Energy Efficiency in Buildings

Update on Standards development and “Each Home Counts”

14.00-14.45

Chair: Clare Price, BSI

Peter Rickaby, BSI Retrofit Task Group
Dr Jason Palmer, National Energy Foundation
Energy Efficiency in Buildings

Agenda

1. Clare Price  
   Each Home Counts Implementation Update

2. Peter Rickaby  
   An outline of Retrofit Standards Framework

3. Jason Palmer  
   Review of Retrofit Standards: Research project

4. Questions
EACH HOME COUNTS
Implementation Phase

Clare Price
Co-lead Standards work stream
Introduction

• Independent Review of Consumer Protection, Advice, Standards and Enforcement for Energy Efficiency and Renewable Energy installations for existing UK Housing

• Report published 16 December 2016

• Howard Porter, BEAMA took over as Chair of Review Implementation Board in February 2017

• Implementation event held 12 July to update on progress - over 100 stakeholders
High level recommendations in the report

A New Quality Mark

which shows compliance with...

Code of Conduct | Codes of Practice | Consumer Charter

also:

**Advice:** a central *advice portal* and property-level *data warehouse* to advise consumers

**Redress:** a single *point of contact* for consumers

**Skills:** *stronger skills requirements* covering technical and consumer facing competencies

**Governance:** industry-led organisation providing governance and overseeing compliance, backed by strong sanctions for non-compliance (including removal of the quality mark)
Principles for implementation: 80% industry, 20% Government

Market driver requirements - Private investors, social housing, ECO

Implementation progress:

Quality mark: Model developed, shared with wider stakeholders and further refined. Model principles agreed by Implementation Board.

Code of Conduct: A draft Code of Conduct has been drafted and reviewed by Board

Code of Practice: Research and Gap analysis on standards across the sector

Info Hub/Data Warehouse: initial Hub interface developed
Next Steps

• All work streams developing detailed implementation plans

• Ongoing engagement with stakeholders –
  - email us at EachHomeCounts@beis.gov.uk or
  - register interest on the website www.eachhomecounts.com

• Implementation Board sub-groups to discuss:
  - Quality mark delivery options – report to board November
  - Financing

• Website further developed - work stream updates being added

• Accelerating work on the Data Warehouse

• Continuing to explore how future ECO and Each Home Counts can be aligned – ECO consultation due early 2018
EACH HOME COUNTS
Thank you

EachHomeCounts@beis.gov.uk
www.eachhomecounts.com

10 October 2017
An Outline of the Retrofit Standards Framework

Dr Peter Rickaby
BSI Retrofit Standards Task Group
Version H, 9 October 2017
Each Home Counts

**Stands**
- Retrofit Consumer Charter
- Retrofit Code of Conduct (behaviour)
- Retrofit Code of Practice (technical standards)
- Quality Mark (mandatory for publicly funded retrofit)

**Advice, skills, training**
- Information and Advice Hub
- Guidance
- Training

**Retrofit Process**
- Whole-House Assessment
- Design
- Installation
- Commissioning
- Handover

**Quality Assurance**
- Data Warehouse (records of all retrofit)
- QA Scheme - Enforcement
- Monitoring and Evaluation

Feedback
BSI Retrofit Standards Task Group

• **Develop a framework of retrofit standards**
  - Improve functionality and durability of buildings
  - Improve the comfort and well-being of occupants
  - Improve energy efficiency
  - Reduce environmental impact
  - Protect and enhance architectural heritage
  - Minimise the ‘performance gap’
  - Avoid unintended consequences of retrofit

• **Focus**
  - Technical characteristics of retrofit
  - Processes that are used to plan and carry out retrofit
Scope

- Assessment of buildings for retrofit
- Improving insulation and air tightness
- Improving building fabric performance and resilience
- Establishing safe dynamic moisture equilibria in buildings
- Providing or upgrading ventilation and ensuring good IAQ
- Minimising overheating risk and cooling demand
- Providing efficient and responsive services (heating, DHW, lighting)
- Providing locally generated renewable heat and power
- Providing on-site energy storage
- Installing ‘smart’ metering and monitoring to promote efficiency
- Commissioning and handover of retrofit measures
- Advising occupants on efficient and appropriate use of retrofitted buildings
- Monitoring and evaluation of retrofit, and feed-back
Principles

Focus
• Standards should focus on materials, workmanship and processes as well as installer competence
• Compliance of work should be certifiable

Accessibility
• Standards should be accessible to the whole industry, including small installers and their customers
• Publication should be online and inexpensive

Guidance
• Standards should be combined with guidance
  • See for example Irish NSAI SR54: 2014
• Clickable online expert commentary
Each Home Counts
Code of Conduct

Each Home Counts
Quality Mark

Each Home Counts
Customer Charter

Each Home Counts
Code of Practice
PAS 2035 Code of Practice for the Energy Retrofit of Buildings

Existing BSI Standards
Including PAS 2030
(updated, simplified)

New BSI standards
To fill gaps identified by NEF research

Non-BSI Standards
Existing standards, evaluated by NEF, some improved
Code of Practice for the Retrofit of Buildings

• Introduction
  • Scope and focus
  • Retrofit cultural context and technical objectives
  • Overall performance standards and constraints

• Retrofit building physics
  • The building as a system: flows of heat, moisture and air
  • Thermal comfort and internal air quality

• Approaches to retrofit
  • Whole-house retrofit v incremental measures
  • Medium-term whole-house retrofit plans
  • Retrofit strategies: Fabric first, etc
  • Retrofit at scale

• The retrofit process
  • Quality assurance: the Each Home Counts process
  • Assessment | Design | Installation | Commissioning | Handover
  • Retrofit coordination and risk management
  • Quality assurance monitoring and evaluation

• References and appendices
Code of Practice: The Retrofit Process

• Assessment
  • Context assessment | Energy audit | Whole building assessment

• Design
  • Improvement option evaluation
  • Heritage issues and statutory approvals
  • Design and specification of retrofit measures and packages
  • Interactions between measures: the *Measures Interaction Matrix*
    • Thermal bridging | Air tightness | No Insulation without Ventilation

• Installation
  • Retrofit procurement procedures and standards
  • The role of PAS 2030: installation procedures and competences
  • Briefing of contractors and installers: ‘toolbox talks’
  • Sequencing of work

• Commissioning
  • Building fabric | Building services | Renewable energy systems

• Handover
  • Handover procedures and standards
Existing BSI standards
• PAS 2030: new simplified edition
• Other standards identified by NEF research (see RSD)

Existing Non-BSI standards (see RSD)
• NIA and other fabric insulation standards
• MCS standards: renewable energy systems
• CIBSE technical standards and guidance
• HET standards (various technologies)

New BSI Standards
• Assessment of dwellings for retrofit [with accreditation bodies]
• Retrofit advice [with EHC advice and information hub]
• Thermal comfort, indoor air quality and overheating
• Air-tightness and ventilation for domestic retrofit [with BEAMA]
An Outline of the Retrofit Standards Framework

Dr Peter Rickaby
BSI Retrofit Standards Task Group
peterrickabyconsultancy@gmail.com
Review of Retrofit Standards

For the Retrofit Standards Task Group

Dr Jason Palmer  EngD BSc

National Energy Foundation
Outline

1 – Our brief

2 – What we did

3 – What we found

4 – Unanswereded questions
NEF’s brief – review standards used for retrofit

- Identify-evaluate-gap analysis
- Fabric, Services, Management (from survey to implementation and maintenance)
1 – NEF’s Brief

2 – What we did

3 – What we found

4 – Missing links
What we did

- Literature review
- Internet searching
- Create database of standards
- Three consultation workshops
- Online survey
- Telephone interviews

NEF review
Three facilitated industry consultation workshops

1. BPE Specialists
   - What standards do you use?

2. Fabric Specialists
   - What’s good about them?
   - What’s bad about them?

3. Services Specialists
   - How would you prefer to use standards?
   - How would you prefer to receive guidance?
Online survey and Interviews

Online survey
54 responses to online survey

Interviews
10 telephone interviews with installers
1 – NEF’s Brief

2 – What we did

3 – What we found

4 – Missing links
## Overview of standards

**Publication type**

- Technical guidance: 164
- Competency requirements: 99
- High level guidance: 83
- Approved Document: 20
- Review report: 8

**Type of standard**

- Technical: 298
- Competence: 88
- Process management: 13
- Other or N/a: 9
- Information management: 6

**Sector**

- Both domestic and non-domestic: 64%
- Domestic: 19%
- Non-domestic: 13%
- Not specified: 4%

**Format**

- Electronic only: 50%
- Electronic and paper: 50%
Retrofit Standards Database

Research Into Standards For Retrofit

MS Access
Graphic User Interface
559 formal/informal standards
Composition of the Database

**Standard type**
- 34% informal technical guidance
- 31% formal standards and ADs
- 35% misc - competency, scheme-supporting...

**Nature**
- 69% technical
- 16% competency
- 10% process/information management

**Target audience**
- 40% designers and specifiers
- 31% installers
- 20% O&M

**Sector**
- 65% all buildings
- 18% domestic
- 10% non-domestic

**Publisher**
- 30% BSI
- 15% CIBSE
- 8% NOS
- 7% DCLG
Industry Consultation - Structure

Two-tier mandatory/voluntary system

But leaning towards aspirational standards
More engaging, not just ‘threat of punishment’

Retrofit Standards Framework

Central point of access to retrofit standards
Overarching standard à la NSAI S.R. 54:2014
Dynamic search facilities
Links to BIM?
Improvements/re-orientating standards

Whole-building retrofit strategy

Components and interfaces
Effect on air quality
Traditional buildings

In-use performance

Outcome-focussed standards
NABERS, Energiesprong approach
Overarching in-situ testing standard (IEA Annex 58)
SMEs ‘at the coalface’

Difficult to reach / engage
Mostly use manufacturers’ guidance
Cost and resources are the main barriers to formal standards

Guidance that is comprehensive, ‘transferable’, accessible
Videos – best for practical site work
Telephone support – especially new technical areas
Non-specialists

- Consistent with Each Home Counts: put consumer at the centre
- Wikipedia entries for retrofit? Good for version control
- Free checklists accompanying technical information
1 – NEF’s Brief

2 – What we did

3 – What we found

4 – Unanswered questions
Further research

- Which insulation materials to use, when?
- Suspended floor (moisture from the ground)
- Ventilation with deep loft top ups
- Demand controlled ventilation
- Risk in retrofit works (unintended consequences)
- Evidence-based guide to the benefits of retrofit
Thank you
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www.nef.org.uk