



Skills Development for a Low Carbon World

IHBC Summer School Conference, Carlisle
21 June 2013

Rory Cullen
Head of Buildings
National Trust





Traditional Construction for a Sustainable Future

Carole Ryan



FARM AND RURAL BUILDING CONVERSIONS

*A Guide to Conservation,
Sustainability and Economy*

CAROLE RYAN



Low Carbon and Sustainability

A low-carbon economy has a minimal output of greenhouse gas emissions into the environment biosphere, but specifically refers to carbon dioxide. Emissions due to human activity are increasingly either causing or worsening climate change (Wikipedia)

Definition of **sustainable**

'able to be maintained at a certain rate or level'



Sustainability

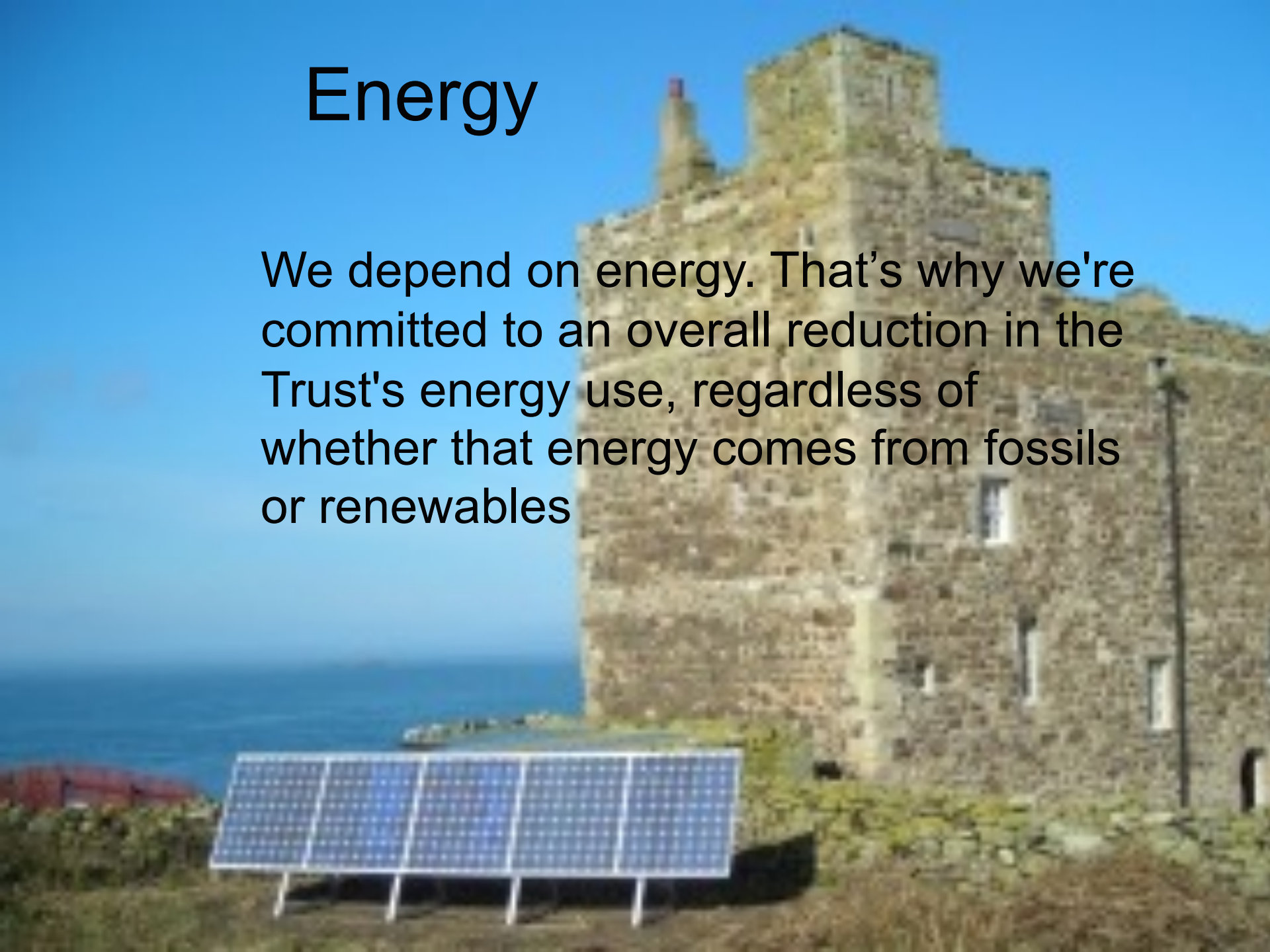
A photograph of a small, light-colored building with a gabled roof and a chimney, surrounded by trees and a fence. The building is the central focus, with a chimney on the right side of the roof. The background is filled with bare trees, suggesting a winter or late autumn setting. A wooden fence is visible in the foreground, and a paved area is in front of the building.

Our Sustainability Principles:

- Sustain the Trust - sustain our cause - sustain our assets - *forever, for everyone*
- Live frugally, enjoy life but within our (and our planet's) means
- Do as we would be done by - ethical, responsible, accountable
- Live off the interest, not off the capitals (natural, human, social, cultural, financial capital)
- Light on our feet, innovative and creative, adaptive and responsive, fit for the future, learned from the past

Energy

We depend on energy. That's why we're committed to an overall reduction in the Trust's energy use, regardless of whether that energy comes from fossils or renewables



Energy

- **Our number one priority is to promote energy saving in our everyday activities**
- **Wherever possible, we also aim to replace fossil fuels with cleaner or renewable sources such as hydro, solar and wood fuel**
- **Our wider energy strategy is about engaging with supporters, partners, communities and tenants**



Environmental Performance



We need to reduce carbon emissions by improving the environmental performance of our traditional buildings

The National Trust Approach - 'Bronze Standards'

- Low-cost, relatively unobtrusive and therefore feasible for most existing buildings
- Incorporated into buildings during repainting/ refurbishment works and short term cyclical (STC) programmes over the course of five years
- Many buildings will already have some of these measures in place

Priority 1

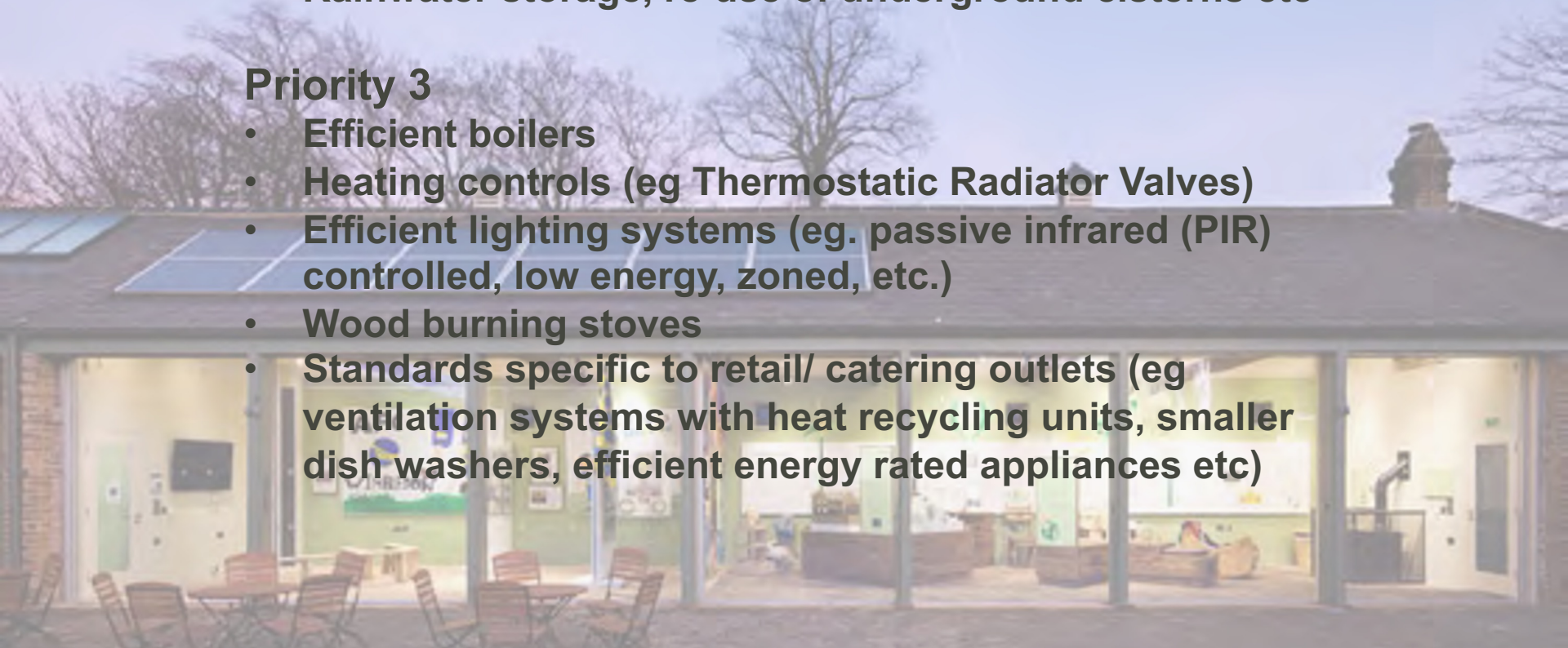
- **Maximum roof insulation**
- **Draught proofing**

Priority 2

- **Water-saving measures (eg water meters, flow controllers, leakage prevention, low-flow taps, low-volume flush cisterns, and low-water use showers)**
- **Rainwater storage, re-use of underground cisterns etc**

Priority 3

- **Efficient boilers**
- **Heating controls (eg Thermostatic Radiator Valves)**
- **Efficient lighting systems (eg. passive infrared (PIR) controlled, low energy, zoned, etc.)**
- **Wood burning stoves**
- **Standards specific to retail/ catering outlets (eg ventilation systems with heat recycling units, smaller dish washers, efficient energy rated appliances etc)**





Buscot and Coleshill

<http://www.youtube.com/watch?v=XvZcMAdCfs8>



What Skills are Needed?

Understanding Buildings is critical for:

- **Consultancy skills (Architects, Building/Quantity Surveyors, M & E etc)**
- **Craft skills**



Consultancy Skills

Gained Through:

- Knowledge and Experience
- Qualifications
- Networking/ Communications
- Continuing Professional Development

Consultancy Skills Training

3.5 Higher Education, Degrees, BAs MSc, Masters etc

Training Provider	Course Title	Training Days
Anglia Ruskin University,	Building Conservation MSC	Enquire
Architectural Association, School of Architecture, Bedford	Building Conservation PGDip	Enquire
Bath College	Stone Conservation	36 weeks Full Time
Bishop Grossetes Lincoln	Heritage Studies BA Hons	Enquire
University of Greenwich	Building Rehabilitation	Enquire
Camberwell College of Arts, London	Conservation MA	Enquire
City & Guilds of London Art School	Diploma in Architectural Stone Carving/Conservation PGDip	3 years
City and Guilds of London Art College	Wood Carving and Gilding PGDip	Enquire
Edinburgh College,	Architectural Conservation MSc	Enquire
Herriot Watt University	Building Conservation MSc/ PGDip	Enquire
Institute of Archaeology, University College London.	Principles of Conservation	Enquire
Oxford Brookes,	Historic Conservation MA/PGDip	Enquire
Portsmouth University	MSc Historic Building Conservation	Enquire
University College Dublin	Urban and Building Conservation MUBC	Enquire
University of Bath	Building Conservation MSc	Enquire
University of Birmingham and Ironbridge	Historic Environment Conservation	Enquire
University of Cambridge Institute of Continuing Education,	Building Conservation Cert H	Enquire
University of Central Lancashire	Building Conservation and Regeneration MSc	Enquire
University of Derby	Architectural Conservation	Enquire
University of Lincoln	Conservation Studies Grad Dip	Enquire
University of Northumberland	Preventative Conservation MA	Enquire
University of Plymouth	Architectural Conservation Ma	Enquire
University of Sheffield	Conservation and Regeneration.	Enquire
University of York	Conservation Studies (Historic Buildings) MA	Enquire
Weald and Downland	Building Conservation MSc/Timber Building Conservation MSc	Enquire
West Dean College	Building Conservation MA/PGDip/ Conservation Studies MA	Enquire
Weymouth College	Stone Masonry Conservation	Enquire

ConstructionSkills website:

<http://www.citb.co.uk/>

What knowledge infrastructure do we have?

Building Design Guides

[Home](#) | [About the National Trust](#) | [Contact Us](#) | [Building design guide case studies](#)

Building design guide case studies

Welcome to the Building Design Guide, a collection of case studies offering best practice and lessons learnt from a variety of building projects. This knowledge base is here to help you save time and money, by drawing attention to aspects of projects that have worked particularly well, as well as those that haven't. Please use these case studies and their related **specifications** to help inform your project planning and design.

Building projects come in all shapes and sizes, so to help you find the case study for you we have split them up into the following sections - just click on a title to find out more.

Adaptive re-use

Have you found a new use for one of your redundant buildings? Perhaps you'd be interested in reading about other examples of reuse across the Trust. The Shaft Mill at Hildon Hall, for example, was an historic mill building that required significant improvements to enhance its building facilities. This case study documents a subjective artistic discovery, plus various other project management and contractual issues encountered along the way.

Conservation

Are you thinking of restoring a glass house, or re-roofing your mansion? Our case study on the re-roofing project at Orey's Court might be of interest. The project saw a considerable success in conservation terms

Building Design Guide examples of
100

Building Specifications

- **Conservation & Conservation**
- **Buildings**
- **Architecture**
- **Architectural Practice**
- **Artists**
- **Building History**
- **Building Conservation Groups**
- **Building Conservation Grants**
- **Building Safety Groups**
- **Building Works & Jobs**
- **External Contacts**
- **Historic House**
- **Green Building Groups**
- **Building Community**
- **Plant Data**
- **Building Practice**
- **Technical Forum**
- **Green and Sustainable Buildings**
- **3D House**
- **Conservation House 2008**
- **Specialists**
- **Specialists in the**

These pages are home to a growing collection of building specifications from across the Trust. For ease of use, we have categorised the specifications alphabetically by **National Building Specification (NBS)** reference number – the index on this page gives further details of what can be found under each number. The specifications are listed in table form with the most recent additions towards the top. Each specification has been put into a standard Word document to make it easier to copy and paste information. They also contain an image relating to the particular project and a contact name should further information be required.

We hope this resource will be of benefit to Building Supervisors, Estate Managers and other Projects staff, helping to save money on consultants' fees. Please send electronic copies of new specifications to specifications@nationaltrust.org.uk so that we can continue to build this resource.

Specifications by NBS number:

- **A – Preliminaries / general conditions:** includes scaffolding and in-situ protection. See also **Standard Features**
- **B – Complete buildings / structures / walls**
- **C – Demolition / alteration / renovation:** concerning stone and timber
- **D – Groundworks and excavation**
- **E – In-situ concrete**
- **F – Masonry:** brick, masonry, stone, stone block construction
- **G – Structural:** concerning metal / steel / framing
- **H – Cladding / covering / finishing:** different wall and roofing types
- **J – Waterproofing / damp proofing**
- **L – Fixings / shoring / dry partitioning:** ceilings, flooring, partitioning
- **L – Windows / doors / stairs**
- **M – Surface finishes:** includes flooring, painting and decorating
- **N – Furniture / equipment:** covers catering, sanitary and fire
- **P – Building fabric materials:** insulation, masonry, brick, concrete
- **Q – Fencing / fencing / site furniture:** includes roads, fences and planting
- **U – Unusual systems:** design and sewage treatment
- **V – Ground anchorage:** water

Formatted Knowledge

Knowledge Capture (Templates)

Building design guide

Property name County

This should be the property name most closely associated with the building project, which is likely to either be a main house, country location or the estate.

Type of project

Tick box:

Environmental	Internal works	
Adaptive reuse	Compliance	
Landscape and external works	Conservation	
Conservation	New build	
Car park	Other (Please fill)	

Name of building or project

17 = 21 characters max. *Eg. Horse Farm, Sun Hill etc*

Case study title

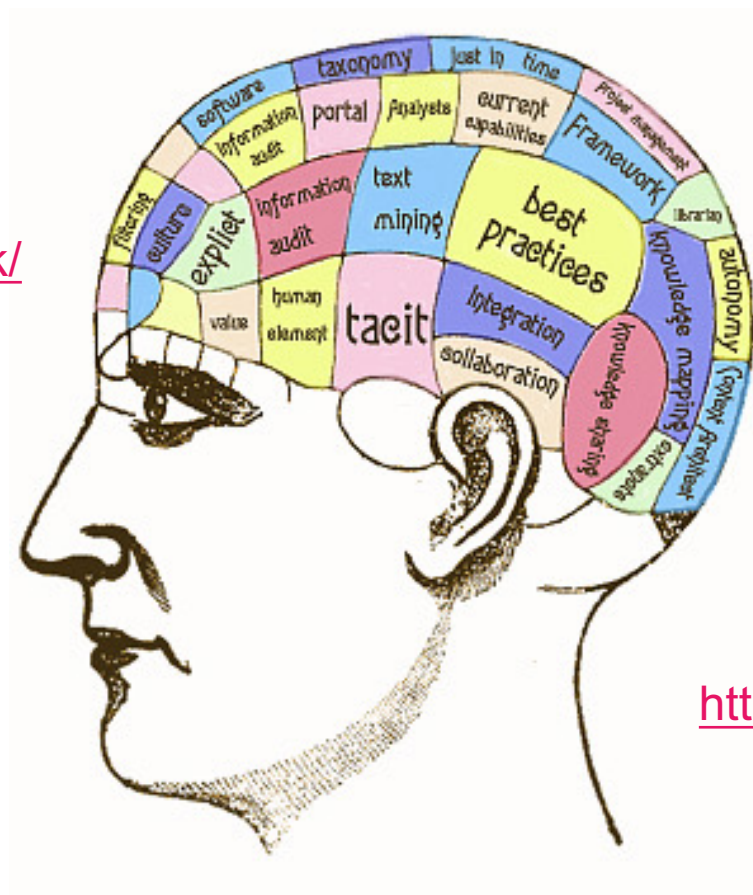
Short headline description of the project, for example: Provision of new visitor facilities



Knowledge Sharing

<http://www.historic-scotland.gov.uk/>

<http://www.spab.org.uk/>



<http://www.nhtgskills.org/>

<http://www.english-heritage.org.uk/>



Best Practice 'Retrofit'

STBA

SUSTAINABLE TRADITIONAL BUILDINGS ALLIANCE

Created to promote a better understanding and more informed approach to traditional buildings by both mainstream and heritage crafts and professions



Best Practice 'Retrofit' STBA Aims

- Identify what knowledge exists
- Assess knowledge quality
- Undertake gap analysis
- Identify actions needed to fill gaps & uplift quality
- Recommend risk analysis approach

www.retrofitbuildings.com



Caring for Places

Projects

Building design guides

[Sneak preview](#)

[Adaptive reuse](#)

[Catering](#)

[Conservation](#)

[Cottage refurbishment](#)

[Engagement](#)

[Environmental](#)

[Hub design](#)

[Landscape & external works](#)

[Lighting](#)

[New build](#)

[Visitor Receptions](#)

[Security](#)

[Sustainable technology](#)

[Technical notes](#)

[Wildlife adaptations](#)

[Standard prelims](#)

Building design guide case studies

Page owner: [Ingrid Chesher](#) Last updated: 21 May 2013

Was this page useful?



Welcome to the Building Design Guide, a collection of case studies offering best practice and lessons learnt from a variety of building projects. This knowledge base is here to help you save time and money, by drawing attention to aspects of projects that have worked particularly well, as well as those that haven't. Please use these case studies and their related **specifications** to help inform your project planning and design.

Building projects come in all shapes and sizes, so to help you find the case study for you we have split them up into the following sections - just click on a title to find out more:

Adaptive re-use

Have you found a new use for one of your redundant buildings? Perhaps you'd be interested in reading about other examples of re-use across the Trust. The Snuff Mill at Morden Hall, for example, was an historic mill building that required significant improvements to house education facilities. This case study documents a suspected anthrax discovery, plus various other project management and contractual issues encountered along the way.

Catering

Planning a new or refurbished restaurant in line with our new Commercial Strategy? Have a look at the case study for Killerton Kitchen. This project set out to be the first design-led refurbishment of a restaurant within the Trust.

Conservation

Latest case studies

[Castle Ward multi-purpose trail system](#)

What do you think?

Please take a few minutes to give us your feedback on this resource - [Building Design Guide survey](#)



Building Design Guide example / NT

Spotted a mistake?

My quicklinks

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- ➔ [Collections Management System](#)
- ➔ [e-Expenses](#)
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- ➔ [GIS Browser](#)
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- ➔ [Property System](#)
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Caring for Places

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Sustainable technology building design guides

Page owner: [Ingrid Chesher](#) Last updated: 22 Apr 2013

Are you trying to decide which type of biomass boiler to go for, or whether a heat pump would be more suitable in your location? In addition to our Environmental project case studies we have been collating feedback on different types of energy installation from around the Trust to share with you. On this page you will find case studies for projects involving biomass boilers and fuel storage, energy saving measures, heat pumps, hydro, photovoltaic and solar thermal installations and wind turbines.

Was this page useful?



Related content

[Environmental building case studies](#)
[Green projects case studies in London & South East](#)
[Minimum environmental standards for all Trust buildings](#)
[Environmental Practices Section](#)
[Wood fuel specifications](#)

Biomass boilers

Property	Key features
Calke Abbey wood chip boiler, Derbyshire (PDF 850kb)	- involved direct labour team - new build Energy Centre - two 145kW wood chip boilers (installed capacity 290kW) - below ground fuel storage bunkers
Replacing inefficient LPG-fired boilers and electrical storage heaters with a centralised renewable technology, August 2011	
Chirk Castle pellet boiler, Wrexham (PDF 370kb)	- renewable technology in Grade I listed building - modular wood pellet biomass system - supplemented by solar thermal - low maintenance requirement
Replacing the oil heating system with a low carbon equivalent, August 2009	
Coleshill Village, Oxfordshire (PDF 640kb)	- Low Carbon Village project - new heating system for Estate Office, holiday cottage and

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My people

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Environmental

Gibson Mill,
West Yorkshire



Visitor & education facilities

Renovation of a nineteenth-century mill

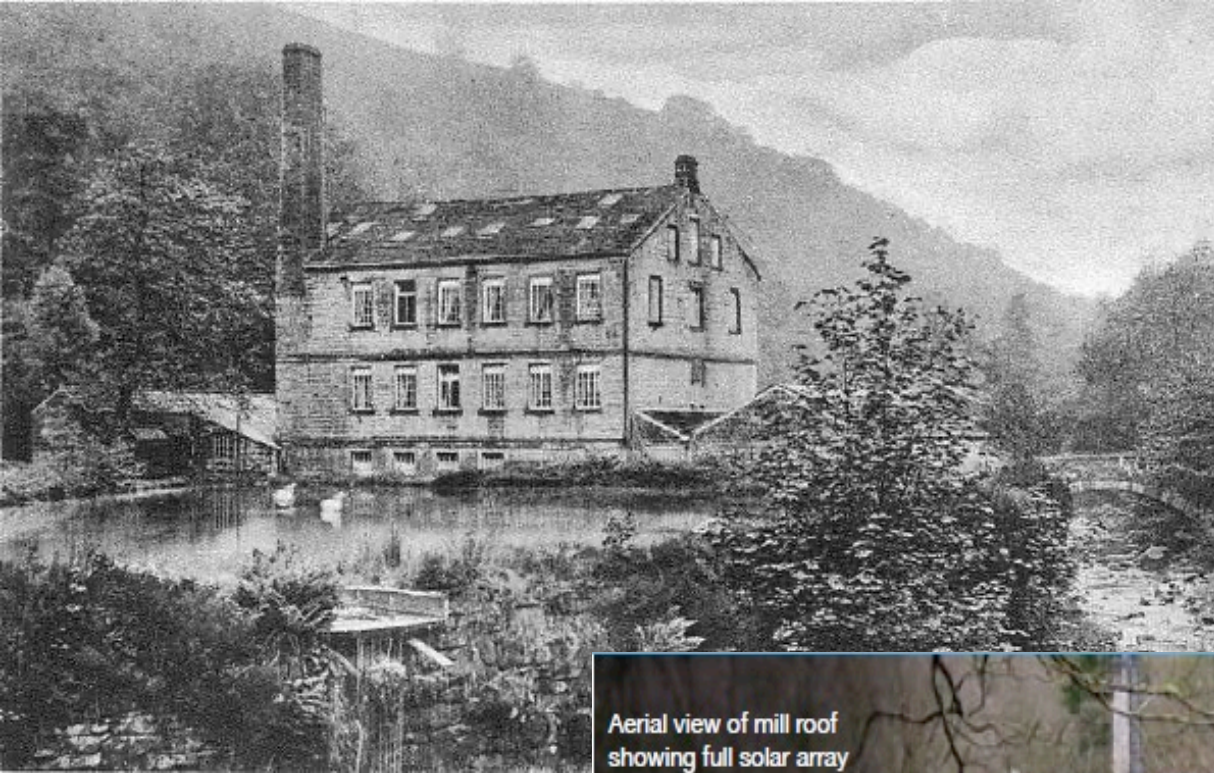
September 2005

- low carbon footprint
- local amenity
- access for all
- new technology in a traditional building
- photovoltaics
- use of natural materials



Gibson Mill

Before



Aerial view of mill roof
showing full solar array



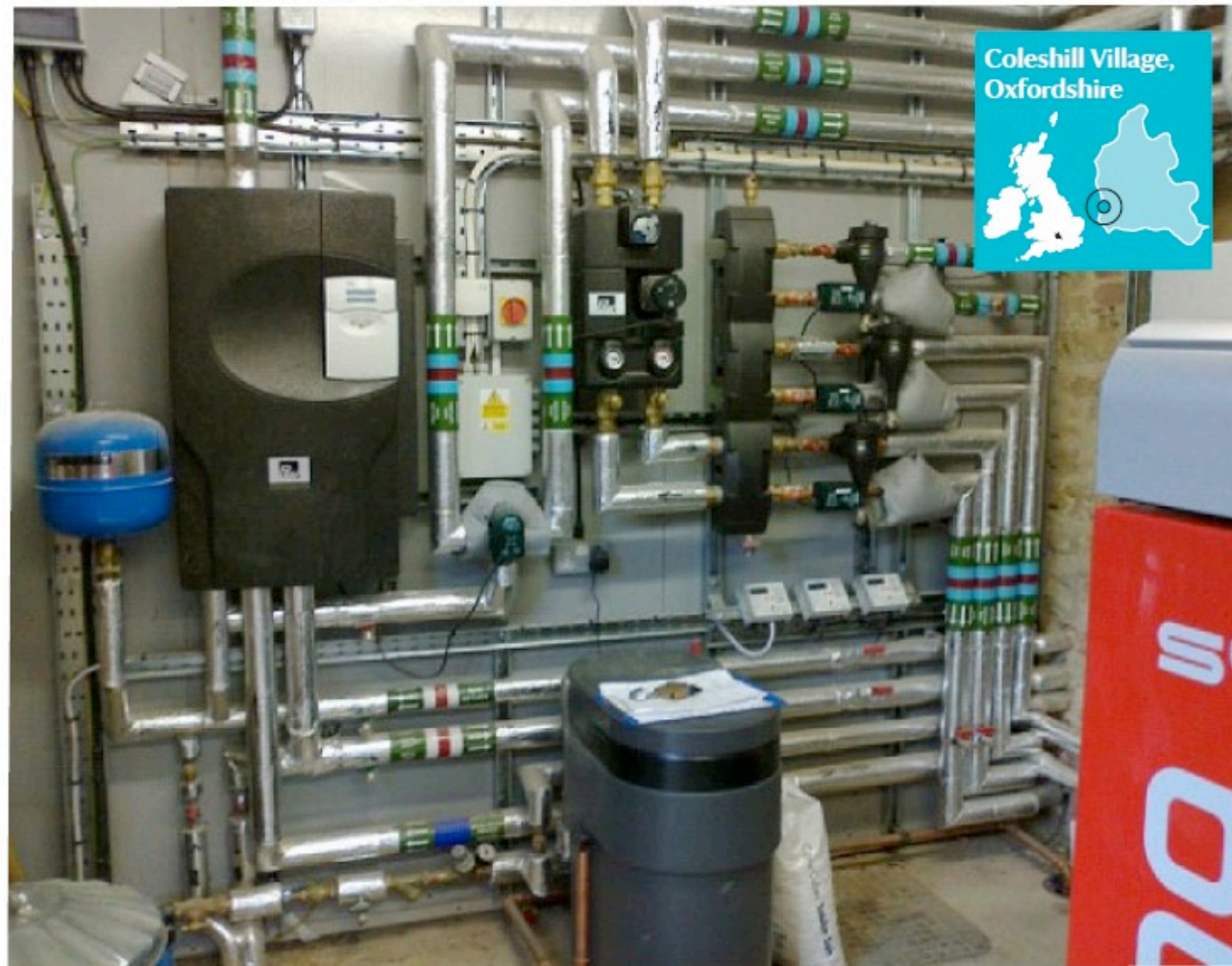
After



National
Trust

Sustainable technology case study

- replacement of three mains gas boilers
- 60kW log batch boiler with 3,150 litre thermal store
- part of Low Carbon Village project
- five Consolar Plano 27 flat plate collectors



Biomass boiler with solar thermal

New heating system for Estate Office, holiday cottage and village shop,
November 2011



National
Trust

Building design guide

- highly energy efficient historic building
- renewable energy generation including solar slates, heat pump and hydroelectric turbine
- demonstration centre testing energy efficient products
- retaining architectural integrity of original stable yard
- European partnership



Morden Hall Park,
Surrey (London
Borough of
Merton)



Heart of the Park Project

Sustainable renovation of a Victorian stable block into a new visitor centre, November 2011

Morden Hall

Test bed for multiple Green technologies

Renewable energy generation/ demonstration project including:

- **Solar slates**
- **Solar thermal panels**
- **Hydro scheme**
- **Insulation trials**
- **Green roof**
- **PV panels**
- **Air Source Heat Pump**
- **Wood burning stove**
- **Glazing trials**
- **Rainwater harvesting**

All applied to historic Victorian stable yard and buildings

theguardian

Environment

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Environment Hydropower

Hydroelectric energy creation arrives in London

Morden Hall Park is home to London's first hydroelectric turbine, costing £350,000 and generating enough energy for 18 houses

Laurie Tuffrey

guardian.co.uk, Thursday 19 July 2012 12.07 BST

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Environment

Hydropower · Energy · Renewable energy

UK news

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Why is the National Trust investing in renewables while fighting a windfarm? Chris Goodall: The trust's opposition to wind turbines outweighs its heavily publicised efforts to improve its energy performance



The 'Archimedes screw' turbine is manoeuvred into place in the River Wandle, by Morden Hall Park, south London. Photograph: Frantzesco Kangaris for the Guardian

London's first hydroelectric turbine was installed at Morden Hall Park on Wednesday – following some heavy lifting by eight workers and a crane mounted on the back of a flatbed lorry.

The National Trust estate have had the turbine, decked out in the

Today's best video



The radical Catalan nun on a mission

Sister Teresa Forcades calls for an alternative to capitalism and accuses the Catholic church of misogyny



Black bear found up tree in suburban garden

300lb bear discovered in garden in Tampa

National Trust Going Green

Fit for the Future "The way to get started is to quit talking and begin doing." Walt Disney



Category Archives: *insulation*

Insulation in a wet country with old buildings. Implications for Green Deal

Posted on [April 18, 2013](#) by [Keith Jones](#)

Earlier in the week we set up a training event for the buildings team here in Wales and few others in the little tin village hall which the NT refurbished 6 years ago at Ganllwyd in N Wales. The main ... [Continue reading →](#)

Posted in [energy efficiency](#), [insulation](#) | Tagged [efficiency](#), [external insulation](#), [Fit for the future](#), [Ganllwyd](#), [hidden hydro](#), [insulation](#), [Keith Jones](#), [National Trust](#), [National Trust Blog](#), [Paul Southall](#), [problems with insulation](#), [refurbishment project](#), [SUSREF](#), [ventilation control](#), [western climate](#) | [Leave a comment](#)



Low Carbon Challenges

Some challenges to achieve carbon reduction:

- Performance
- Issues with natural fibre insulation (eg Sheepswool)



Craft Skills



National Trust Craft Skill Issues

- Staff approaching retirement
- Loss of experience
- Skills are dying out
- Few Apprentices
- Loss of True Apprentice Scheme





Craft Skills Training

3.2 Heritage Specific Training with a duration greater than 5 days

Training Provider	Course Title	Training Days
Pro Gerard Lynch, Woburn Sands, Bedfordshire	Brick Heritage Specialist Apprenticeship	30 days
Coleg Sur Gar	Enquire	Enquire
Craven College	NVQ Diploma Heritage Brickwork, Joinery and Plastering	8 months
City of Glasgow College	Taking Care of Older Buildings	Enquire
Stone Federation Great Britain, Fountains Abbey Ripon & Woodchester Mansion South West	Stone Masonry Conservation, Specialist Apprenticeship and Upskilling	20 days 5 days
Lead Sheet Association, Kent, South East	Lead Heritage Specialist Apprenticeship	15 days also bespoke courses
Oxford and Cherwell	Restoration Introduction	5 weeks
Princes Foundation Apprenticeships	Apprenticeships	8 months
South Coast Roof Training, Little Hampton East Sussex	Roofing Heritage Specialist Apprenticeship	30 days
Flood Brothers, Kingswood, Bristol, South West	Solid and Fibrous Plastering, Heritage Specialist Apprenticeships	15 days
South Coast Roof Training	Level 3 NVQ Diploma	30 days
Society for the Protection of Ancient Buildings	Various	enquire
Society for the Protection of Ancient Buildings	William Morris Craft Fellowship (various Crafts)	9 Months
West Cheshire College	Enquire	Enquire
York College	Stone Conservation	8 weeks

ConstructionSkills website:

<http://www.citb.co.uk/>

Apprentices – the way forward



Guedelon

04.09.2011

Key Apprenticeship Requirements

- Funding
- Mentoring
- Qualifications - NVQ 3, CSCS Heritage Gold Cards
- Commitment!

04.09.2011

National Trust Apprenticeship Scheme

- 21 Apprentices recruited since September 2010 (10 in first year, 11 in second year)
- 19 still in place



Fountains Abbey Retrofit Course



Fountains Abbey Retrofit Course

In partnership with CITB-ConstructionSkills:

- **Traditional Buildings & Materials - skills, knowledge and expertise**
- **Traditional Buildings & the Principles of Repair & Maintenance**
- **Energy Use in Historic Buildings**
- **What the Building Tells Us - Research & Design for Future Use**
- **Introduction to Renewables**
- **Practical Demonstrations/ Trade Stands**

WWW.VAN-GUARD.CO.UK

Scheme Promotion

'What part can you play?'

nationaltrust.org.uk/apprenticeships



NATIONAL TRUST'S FIRST TRAINEE JOINER

Scheme Promotion

Callum McCaffrey, Apprentice Carpenter, Mount Stewart

EXCLUSIVE
By JULY HARTIS
Illustrations by GAIL

A YEAR ago Callum McCaffrey was taking picture frames in a coastal scenery workshop.

Now at just 22, he is a pivotal figure in a unique Craftium restoration project at one of the UK's most important National Trust properties.

As the first carpenter apprentice to be hired by the charity in Northern Ireland, he has proved not only young people just want to party hard and sleep late.

Callum, a primary schooler in his "green years" saying that, instead of getting excited up at the weekends to go night-fishing, he is now likely to be found in his short trousers wood and making snuff-off pieces of art.

His own father, Graham, who has been based about his passion for the wood since, but also knows his boyhood in making furniture is likely to help Northern Ireland become a better place.

And with almost half of the labour and carpenters working for the National Trust due to retire within the next few years, the charity needs more young men like Callum to take over the work.

Although he is only in the job a year, Callum has already been sent out to China on a restoration mission.

He took a few weeks and his half before he returned into the world of work and within 12 months he was working on the roof of the London-based family Mount Stewart.

Since then he has been working on part of a house gradually restoring and conserving his magnificent home.

Mount Stewart was given to the National Trust by Lady Mount Stewart in 1970 and the house remained her home until her death in November 2008.

While some repair work has been carried out in the early days of the National Trust involvement, it took in her later years Mount Lady Mount could not tolerate the numerous disruptions.

But it is now in full swing as Lady Mount's daughter Lady Rose Leeson, the current family representative, is renowned for her deep interest in the work being carried out and her watchful eye on standards.

With a failing drainage system, cracking walls, ceilings and windows, need for a new conservation building system and a total revamp, the National Trust agreed it was time to invest and stop the rot before it was too late.

And Lady Rose has found a special place in the world of the trust, a small and young group of employees endeavouring to restore her family home for generations to follow.

Callum said: "I wanted to do something for Lady Rose because I feel so privileged to be helping restore and conserve her family home."

As part of the work we had to replace wooden floorboards and joists under the floor boards in one area of the house and I managed to salvage strong good wood to make a bowl for her.

"It was a perfect little piece of 180-year-old wood."

"I thought making the bowl was a new thing to do but I wasn't disappointed but to be on happy to receive it."

"But now I understand it stands with her everywhere she goes, including her home in Venice for the winter. And I've been told she plans to bring it back to Mount Stewart for the spring and summer."

"I think there's something nice about her being able to take a bit of Mount Stewart with her on her travels and I hope the bowl will be used as a family heirloom for hundreds of years to come."

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'If I get to very old age I can come back to Mount Stewart, look at my work & say with pride: I did that'



Mount lady my age are busy partying but it just doesn't interest me
CALLUM MCCAFFREY

WOODEN SET
Covers the ceiling of one of Mount Stewart's rooms

PAISSON
Working on the splinter



HEAT WOOD
The ceiling in Mount Stewart



PHOTO BY GAIL HARTIS

will last forever and there's something special about that.

"This house to me is a living and breathing thing, a place where there has been a lot of love and fun and incredible strides in technology."

"It was the most forward-thinking house of its era and we're working on getting it back to its original splendour."

"The grounds are world-renowned and the house itself had reached a stage where it needed quite a bit of TLC."

"I was fortunate enough to get a chance at an apprenticeship with the National Trust who care for Mount Stewart now."

"I was very nervous in the interview but I was just myself and my love for this type of heritage and my goody love of wood seemed to convince them I was the man for the job."

"Most lady my age are busy partying and night-climbing, but to be honest I just doesn't interest me. I love to go out with my friends and my girlfriend but my hobby, my passion and my job are all related now and I think that makes me a pretty happy person."

The National Trust has rewarded his enthusiasm and responsibility.

Not only has Callum been awarded a coveted apprenticeship, but he has already travelled as far away as Shanghai in China to see craftsmen work and explain how they are so different to projects back home.

Callum said: "I'm just not a party animal. I enjoy myself just fine but there's more to life than just going out drinking every night."

"I have a chance to learn something special for future generations of people young and old and that makes me feel good."

Callum was allowed to get his hands on a very major part of the restoration at Mount Stewart project.

He said: "I'm the splinter man. They let me get my hands on the splinter and I think that's very exciting."

"I was people walking past the house and splintering in wonder about the craftsman who put love and care into the work."

"The original ones had been replaced by wood work and I was given the responsibility to make a prototype for the new ones, which about 10 are needed to finish the job."

"If I get to very old age I know I'll be able to come to Mount Stewart, look at my work and say with pride, 'I did that'."

I want people to wonder about the craftsman who put love and care in the work
CALLUM MCCAFFREY

Awards

Jenny Sibley - winner of the South West
heat of Dulux Decorator Centres' 2013
Apprentice of the Year competition



HLF Funded Traditional Skills Bursary Scheme (Displaced Apprentices)

- 
- A photograph of a young man and an older man sitting at a wooden table, smiling and engaged in a craft project. The young man on the left has a pencil behind his ear and is holding a white mug. The older man on the right is wearing glasses and holding a wooden mallet. They are both focused on their work, which involves wooden planks and tools.
- **£760,000 provided from HLF**
 - **20 Displaced Apprentices recruited to date (7 at National Trust estates)**
 - **Further 10 in place by January 2014 (total of 30)**
 - **45 placements in total (including short duration)**

THE TRADITIONAL BUILDING BURSARY SCHEME FOR DISPLACED APPRENTICES

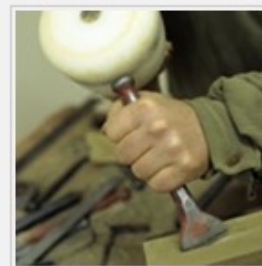
[Home](#)[About](#)[Placements](#)[Applications](#)[News](#)[Contact](#)

Location: Home



[< Previous Page](#)

Traditional Building Skills Bursary Scheme



An innovative, flexible and inclusive work-based training scheme to help displaced apprentices complete their apprenticeships, gain a vocational qualification, and develop their building skills to work on older buildings.

[> Click here to find out more.](#)



Skills/ Low Carbon – Now & in the Future

Opportunities:

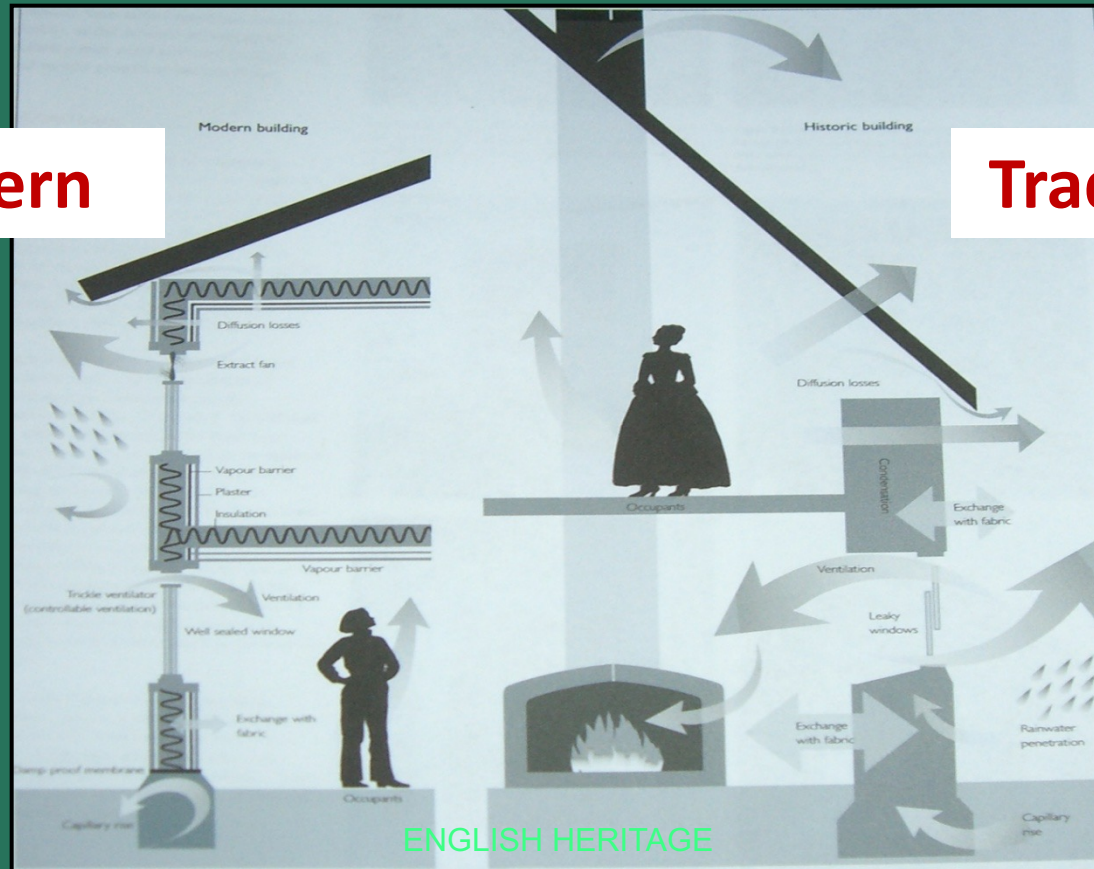
- Green Deal/ ECO (Energy Company Obligation) finance?
- Monitoring (smart metering, performance benchmarking etc)
- On site generation
- Carbon Trading

THE PROBLEM!

These buildings perform differently

Modern

Traditional



but this is not understood by most people, even Contractors



Walls – What is the Thermal Value?

Solid Walls U-Value Research by the SPAB

Solid wall (homogenous)



Wall build up

46.3% better

Lime Plaster	15
Granite	400
Cement render	13
Lime roughcast render	25
Overall	453mm

Insitu U-value **1.75** W/m²K

Build Desk U-value **2.56** W/m²K

Courtesy Caroline Rye / SPAB



Walls – What is the Thermal Value?

Walls with Cavities – Limestone & Plasterboard



Wall build up

Gypsum skim	3
Plasterboard	13
Cavity	10
Limestone (ashlar)	170
Overall	196mm

95.9% better

Insitu U-value 0.96 – 0.97 W/m²K

(Without Dry Lining = 2.0 W/m²K)

Build Desk U-value **1.90** W/m²K

Courtesy Caroline Rye / SPAB

Skills/ Low Carbon Agenda - Now & in the Future

Emerging understanding of challenges:

- Traditional building understanding – issues with ‘U’ values
- Research (BRE, STBA, EH, SPAB, Historic Scotland)
- Retention of Skills (NHTG Reports)
- ‘Retrofit’ training – short courses, National Occupational Standards (NOS)
- Accredited degrees/ Masters courses in Heritage & Sustainability