for building adaptation.
2. Invest in information, education, support, regulation and incentives to encourage home owners, landlords and all property owners and managers to assess the business case for maintenance and to invest in appropriate maintenance for property.
3. Support and incentivise training for sector professionals (e.g. architects, engineers, planners and developers) to ensure that maintenance / refurbishment (and new build) schemes deliver and improve climate resilience.
4. Support, regulate, incentivise and monitor training for building trades workers and small businesses to ensure that their maintenance and refurbishment work results in an increase in climate resilience.
5. Support, regulate and incentivise training for estate, facilities and asset managers and factors to ensure that the maintenance and refurbishment activity they commission results in an increase in climate resilience as well as improved building and energy performance.
6. An update of the regulations that cover multi-residential (especially tenement) property in Scotland is needed so that such regulations properly support occupants wishing to maintain their buildings<sup>7</sup>.
7. Explore the benefits of establishing minimum professional standards of knowledge, skills, and experience for building managers (ie tenement factors) - a sector that is largely unregulated at present.

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<sup>7</sup> For example, it may be worth considering an amendment to the Tenement (Scotland) Act 2004 that would strengthen the support provided to diligent occupants who wish to undertake repairs in the face of indifference amongst other co-owners. It might also be worth considering a further step, to support an intention to introduce actual improvements (as opposed to straightforward repairs) to strengthen the resilience of a tenement against a particular climate change risk.

8. Explore the benefits of placing a new duty on building managers (tenement factors), requiring them to provide advice to occupants, and programmes of maintenance and improvement that create resource efficiency and climate resilience benefits<sup>8</sup>
9. Explore the possibility of *incentivising building maintenance and climate adaptation regimes*. One approach would be through the insurance sector (e.g. proof of appropriate adaptation and maintenance work could earn insurance rebates for building owners). This could be achieved through an annual building check-up or 'MOT' for buildings in order to qualify for a preferential insurance rate. It could also be a pre-condition for re-insurance following a weather-related claim.

## **B: Update planning, legislation, incentives, penalties and standards**

- Some important standards and drivers of building form and specification may not take account of climate projections, and therefore may not be fit for purpose – for example British Standards, and the methods used to assess building energy usage, including the Standard Assessment Procedure (SAP), and the Simplified Building Energy Model (SBEM).
- Planning is pivotal to minimising future flood risk. However, the current system is not able to influence adaptation / settlement at the spatial scale required. In the long term, there may be a need for the managed retreat of large numbers of people, assets and infrastructure (e.g. power stations) from areas at risk from sea level rise and increased storm surges.
- Certification from the National House Building Council (NHBC) has a big influence on the sector. However, not all of the NHBC's standards are appropriate in every case, and this has the potential to act as a limiting factor for adaptive design. This should be addressed and it would be useful to examine how the NHBC might become a more positive player in setting climate- adapted standards for new build.
- Likewise, it would be valuable to explore how BBA certification (British Board of Agrément) could be an enabling force, rather than being a potential barrier to constructive innovation (due to cost and time barriers).
- To prevent adaptation resulting in designs that work counter to mitigation efforts, it would be helpful to create an incentive framework that rewarded (positive) passive design and resisted or penalised excess use of energy and carbon intensive kit. Engineers' fees may be based on how much kit is installed – this acts as a perverse incentive and drives design the wrong way.

### ***Recommendations:***

10. Establish and promote climate-related performance standards.
11. Building standards should be set so as to anticipate the performance levels needed to cope with future changes to climate, rather than set just on existing and past climate data.
12. British Standards should be also reviewed and updated to ensure they are 'fit for purpose' to deal with the demands that the changing climate will bring.
13. Explore how other industry benchmarks might be modified so as to drive climate-appropriate design.
14. Liability for climate-change related building and planning failure: Clarification is required as to who would hold liability for climate-change related building failure (planning departments, architects or developers - ie where does the buck stop?) What are the implications for Professional Indemnity Insurance? What is the current position re Case Law?

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<sup>8</sup> Note that the recent Property Factors Act 2011 focuses mainly on issues of financial probity rather than on building maintenance, knowledge and skills.

## C: Baselines, data, tools and evaluation of building performance

- Useable tools and standards that are fit-for-purpose are essential – tools that translate future climate trends and their implications into forms that are useable by the industry. For example, climate data are not easily used by the industry. There is a need to translate complex Met Office and design tools data into forms that can be easily used by practitioners.
- Current performance and baseline data would be useful. **Post Occupancy Evaluation (POE)** is essential for this – to understand actual building performance when subject to occupant behaviour<sup>9</sup> (note that modelling building performance does not provide this).
- Services that are now seen as vital for a resilient future (like POE), should be included as “core” services in the model “scopes of service” that are published by professional institutes (e.g. RIBA and CIBSE)<sup>10</sup>.

### Recommendations:

15. Identify and promote accessible, user-friendly tools and design aids that translate complex climate projection data and its design implications into forms that can be easily used by practitioners.
16. Implement the recommendation of the Sullivan Report, to make it a requirement to undertake POE of both new build and refurbishment programmes.<sup>11</sup> (Though there are issues around incentives and who pays).
17. Insist on Operational Ratings (of building performance) instead of or in addition to asset ratings and performance models.
18. Enable access to relevant performance data: Investigate the potential to open up access to data from utility companies and from the National Energy Efficiency Data (NEED) framework (set up by DECC) so that ‘real’ building performance can be better evaluated (particularly energy data, but water may also be relevant in some areas). Identify any barriers to open access to this data and explore how they could be overcome. Assess the benefits of such data access for adaptation strategy and action.
19. Enable access to relevant insurance data: Investigate the potential to open up access to relevant data from insurance companies (e.g. costs of re-instatement following storm building damage, water damage and so on). Identify any barriers to open access to this data and explore how they could be overcome. Assess the benefits of such data access for adaptation strategy and action.
20. Assess the benefit of using the above data from utilities and insurers to model the costs of inaction. This could be used to assess the cost/benefit profile of various adaptation and resilience interventions for home owners, councils and the insurance sector itself.

## 5. Conclusion

The every-day operating conditions and framework through which the built environment is conceived, planned, altered and maintained will have a powerful influence on the success of adaptive action and design for resilience. This framework includes industry and worker norms and incentives, workforce knowledge and skills, sector regulation and standards, grant and fiscal structures, and the cultural norms, knowledge and capabilities of property owners and householders. It will be necessary to address and influence all of these factors in order to maximise the take-up of adaptive action in the built environment. The recommendations put forward in this paper are intended to provide a starting point for discussions as to how this might be taken forward.

<sup>9</sup> Actual performance data is important to ensure that proposed adaptation solutions do not run counter to carbon mitigation efforts, for example in the arena of thermal comfort.

<sup>10</sup> Currently, if a service is not in the standard scope as a core service then it will not be priced routinely with a fee proposal, and there is a disincentive to pricing these in times of austerity.

<sup>11</sup> <http://www.scotland.gov.uk/Resource/Doc/217736/0092637.pdf> A Low Carbon Building Standards Strategy for Scotland (The Sullivan Report). See the first two recommendations of section 1, page 8

## Annex I: Workshop contributors

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Contributions were also provided by Roger Street of ARCC, who was wished to take part but was unable to attend in person.

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*To find out more about this workshop, including the recommendations made, please contact the organisers:*

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