



Retrofit GreenDeal

Rev 9 %%% (with feedback)
Rewards, Rational, Rhetoric,
Restructuring, Risks & Risk Management,

This & contained presentations

- **Scribd:** www.scribd.com/brianspecman
- > collection >
- **SusCon Retrofitting**
- <http://www.scribd.com/collections/2401889/SusCon-Retrofitting>
- **Refurbishment**
- <http://www.scribd.com/collections/2426007/Refurbishment-See-also-SusCon-Retrofitting>
- **SMARTLife Hive**
- <http://www.scribd.com/collections/3311795/SMARTLife-Hive-Low-Carbon-Centre>

Advance Warning

- The GreenDeal may not even happen
- But Government has no choice
- Its written into law already
 - Climate change Act 2008
 - Energy Act 2011
- Targets have to be met
- Fines will be dished out
- The GreenDeal we end up with
 - is likely to be like this,
 - but the details may vary.

Retrofit: Rewards, Rational, Risks

Rewards

- 3000+ properties refurbished per day
- survey & design requirements
- More companies needed
- Large work force needs to be trained
 - Training of a new workforce
 - Up-skilling of existing workforce
 - No more compromises
- Long term employment to 2050
 - And probably beyond

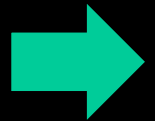
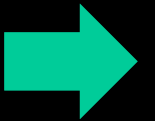
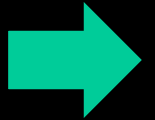
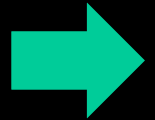
Rationale

- Drivers
 - Carbon reduction
 - for human survival on our only planet
- CRC non-domestic buildings
- Green Deal 2012
 - Financial Mechanism
 - Golden Rule
 - Delivery system
 - Supply chain
 - Competency
 - Standards
 - Training and education
 - Approved players and approved parts

Risks

- Inadequate survey
 - Using limited knowledge & guesswork
 - Bats & Birds not expected
- Lack of understanding of physics
 - Poor design & choice of materials
- Interstitial or surface condensation
 - Mould: asthma
 - Toxic mould (PII cover unavailable)
 - Death by Insulation
- Destruction of Historic Fabric

Retrofit: GreenDeal Rewards





Retrofitting Practical Toolkit for Architects

Rev 5 %%%

RIBA South/South East, SusCon,
SEEDA, ESF, BSSP; GreenSpec and ech₂o

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Another GreenSpec CPD file to download soon

See www.scribd.com/brianspecman

UK housing stock

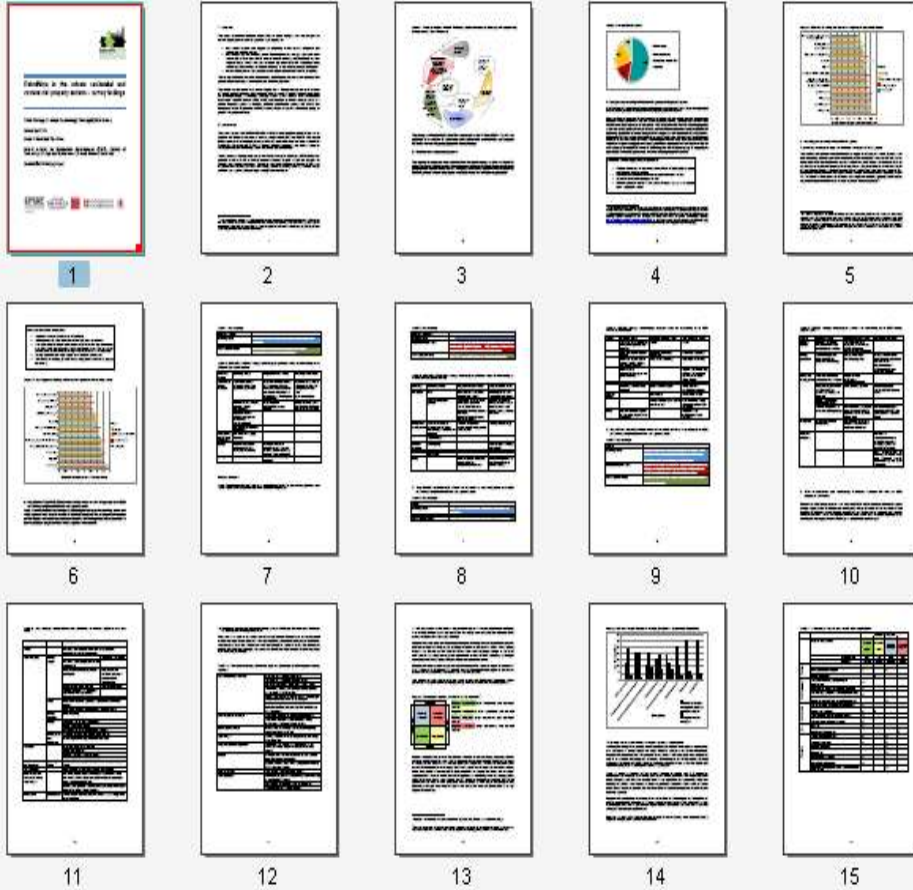
- **6.6 million properties**
 - solid walled and ‘hard to treat’
- **9.2 million properties**
 - other elements ‘hard to treat’
- **27% of carbon generated by housing**

UK Carbon Targets

- **Climate change Act 2008**
 - 34% reduction by 2020
 - 80% reduction by 2050
- **Energy Act 2011**
 - 50% reduction by 2025
 - 60% reduction by 2030
- **New milestones set in Africa Dec 2011**
- **7 m retrofits needed by 2020**
 - 80% improvements in energy efficiency needed in each of them

Delivery?

- £23 bn/annum spent on maintenance
 - Very little on energy efficiency
- 15% by 2050 at current rate of delivery
- 700,000/annum properties to upgrade
- Last year
 - 20,000 upgraded
 - And lots of exemplars and trials
 - Numerous databases of best practice
 - based on actual performance
 - not designed performance



Retrofitting in the private residential and commercial property sectors – survey findings

Work Package 2: Urban Technology Foresight (2020-2050)

November 2011

Judith Britnell and Tim Dixon

Oxford Institute for Sustainable Development (OISD), Faculty of Technology Design and Environment, Oxford Brookes University

Retrofit 2050 Working Paper



Figure 3: Barriers to rolling out the retrofit agenda in the private sector

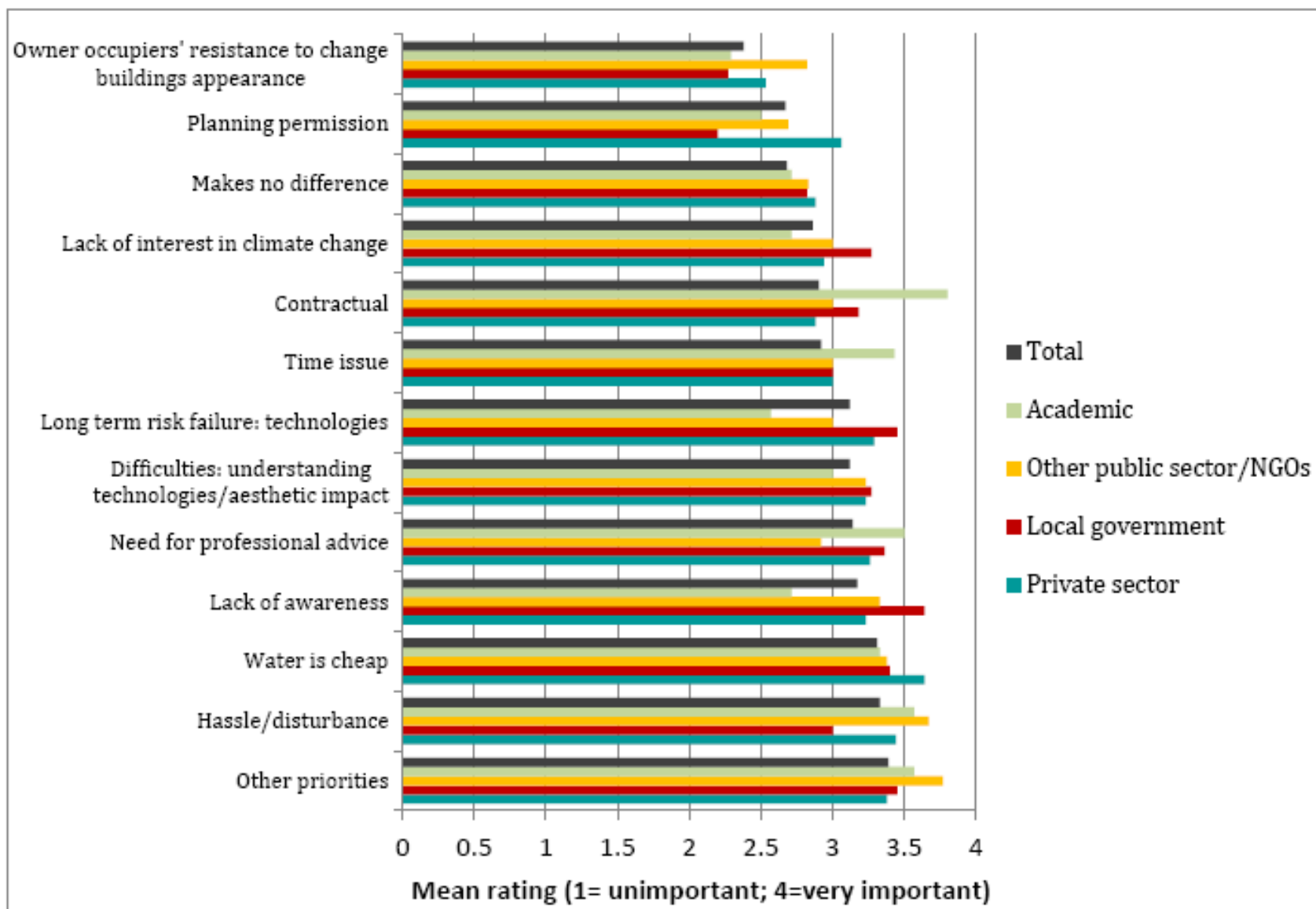
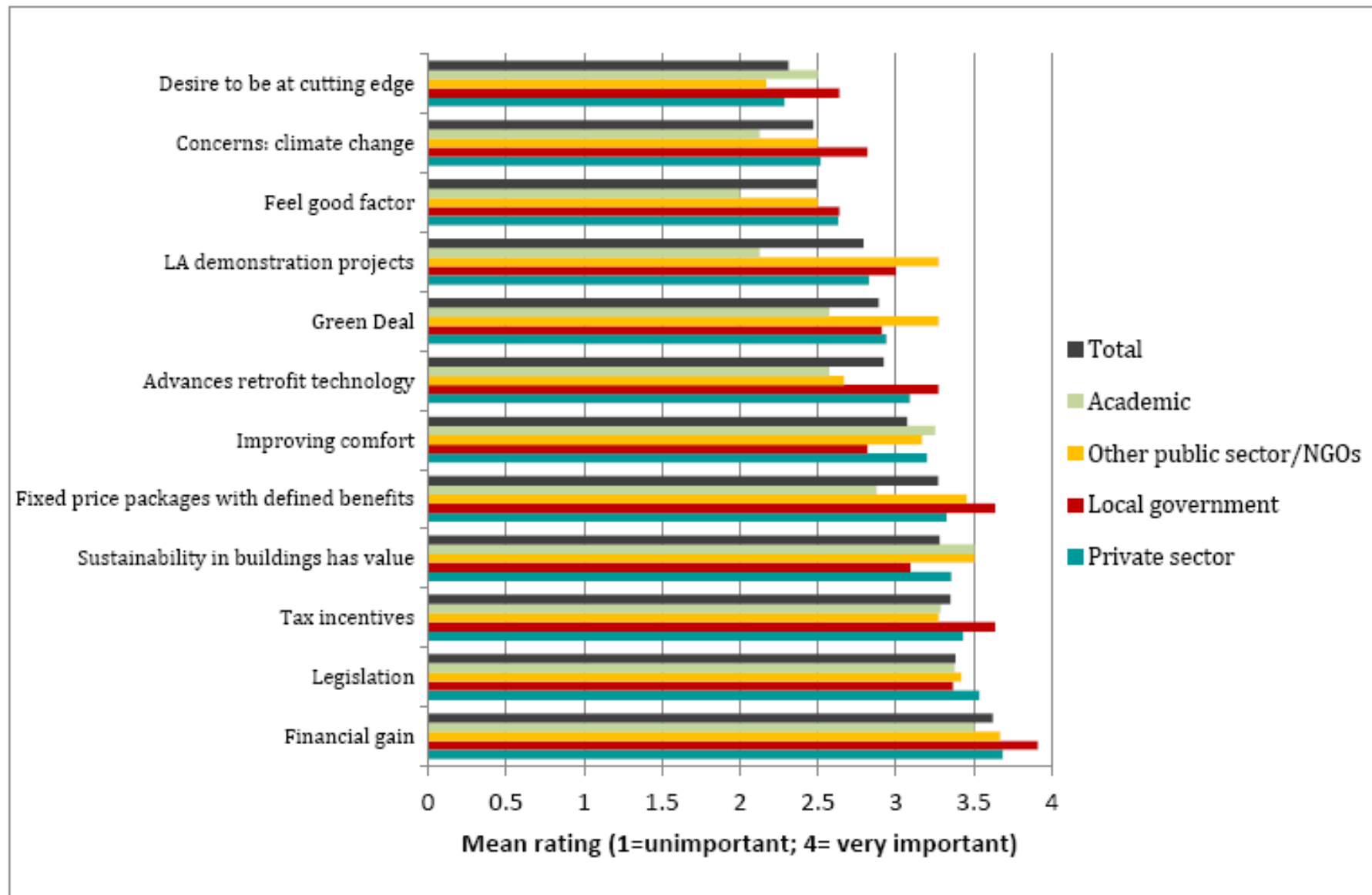
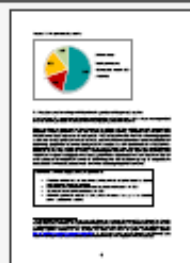
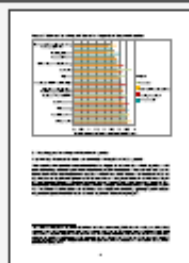


Figure 4: Key triggers to rolling out the retrofit agenda in the private sector

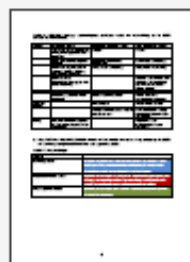




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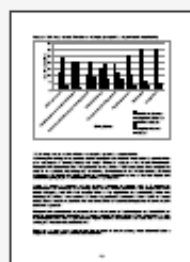
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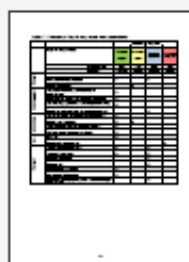
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11. 'Driving forces' for the future – respondents asked to rate predetermined examples

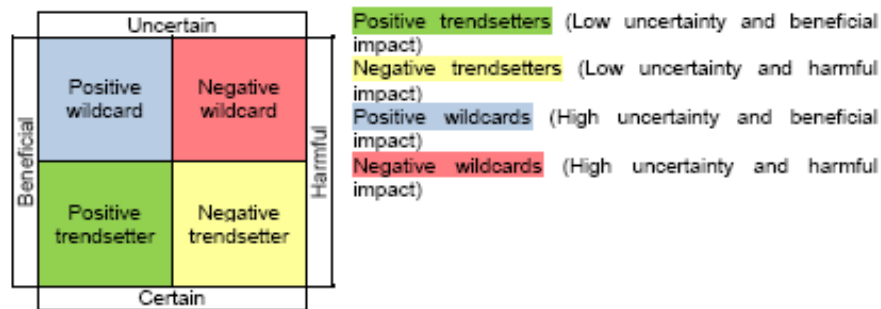
Key finding: Energy and water prices are no longer seen as uncertain because there is an acceptance that the costs will rise.

Respondents were given pre-determined examples of driving forces that could influence the success or failure of taking up the challenge to retrofit in the future to 2050. These driving forces were defined as the external factors that could influence change in the local environment e.g. energy prices, global agreements on cuts in GHG emissions, or changed values/behaviours that support climate change and carbon reduction.

Respondents were asked to rate these forces in terms of the degree of impact on a scale of -2 to +2 (where -2 is harmful, 0 is neutral, and +2 is beneficial) and degree of uncertainty (where -2 is very uncertain, 0 is neutral and +2 is very certain).

The responses were placed into four main impact and uncertainty groupings. These groupings were based on the scenario planning work by Ratcliffe and McIntosh (2001)⁴.

Figure 5: Groupings adapted from Ratcliffe and McIntosh⁴



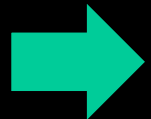
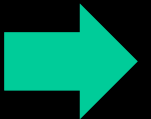
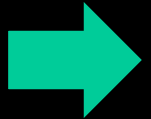
Positive wildcards and positive trendsetters dominate in the responses, indicating that the pre-determined examples were seen by respondents as predominantly 'beneficial' in terms of impact on the path to a low carbon future (see Figure 6). In terms of uncertainty the results are interesting in that energy and water prices are not seen as 'uncertain' drivers; rather, they could be considered as being important in shaping the future, but no longer 'unpredictable'. In other words, the relative certainty of increasing water and energy prices could help move us to a low carbon future⁵. Whereas respondents believed that global agreements on cuts in GHG emissions, breakthroughs in new supply technologies and behavioural change were forces/drivers in the future that were still surrounded by a high degree of uncertainty.

⁴ Ratcliffe, J. and McIntosh, A (2001) *Global Real Estate Scenarios*, Futures Academy for King Sturge

Scale of activity

- 14 million UK homes could benefit from insulation under the Green Deal.
- Potential spend: £ tens of billions
- Energy efficiency sector
 - investment confidence?
 - job opportunities? yes
 - could stimulate economic recovery?

Retrofit: GreenDeal Rhetoric



Energy Minister Chris Huhne

- "Energy saving is the cheapest way of closing the gap between demand and supply, yet it is the Cinderella of the energy ball,"
- "To date we have heard too much talk and too little action." on energy efficiency"
- "Improved energy efficiency needs to be made a desirable prospect for every householder, like broadband or satellite TV"

The Green Deal

- A completely new and ambitious approach to home insulation and energy efficiency.
- It will make it easier for householders to make improvements, without the pain of investment.
- The aim is that every participating householder will save money by insulating their home
- You wont have to choose between improved bathroom, kitchen or insulation

Fuel Poverty or Fuel Poor?

- A complimentary part of GreenDeal is aimed particularly at those living in fuel poverty or with low incomes.
- ECO Energy Company Obligation
- energy efficiency had the potential to offer real carbon-cutting gains for relatively little investment.

Joined up commerce

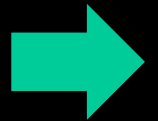
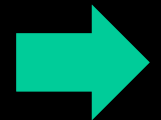
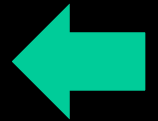
- "Energy companies and high street stores will help guide customers through a simplified process and pay for the work upfront.
- Householders will then pay back over time on their energy bills from the energy savings they make."

Joined up communities

- energy companies & local authorities
- team up to promote more efficient home refurbishment plans,
- Larger numbers leaning on economies of scale.

"Insulation measures are often cheaper if implemented a street at a time,"

**Retrofit:
GreenDeal
Rational**



The Green Deal (GD)

- UK government initiative to kick-start:
 - extreme energy efficiency refurbishment revolution
- For homeowners and businesses
 - that can afford their energy bills
- Upgrade with no up-front cost.
 - capital cost, interest charges and overheads, insurance, warranties
 - recouped over a period of time through the resulting savings on the buildings energy meter(s) bills.
- The repayments and savings remain with the building not the occupier

GD Provider

- **Package deal offered by private firms or local government**
 - E.g. B&Q, M&S, local authorities, energy companies.
- **One point of contact**
 - One contractual relationship
 - Arrange GD Accredited Assessor (survey)
 - Arrange GD Accredited Advisor (design)
 - Arrange GD Accredited Installer (fix & set)

GD Plan

- financial and contractual agreement
 - between the GD Provider and Improver
- Scope of work
 - recommended by GD Accredited Adviser
 - undertaken by GD Accredited Installer.
- Specifies the total cost,
 - the charge to be attached to the energy meter
 - length of the repayment period
 - Complying with the Golden Rule

GD Improver

- **Householder, business or organisation**
 - whose property is being improved.
 - Has one contract with the GD Provider
- **Chooses from recommended energy improvement opportunities**

GD Accredited Assessor

- On-line 8 hour training
 - On-line exam
- Assesses (Surveys) the property
- the property
 - recommends energy saving opportunities
 - from a list of GD Approved measures.
- Might also make recommendations on energy-saving behaviour
- If its too complex then pass to a GD Accredited Advisor.

GD Accredited Advisor

- Might be a Surveyor/Designer/Architect/Conservation Architect
- Assesses the property
- recommends appropriate energy saving opportunities, materials and methods
 - from a list of GD Approved measures.
- Might also make recommendations on energy-saving behaviour.

GD Approved measures

- Must save energy or generate energy
- Heat or Power
- On approved lists:
 - ECA Enhanced Capital Allowance
 - Energy Technology List Products
 - Water Technology List (hot water use)
 - MCS lists
- Known life expectancy
- Must have a payback within: lesser of
 - 20-25 year for Golden rule
 - Guarantee period of the approved measure
- Emphasis on 'Fabric first'
 - Insulation, airtightness, thermal breaks
 - EcoBling later or second choice

GD Accredited Installer

- Specialist installing the measures
 - Approved kit selected/recommended by the GD Accredited Assessor/Advisor
 - Manufacturers approved installer
 - MCS approved installer
- They could be:
 - employees of the GD Provider
 - or be an independent subcontractor.

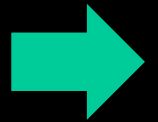
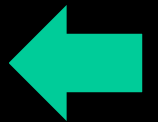
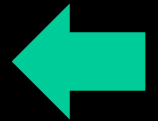
The Golden Rule

- The expected financial savings from the measures must be equal to or greater than costs attached to the energy bill
 - including: measures, labour and financing costs, insurance, warranties
- length of the payment period
 - should not exceed the expected lifetime of the measures.
 - Nominally 20-25 years
 - But correspond to kit guarantee period
- Fabric first, EcoBling second

Energy Company Obligation (ECO)

- Government driven uptake of energy efficiency measures:
 - Carbon Emissions Reductions Target (CERT)
 - Community Energy Saving Programme (CESP).
- Both expire at the end of 2012,
 - replace by ECO.
- Restructured:
 - up to date and work with Green Deal.
- The ECO focuses on households who need financial support
 - Fuel Poverty (10% of income) (>5m families)

GreenDeal Delivery Mechanism



Green Deal Code of Practice BSI PAS 2030

OFT

Office of Fair Trade

FSA

Financial Services Act

Development Control

Fiscal Incentives Barriers

Error Corrections

UKAS (approved standards)

Product Requirements

UKAS (approved standards)

Green Deal Provider Licence

Assessor /Advisor standards

Performance Specification

BSI PAS 2030

Green Deal Provider

Green Deal Assessment Surveys

Manufacturers & Approved Products

GreenDeal Installer

Manage Process

Certification Body

Manufacturer's Approved installers

Certification Body

Provide customer Service

Accredited Assessor/ Advisors

Golden Rule

Accredited Installers

Engage the GD assessors, advisors, installers

Domestic /Commercial Assessors/Surveyors

Pay for itself within 25 years or product guarantee period

Signed off installations

Guarantor

Domestic /Commercial Advisors/Designers

Product Guarantee Warranties

Installation Warranties

Professional Indemnity Insurance

Dictates the repayment period

SWIGA or CIGA



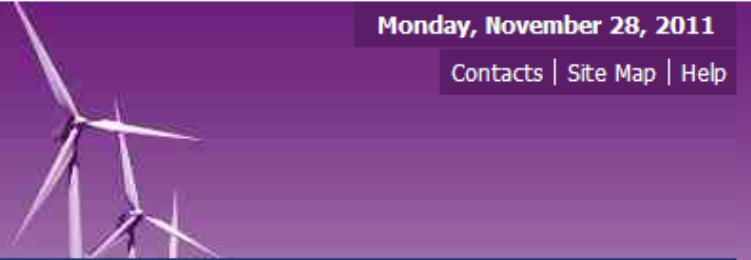
Green Deal Public Consultation

1

Another GreenSpec CPD file to download
See www.scribd.com/brianspecman

Information Hunt

- BSI cant find BSI PAS 2030
- CIBSE website
- <http://www.cibse.org/content/PAS2030Draftfordownload.pdf>



Publications | accesskey: P

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 - Action on Energy
 - Energy Efficiency Policy
 - Microgeneration
 - Potential for energy efficiency loans
 - Energy Efficiency Action Plan
 - Energy Efficiency Design Awards
 - Green Deal and ECO**

Green Deal and ECO

On Tuesday, 18 October 2011, the Energy Bill received Royal Assent and became the Energy Act 2011.

The Act includes provision for the GB-wide " **Green Deal**" which is a framework to enable private firms to offer consumers energy efficiency improvements to their homes, community spaces and businesses at **no upfront capital cost**, and recoup payments through a charge in instalments on the energy bill.

At the heart of the UK Government's proposals is the "Green Deal plan", an innovative financing mechanism which allows consumers to pay back through their energy bills. This means consumers can see the Green Deal charge alongside the reductions in energy use which generate savings on their bill.

It also means that if they move out and cease to be the bill-payer at that property, the **financial obligation doesn't move with them** but moves to the next bill payer: The charge is only paid whilst the benefits are enjoyed. In this way, the Green Deal differs from existing lending - it is not a conventional loan since the bill-payer is not liable for the full capital cost of the measures, only the charges due whilst they are the bill-payer. This is a market mechanism, funded by private capital, which is expected to deliver far more to consumers than any sort of top-down Government programme.

Alongside the Green Deal, the UK Government is planning to replace the existing energy company obligations. The new **Energy Company Obligation (ECO)** will focus energy companies on improving the ability of the vulnerable and those on lower incomes to heat their homes affordably, and on improving solid wall properties, which have not benefitted much from previous schemes.



- **Public consultation**
 - **Green Deal and the ECO**
- **Launched 23/11/2011**
- **Open until 18/01/2012**
- **full text of the consultation**
- http://www.decc.gov.uk/en/content/cms/consultations/green_deal/green_deal.aspx
- **how to respond.**
- **share views with Scottish Government**
- **EEM@scotland.gsi.gov.uk**

DECC

- http://www.decc.gov.uk/en/content/cms/tackling/green_deal/green_deal.aspx
-

- Explaining climate change
- 2050 pathways analysis
- Carbon Plan
- Smart meters
- Green Deal**
- Industry
- Customers
- Stakeholder Engagement
- Procurement process
- Oversight body
- Saving energy and CO2 in the UK
- Committee on Climate Change (CCC)
- Our international work on

GREEN DEAL

GREEN DEAL

The [Energy Act 2011](#) includes provisions for the new 'Green Deal', which intends to reduce carbon emissions cost effectively by revolutionising the energy efficiency of British properties.

The new innovative Green Deal financial mechanism eliminates the need to pay upfront for energy efficiency measures and instead provides reassurances that the cost of the measures should be covered by savings on the electricity bill.

ECO

A new Energy Company Obligation will integrate with the Green Deal, allowing supplier subsidy and Green Deal Finance to come together into one seamless offer to the consumer.



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GREEN DEAL BULLETIN

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PUBLICATIONS

- [Y Fargen Werdd a Rhwymedigaeth y Cwmnïau Ynni: Dogfen Ymgynghori](#)
- [Eight meeting of the Green Deal Collection and Remittance](#)

GreenDeal Stalling Mechanisms?

Development Control

T&C Planning
Permission

Listed Building
Consent

Building Control

Permitted
Development

Conservation
Areas

Extending part

EcoBling

Conservation
Officers

Altering part

External Insulation
Full Applications?

Postcode lottery

Requires
upgrading more

Postcode lottery

Outside/inside
insulation building
appearance

Limited scope of
interest

System already
under stress

Protective of
historic fabric

Limited scope for
judgement

Using delaying
tactics

Limited permitted
activity

Limited expertise with old
building extreme upgrades

GreenDeal etc. Fiscal Incentives

Fiscal Incentives? Or economy destroyers?

CRC

Carbon Reduction
Commitment

Big Industry Players

Government
Estate

Pay in advance for
Carbon
consumed/created

Reduce Carbon to
reclaim money

Energy efficiency

Government decides the
rewards are too
generous rules changed

ECA

Enhanced Capital
Allowance

Tax reduction
after installation

ETL

Energy
Technology List

WTL

Water
Technology List

Complex
paperwork

FIT

Feed In
Tariff

Renewable
Electricity
Generation

Money saved

Money paid back

Good ROI
Return On
Investment

Government decides the
rewards are too
generous

FIT reduced to 21p &
based in EE Certs

RHI

Renewable Heat
Incentive

Renewable Heat
Generation

Money saved

Money paid back

Good ROI
Return On
Investment

Government decides the
rewards are too
generous?

Keep an eye on the news

GreenDeal etc. Fiscal Incentives Or Barriers?

Fiscal Incentives? v economic recovery barriers?

CRC

Carbon Reduction Commitment

Big Industry Players

Government Estate

Pay in advance for Carbon consumed/created

Reduce Carbon to reclaim money

Energy efficiency

Government decides the rewards are too generous

ECA

Enhanced Capital Allowance

Tax reduction after installation

ETL

Energy Technology List

WTL

Water Technology List

Complex paperwork

FIT

Feed In Tariff

Renewable Electricity Generation

Money saved

Money paid back

Good ROI Return On Investment

Government decides the rewards are too generous

FIT reduced to 21p & based in EE Certs

RHI

Renewable Heat Incentive

Renewable Heat Generation

Money saved

Money paid back

Good ROI Return On Investment

Government decides the rewards are too generous?

Keep an eye on the news

VAT

New Build 0%

RMI +20%

Refurbishment +20%

Retrofit +20%

Energy saving +20%

Carbon Reduction +20%

Low carbon Materials +20%

Post-GreenDeal Salvage Mission?

Picking up the pieces when it all goes wrong

Environmental Health Officer

Moisture penetration

Condensation & Spores

Mould starts growing

Asthma becomes prevalent

Toxic mould

Toxic buildings

Toxic waste

EHO & BCO

Moisture rising in walls

Damp penetration

Embedded timber

High moisture content

Dry rot or wet rot

Timber failure

Floor collapses

Building Control Officer

Frost action on cold walls

Brick and stone frost damage

Mortar frost damage

Unstable brickwork

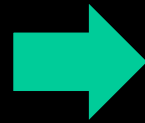
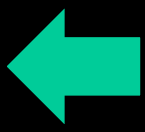
Unstable walls

Unstable structures

Condemned buildings

Follow Up: Restructuring

Aspire to become
what you
desire to appear



GreenDeal Ready

- **GreenDeal Tender Ready**
- **PQQ Pre Qualification Questionnaires**
 - Download a copy now
 - Be able to complete them now
- **Business Link website**
 - Download policy templates
 - Edit to your business
 - File safely now
 - A good days work now
 - means you won't rush later

THE BUSINESS MAP

www.bizmapeast.co.uk



Operations People Finance Sales Start-up Growth Environment



Business Link

- www.bizmapwast.co.uk
- Download the Templates
 - Environmental Policy
 - Employment Policy
 - Health & Safety Policy
 - Etc.
- and edit to suit your business

Follow up: education and training institutions

- RMI Repair Maintenance Improvement
- NB New Build
- Construction Industry Economy
 - 40% RMI v 60% NB
 - GD will push the % further towards RMI
- Trade Training:
 - 0% RMI v 100% New Build
- Professional Education:
 - 0% RMI v 100% New Build
- Training must reflect reality
 - Training uptake must reflect workload

Follow Up: manufacturer/suppliers

- Understand your products better than you do
 - BSI KM, BBA Cert, ETA, Euro Agrément
 - GreenSpec PASS
 - LCA & EPD:
 - GreenSpec EPD
- Understand your company better than you do
 - ISO 9000 QA
 - ISO 14001 EMAS
 - BES 6001 Responsible Sourcing
- GD Approved
 - BSI PAS 2030 (Public consultation over?)
 - GD & ECO (Public consultation now)
 - Measures or Materials
 - MCS Approved products
 - ECA: WTL or ETL
 - Manufacturer Approved Installer system

Follow up: Provider/Contractors

- Know your company better than you do
 - ISO 9000
 - ISO 14001
 - BES 6001 Responsible Sourcing
 - Subcontractor review
 - Manufacturer's Approved installers
 - MCS Approved Installer
 - GD Approved Installers
- Green Deal Tender Ready
 - BSI PAS 2030 (Public consultation over?)
 - GD & ECO (Public consultation now)
 - Scrutinise the details
 - Challenge Green Deal if found wanting
 - GreenDeal Provider status
 - Sector schemes investigate and join them
- New skills: add to core skill
 - Customer development
 - Customer management
 - Decanting people, possessions and extraction surveys
 - Reestablishment of customers and possessions into premises
 - Expectation management



Retrofit: Diversification of Business

Discussion Pod: From New-Build to Retrofit
ICE Retrofit Solutions 17-18 May 2011
www.ice-retrofitsolutions.com

Another GreenSpec CPD file to download
See www.scribd.com/brianspecman

Great Offering

- **Package Deal?**
 - All disturbance hassle: removed
 - T&C Planning, BRegs, others?
 - Utilities
 - changes if any,
 - autonomy is possible
- **Holiday whilst work is carried out**
 - Return to find everything in its place
 - Finishes, Furniture and Possessions
- **Not just energy measure**
 - Water, waste, power, communications, controls, monitors and meters

Follow Up: Installers

- Know your company better than you do
 - ISO 9000
 - ISO 14001
 - Manufacturer's Approved installers
 - BES 6001 Responsible Sourcing
- Green Deal Tender Ready
 - BSI PAS 2030 (Public consultation over?)
 - GD & ECO (Public consultation now)
 - Scrutinise the details
 - Challenge Green Deal if found wanting
 - GreenDeal Approved Installer status
 - MCS Approved Installer
 - Sector schemes investigate and join them
- Multi-skilling: add to core skill
 - thermal insulation
 - airtightness
 - thermal bridge elimination

Follow up: Surveyors/Designers

- Know your company better than you do
 - ISO 9000
 - ISO 14001
- Re-educate yourselves
 - Get training in hydrothermal software
 - Find the right answers
 - No Death by Mould
 - No Destruction by Insulation
 - Specify the right stuff by the right installers
- Green Deal Ready
 - BSI PAS 2030 (Public consultation over?)
 - GD & ECO (Public consultation now)
 - Scrutinise the details
 - Challenge Green Deal if found wanting
 - Become a Green Deal Approved Assessor/Advisor
- Team up: Surveyors & Designers
 - Choose well and trust each other

Retrofit: GreenDeal Opportunities



Refurbishment Surveys, Tests & Analysis

1

Another GreenSpec CPD file to download
See www.scribd.com/brianspecman

Opportunities

- **Competent, accurate, thorough surveys**
- **Testing of existing**
 - Airtightness, IR Thermography
- **Thorough understanding of the existing**
 - Analysis of all survey information
 - Software analysis
- **Design the proposal**
 - Appropriate approach:
 - Methods, materials & technology
- **Whole House Plan: Final state**
 - Phased development or room by room

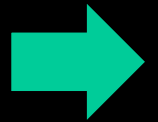
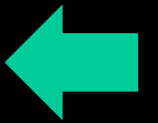
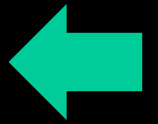
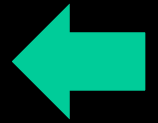
90 minute Fit-Out

- TSB Technology Strategy Board
 - Retrofit for a Future competition entry
- Project Solution
 - Space survey: IR Scan > 3D survey
 - 3D CAD model
 - 3D CAD design of linings to fit space
 - & minimise waste from standard boards
 - CAD/CAM file > CAM cutting machine
 - CAM cut to suit panels > Space
 - Fit out room in 90 minutes, no errors
- All delivered in a shipping container

Current Research

- **Cambridge University**
 - & Insulation Supplier/installer
 - Walls: cavity v solid, materials, linings, etc.
- **Buildings surveyed, assumptions made**
 - Logistics prepare kit, materials, labour
- **Arrive to carry out work**
 - Assumptions found wanting
- **Have wrong kit, materials, labour**
 - Aborted work, time wasted,
- **Better surveys to avoid repeats**
 - Better survey kit and analysis software

Retrofit: GreenDeal Risks



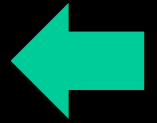


Retrofit GreenDeal

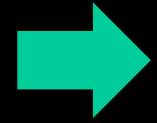
Rewards, Rational, Rhetoric,
Restructuring, **Risks & Risk Management,**

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Retrofit:



GreenDeal



Risk Management

Delegate's Proposal and my reactions

- Risk Management:
 - Go ahead with unproven solutions
 - but monitor and inspect
 - Inspection access compromises integrity
 - Go ahead but make it undoable
 - Like EA's Sacrificial Construction in flood plains
 - Don't do it to too many
 - Too many to correct if it goes wrong
 - People have to live in your experiments
 - and put up with your error correcting exercises
 - Do many different experiments
 - to a few buildings at a time
 - Do understood, designed, competent things to many buildings at the same time

Retrofit GreenDeal

Rev 9 %%% (with feedback)
Rewards, Rational, Rhetoric,
Restructuring, Risks & Risk Management,

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