

Workshop 1D

Driving Retrofit Quality:

Each Home Counts and PAS 2035

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Chaired by: Andrew Burke

Room: Norfolk



NHMF
Maintenance
Conference
2020

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Each Home Counts

An Independent Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy



Dr Peter Bonfield, OBE, FRIEng




Department for
Business, Energy
& Industrial Strategy


Department for
Communities and
Local Government

December 2016

Industry-led review

- Sponsored by BEIS and MHCLG
- Led by Peter Bonfield (BRE)
- Multiple work-streams
- Hundreds of people involved

Twenty-seven recommendations

- Consumer protection
- Advice and guidance
- Quality and standards
- Skills and Training
- Compliance and Enforcement
- Insulation and building fabric
- Smart meters
- Home energy technologies

Implementation

- Coordinated by a cross-industry Implementation Board
- BEIS support > £2 million

Each Home Counts

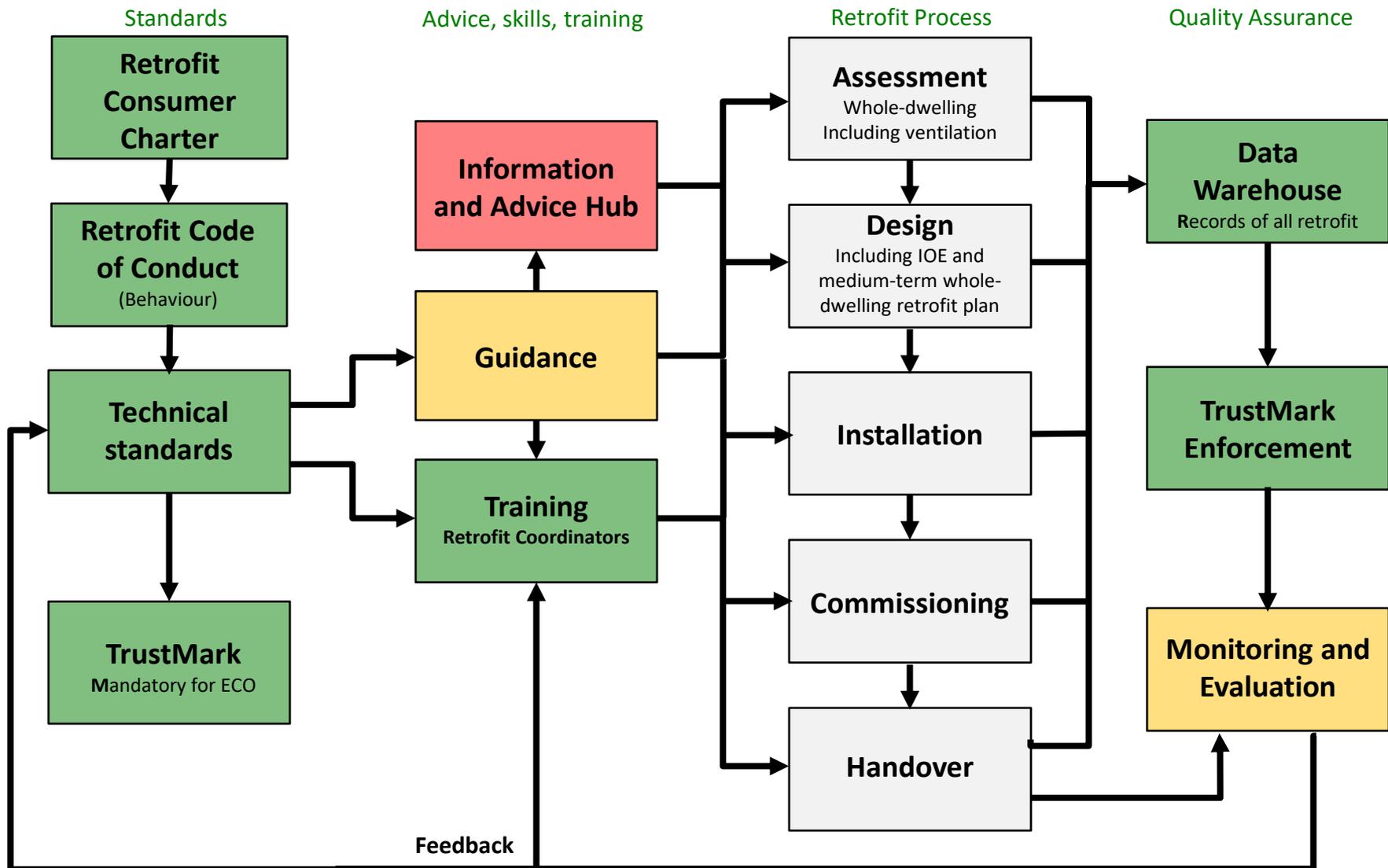
Twin strategic objectives

- Boost demand for energy efficiency from consumers and the public sector by restoring trust in the industry
 - By Government and the public
- Reduce risks to finance bodies, to encourage funding
 - Based on the assumption that there are private investors looking to increase their lending to the sector

Implicit objective

- Encourage consolidation of the industry
 - Move away from fragmented, measures-based retrofit and adopt a whole-dwelling approach

Each Home Counts *Progress 2019*



BSI Retrofit Standards Task Group

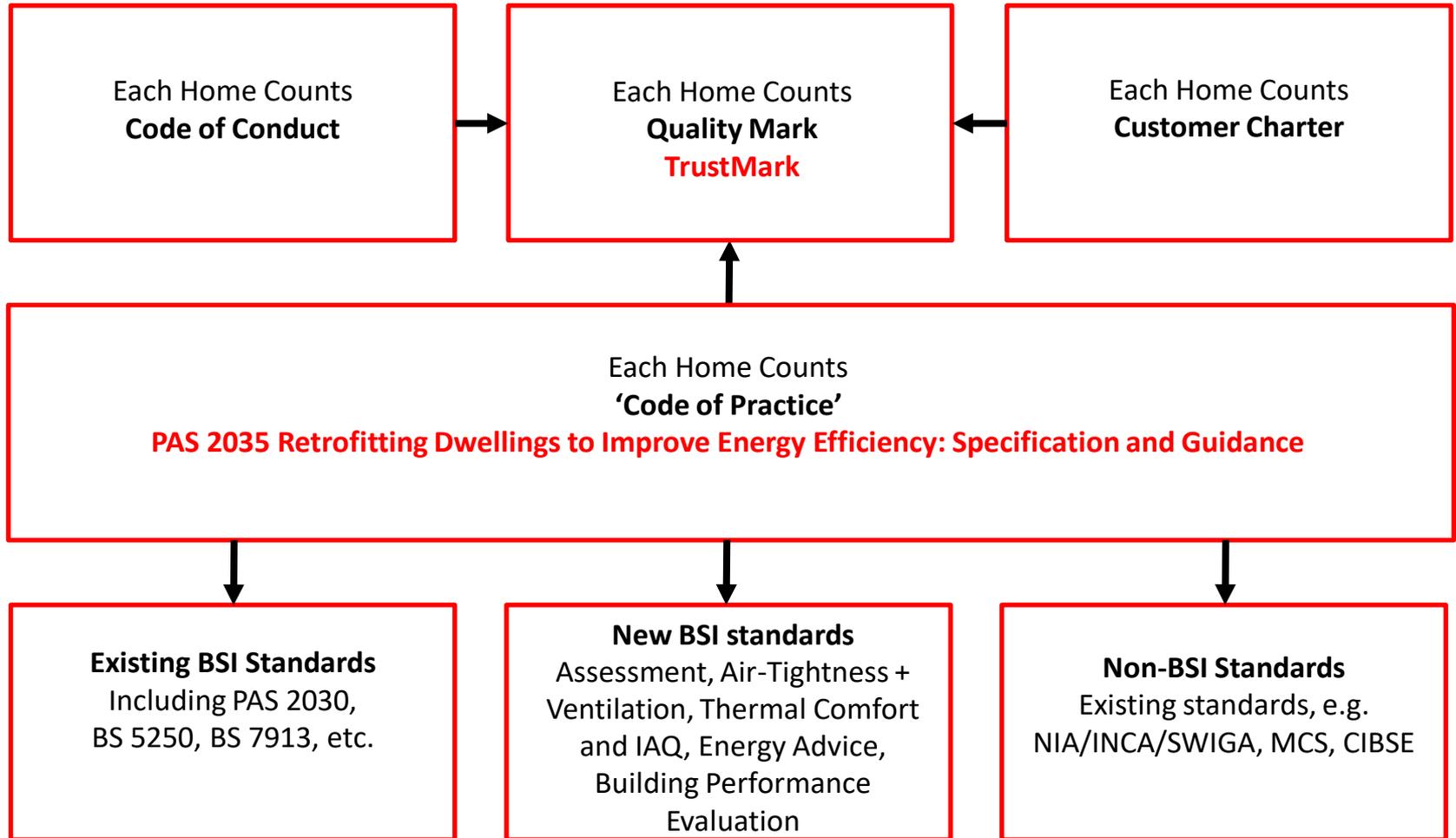
Objectives

- 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

Principles

- Focus on *outcomes*, not certification of organisations
- Make retrofit standards accessible (online portal)
- Combine technical standards with guidance

The BSI Retrofit Standards Framework



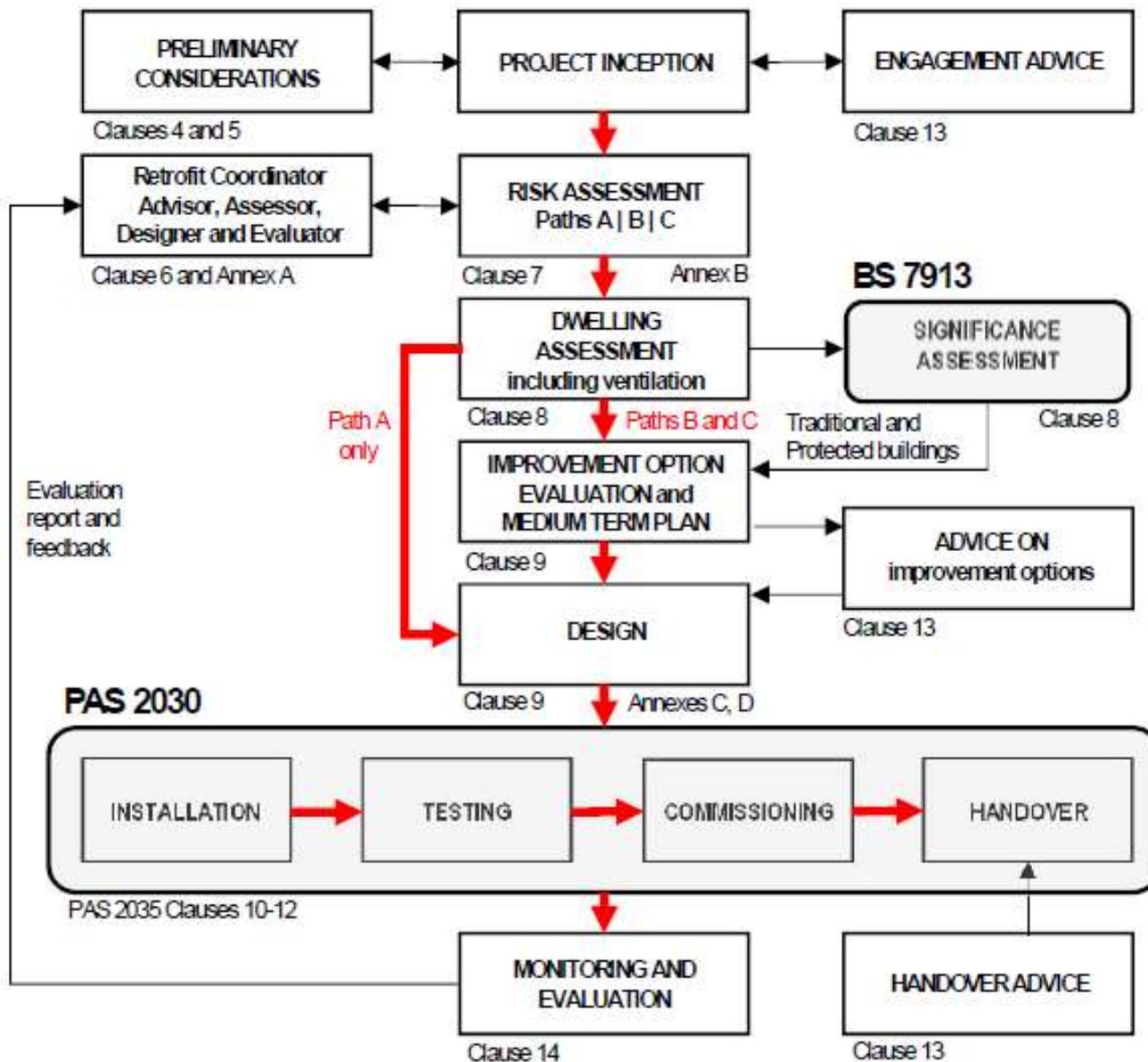
PAS 2035

Application

- Any domestic retrofit project (not just ECO)
- Must be used in conjunction with PAS 2030: 2019
- Requires the use of many other framework standards
 - PAS 2030, BS 5250, BS 7913, MCS standards, etc.

Compliance

- Every retrofit project must have a Retrofit Coordinator
- Retrofit Coordinator is responsible for
 - Ensuring PAS 2035 compliance
 - Protecting the client's interest and the public interest



PAS 2035 Establishing Intended Outcomes

Intended outcomes must be agreed with the Client and may include one or more of:

- Reductions in energy use
- Reductions in energy costs and/or alleviation of fuel poverty
- Reductions in emissions associated with energy use
- Improvement in internal comfort
- Improvement of internal air quality (IAQ)
- Elimination of condensation, damp and mould
- Reducing the risk of overheating
- Improvement in energy rating (e.g. SAP)
- Meeting a performance standard (e.g. NZEB or Passive House EnerPHit)
- Improving the usefulness or sustainability of the building
- Protecting the building against decay or deterioration
- Improving resistance to water penetration and resilience against flood risk
- Protection or enhancement of architectural heritage
- Integration of energy efficiency measures with other improvements
 - e.g. extension, loft conversion or general refurbishment
- Any other issues that might be considered relevant

PAS 2035 Risk Assessment

- Carried out by Retrofit Coordinator
 - Based on pre-assessment (triage) data
 - Before whole-dwelling and ventilation assessments
- Risk assessed as A, B or C
 - Depending on five criteria
 - Number of dwellings and measures, construction, built form
 - High rise and protected historic buildings are always risk C
- Assessed risk determines required qualifications
 - Retrofit Assessor | Retrofit Designer
- Assessed risk determines Path through the PAS
 - Path A: Simple requirements
 - Path B: More onerous requirements
 - Path C: Much more onerous requirements

PAS 2035 Annex B: Risk Assessment Criteria

1 Number of dwelling to be improved

Criterion 1: Number of dwellings in the project

The number of dwellings to be improved	Risk grade	Assessed grade
1-10	A	
11-30	B	
More than 30	C	

2 Average number of measures per dwelling

Criterion 2: Number of measures per dwelling¹

The average number of Improvement measures per dwelling	Risk grade	Assessed grade
1-2	A	
3-5	B	
More than 5	C	

3 Inherent technical risk of highest risk measure

Criterion 3: Measures proposed

The inherent technical risk of the highest-risk measure (from Table B2)	Risk Grade	Assessed grade
1	A	
2	B	
3	B	

4 Highest risk combination of measures

Criterion 4: Combination of measures

The highest-risk combination of measures (from the Measures Interaction Matrix, Figure D1)	Risk Grade	Assessed grade
GREEN	A	
ORANGE	B	
YELLOW	B	

5 Construction and built form of buildings

Criterion 5: Construction and Built Form

Construction and built form of buildings	Risk Grade	Assessed grade
Conventional ² , not high-rise, not protected ³	A	
Traditional ⁴ , not protected ³	B	
System-built ⁵ , not high-rise, not protected ³	B	
High rise ⁶ , any construction	C	
Protected ⁷ , any construction or built form	C	

Overall risk grade

Overall Risk Grade

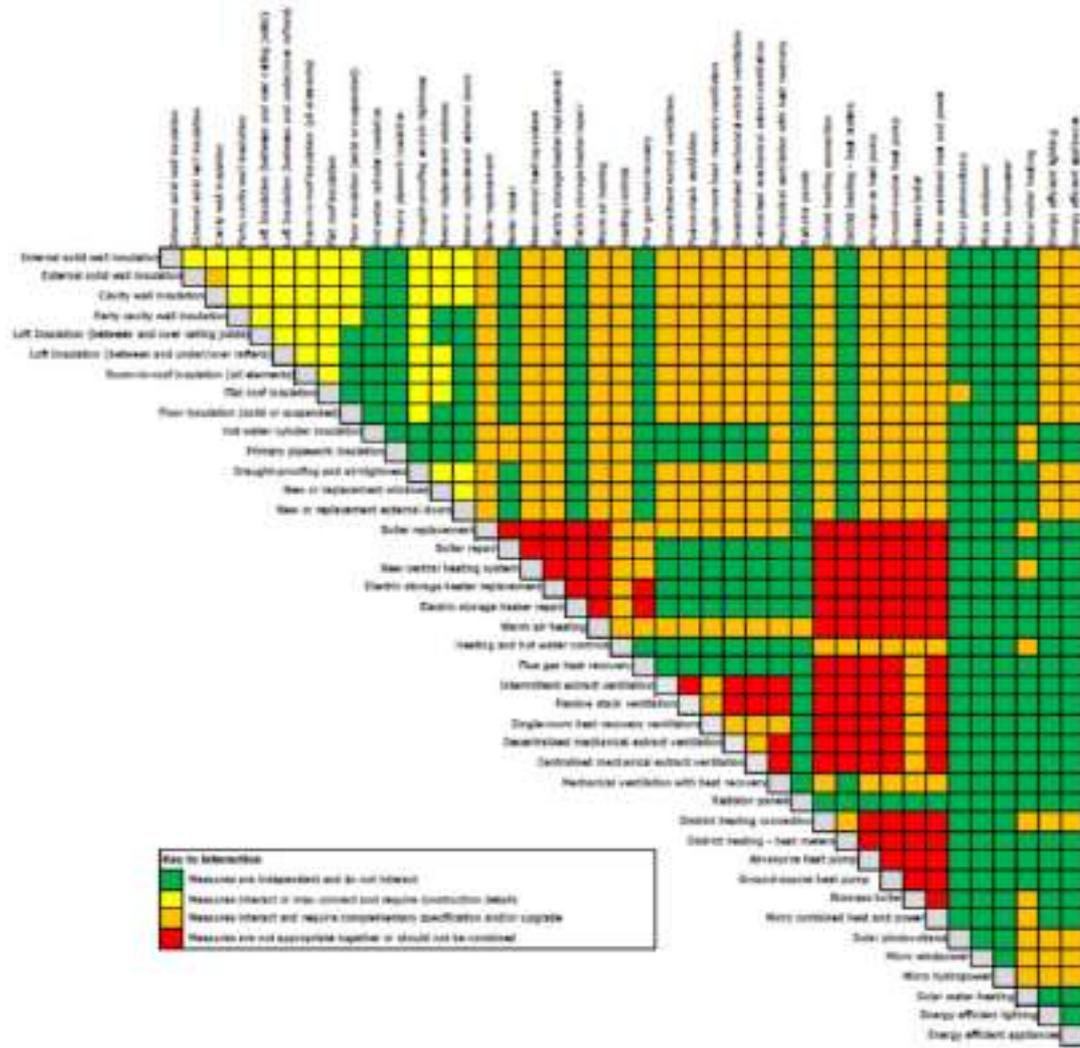
Highest assessed grade (from Criteria 1 to 5 above)	PAS 2035 Path	Assessed Path
A	A	
B	B	
C	C	

PAS 2035 Annex B: Risk Assessment

Inherent technical risks of measures

Measure	IHT	Measure	IHT
Internal solid wall insulation (IWI)	3	Intermittent extract ventilation	1
External solid wall insulation (EWI)	2	Passive stack ventilation	2
Cavity wall insulation	2	Single-room heat recovery ventilators	1
Party cavity wall insulation	2	Decentralised mechanical extract ventilation	2
Loft insulation (between and over joists)	2	Centralised mechanical extract ventilation	2
Loft insulation between/under/over rafters	2	Positive input ventilation	3
Flat roof insulation	3	Mechanical ventilation with heat recovery	3
Room in roof insulation (all elements)	3	Radiator reflector panels	1
Floor insulation (solid or suspended)	3	District / communal heating - connection	3
Hot water cylinder insulation	1	District / communal heating - heat meters	1
Primary pipework insulation	1	Air source heat pump	3
Draught-proofing / air-tightness measures	1	Ground source heat pump	3
New or replacement windows	1	Biomass boiler	2
New or replacement external doors	1	Micro combined heat and power	3
Boiler replacement	2	Solar photovoltaics	2
Boiler repair	1	Micro wind-power	2
New central heating system	2	Micro hydro-power	3
Replacement of electric storage heaters	1	Solar water heating	2
Repair of electric storage heaters	1	Energy efficient lighting	1
New warm air heating	2	Energy efficient appliances	1
Heating and hot water controls	1	Park home insulation	3
Flue gas heat recovery	2	Other EEMs, including innovations	3

PAS 2035 Measures Interaction Matrix



PAS 2035 Whole-Dwelling Assessment

The assessment must include:

- An appraisal of the dwelling's heritage, architectural features, structure, construction and condition and building services in sufficient detail to establish its suitability for improvement
- Identification of constraints imposed by the site, e.g. exposure, access, party walls, rights of light, consideration of adjoining properties, etc.
- Identification of any constraints imposed by the local planning authority.
- Identification of the location and severity of any construction defects or structural defects or leaks, and of any condensation or mould growth.
- Identification of energy efficiency measures already installed or proposed.
- A measured survey to establish the overall dimensions of the heat loss envelope, the dimensions of building elements and openings.
- An appraisal of the construction in sufficient detail to establish the U values and moisture properties of the main building elements.
- identification of the installed building services and controls.
- An occupancy assessment (number and any vulnerability of occupants)
- An estimate of annual fuel use, fuel cost and carbon dioxide emissions made from fuel bills or by using SAP or PHPP.

PAS 2035 Annex C: Ventilation

Assessment

- Existing ventilation is inadequate if
 - Evidence of condensation or mould
 - No working ventilation system present
 - Ventilation present but incomplete (including air inlets)
 - Good IEV or PSV but intended/potential $Q_{50} < 5 \text{ m}^3/\text{m}^2\text{h}$

Upgrade

- If existing ventilation is inadequate then
 - If intended $Q_{50} > 5 \text{ m}^3/\text{m}^2\text{h}$ then IEV or PSV required
 - If intended $Q_{50} < 5 \text{ m}^3/\text{m}^2\text{h}$ then MEV, MVHR or PIV required
 - System capacity must be based on full occupancy
 - Demand control required to ensure energy efficiency

PAS 2035 Design

- The scope of the retrofit design depends on the risk Path
- Irrespective of Path, all designs must:
 - Provide for the outcomes agreed with the Client
 - Be based on the whole-dwelling assessment
 - Take account of the architectural and heritage context
 - Take account of planning and building control requirements
 - Allow for the management of moisture in the building
 - Include construction details (corners, junctions and edges)
 - Consider interfaces between fabric, systems and occupants
 - Include a ventilation upgrade if required
 - Specify testing, commissioning and handover requirements
 - Specify required guarantees and warranties

PAS 2035 Design

- Path A allows
 - Design of single-measure system improvements by specialists
 - Subject to review of the design by the Retrofit Coordinator
- Paths B and C require
 - An improvement option evaluation to determine the appropriate package of measures for the dwelling(s)
 - Based on a SAP or PHPP assessment
 - A medium-term retrofit plan to identify and prioritise the improvements the dwelling needs by 2050
 - Even if they cannot all be implemented immediately
- Path C also requires
 - Specialist expertise when traditionally constructed or protected buildings are to be improved

Installation

- Installation of retrofit measures must comply with PAS 2030: 2019
- The PAS 2030 Retrofit Installer must work to a design that is compliant with PAS 2035
- PAS 2030 includes requirements for
 - Validating the design and preparing a method statement
 - Qualification or competence of operatives
 - Pre-installation building inspections
 - The installation process (measure-specific requirements)
 - Testing, commissioning and handover
 - Provision of guarantees and warranties
 - Record keeping

PAS 2035 Monitoring

- Objectives
 - To confirm that intended outcomes have been achieved
 - To identify any unintended consequences
- Basic monitoring
 - Applies to every project (questionnaire)
 - Confirms outcomes and customer satisfaction
- Intermediate monitoring
 - Investigates poor outcomes, unintended consequences
- Advanced monitoring
 - Further investigation to understand and resolve discrepancies between predicted and actual outcomes

PAS 2035 Summary

- Retrofit Coordinator
 - Required for every project
 - Must agree intended outcomes with client
- Risk assessment
 - Based on pre-assessment (triage)
 - Determines the Path (A-C) through the PAS
- Assessment
 - Whole dwelling assessment required, including context and condition
- Design
 - Requirements depend on the risk Path (A-C)
 - Improvement option evaluation and medium term plans required (B, C)
 - Additional requirements for traditionally constructed and protected buildings
 - Moisture management is integral to the design requirements
 - Ventilation upgrades required if existing is assessed as inadequate
- Measures Interaction Matrix
 - Used in risk assessment (inherent and combined risks)
 - Identifies where retrofit design must consider interfaces
- Monitoring
 - Confirms agreed outcomes, investigates discrepancies



TRUSTMARK
Government Endorsed Quality

TrustMark The Drive for Quality

Jan 2020

trustmark.org.uk

TrustMark – the Quality Mark

The Journey

TrustMark is a 'not for profit', Social Enterprise that has stood at the intersection of trade and consumer protection since 2005. In 2016, the industry led, Government commissioned Each Home Counts (EHC) review identified the need for an all-encompassing mark of quality that consumers can recognise and trust.

TrustMark has developed its remit to become the only

Government Endorsed Quality Scheme



2015 - Bonfield Review into Energy Efficiency quality

2016 - Bonfield Review becomes the Each Home Counts review

2017 - EHC Implementation Group formed

2017 - TrustMark Identified as the Quality Mark

2018 - TrustMark reformed and agrees delivery of EHC recommendations

2018 - TrustMark re-launched as Quality scheme

2018 - Funding for Data-Warehouse and Property Passport agreed

2019 – TrustMark and new standards written into ECO regulations

TrustMark Quality Scheme

Scope

The Government Endorsed Quality Scheme for the Retro-Fit, Repair, Maintenance and Improvement (RMI) and Energy Efficiency sectors

Government Endorsed Requirements

- Independent Board and Sector Councils
- A robust Framework Operating Requirement
- The Code of Conduct
- The Customer Charter



Compliance and Enforcement

- Risk based audits of Scheme Providers
- Witnessed on-site inspections of Businesses
- Risk based and random monitoring
- Effective sanctions and resolution services
- **Embedded Trading Standards Officers** and enforcement process

Energy Company Obligation (ECO)

- Adoption of TrustMark into the ECO regulations, installation and compliance and lodgement areas will require TrustMark
- Underpinned implementation of New PAS standards
- Sensible transition being implemented

TrustMark – How it works

BEIS Government Department

- Master Licence Agreement

TrustMark

- Sub-licence agreements and Framework Operating Requirements
- Audit and compliance requirements

Scheme Provider

- Sub-licence agreement and Code of Conduct
- Inspection and audit of licenced businesses
- Delivery of Technical Standards

Licensed Business

- Consumer Charter

Consumer / Customer

- Protected

Framework – the engine of the quality mark that determines how the Scheme Providers register the businesses.

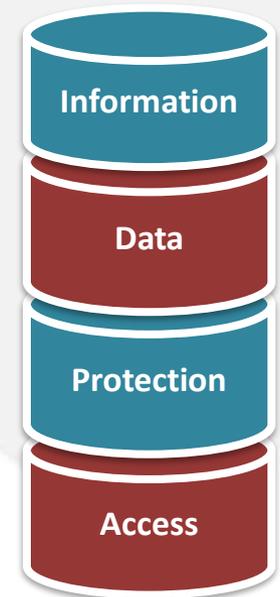
Code of Conduct – sets out the expectations and requirements between the business and the Scheme Provider, the consumer and the legislation applicable.

Customer Charter – what the customer should expect when engaging with the business.

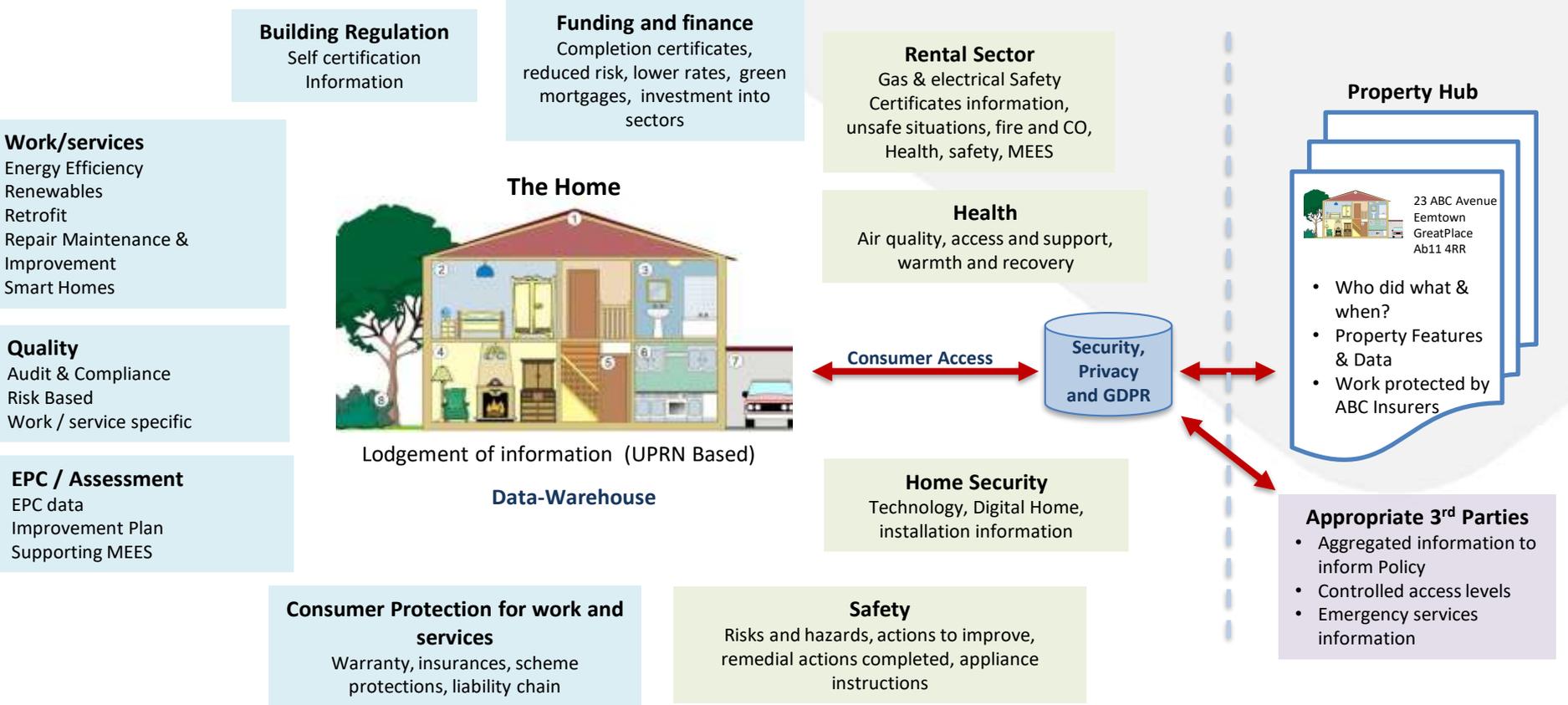
Technical Standards that are applicable to that sector.

Data Warehouse

- Following the EHC review and other related incidents, Government and Industry had the desire to create a central data-access point for work and services undertaken in the home.
- Lack of continuity of information relating to a property and the ability to identify the areas of protection provided.
- The reduction of business and consumer detriment in managing challenges that arise from the delivery of work and services into a property.
- Who did what installation/service, when and how is it protected in and around the home?
- Data Warehouse went live in November 2019. Property Hub to be full launched in Q1 2020



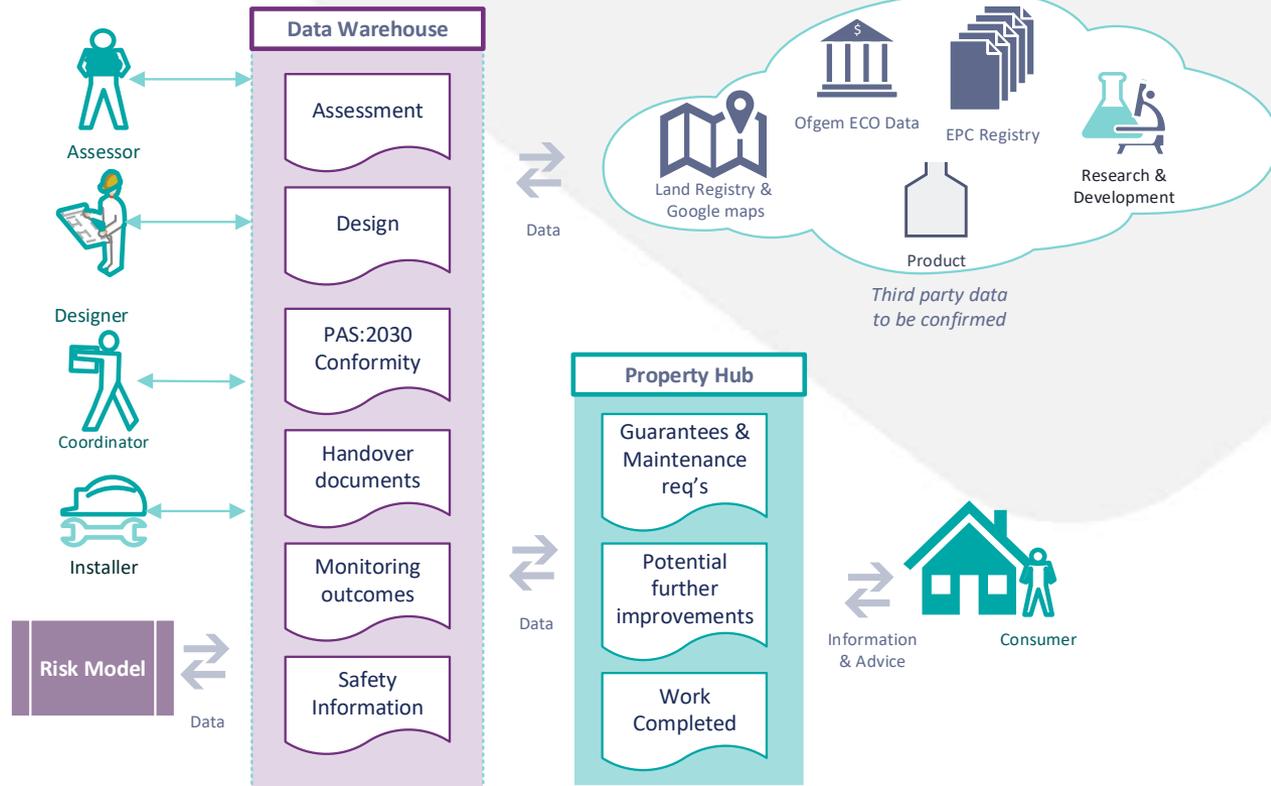
Data Warehouse



Compliance Overview

Data Warehouse will support:

- Audit and compliance of work
- Audit trail for property owner
- Financial and consumer protection through knowledge
- Information on housing stock improvement
- Avoid cost duplication and certification replication
- Link to other recognised data sources to provide effective consumer information

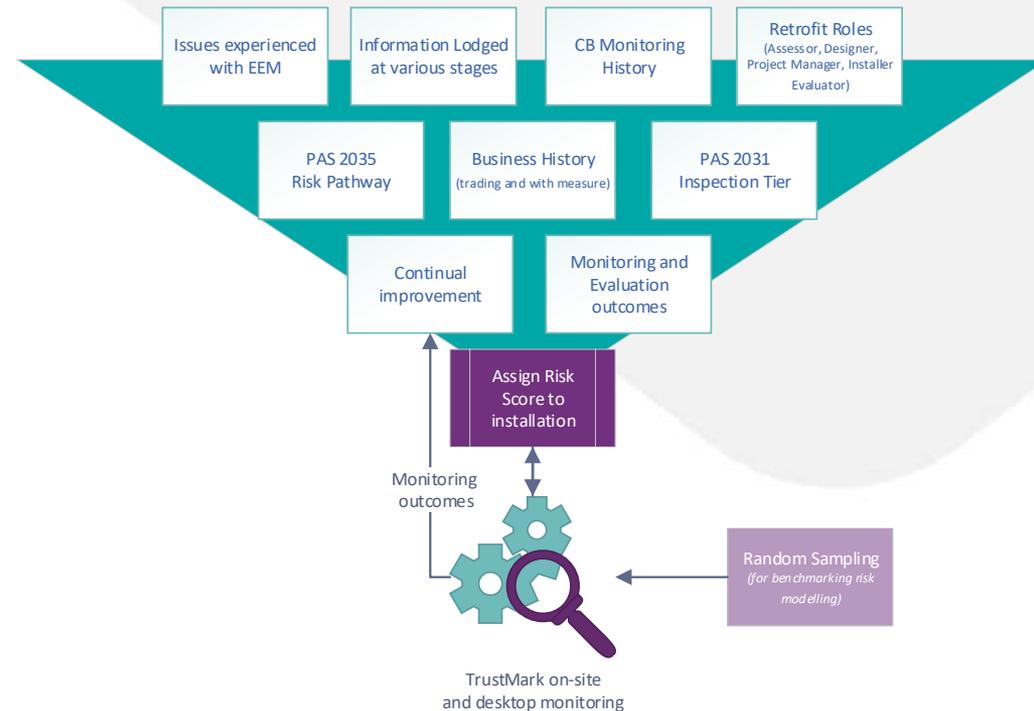


PAS 2035 – Compliance & Enforcement

Compliance & monitoring

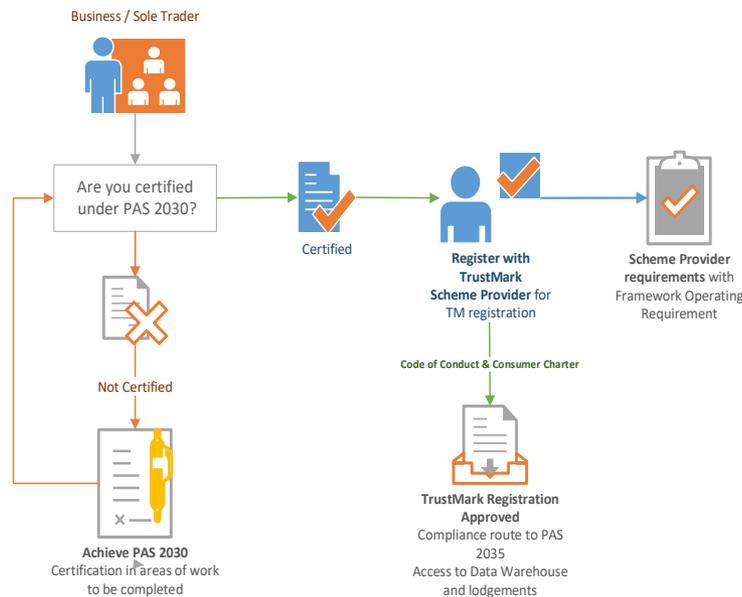
- UKAS retain their role in monitoring Certifying Bodies to ISO17065 and delivery of PAS 2030 via 2031
- TrustMark is responsible for PAS 2035 audit and compliance
- Pilot being undertaken to establish base lines for risk and compliance requirements
- Minimum of annual audits on Retrofit scheme providers
- Targeted inspection of work on-site focused on risk rating

Risk Modelling



TrustMark – Registration and Timescales

Registration process for PAS 2035



Timescales

- PAS 2035 introduced in June 19
- PAS requirement placed into Regulations for ECO in 31st October 2019 alongside requirement for TrustMark and Data Warehouse
- Transition for PAS 2035 agreed to run through to 30th June 2021
- Jan 1st 2020 requirement for TrustMark and Data Warehouse for ECO work.
- June 2021 requirement for all work under Energy Efficiency to be PAS 2035 compliant
- Spring 2020 introduction of Government funding to tackle lower level EPC property

The Market Challenge (and opportunity)

Scale of the challenge:

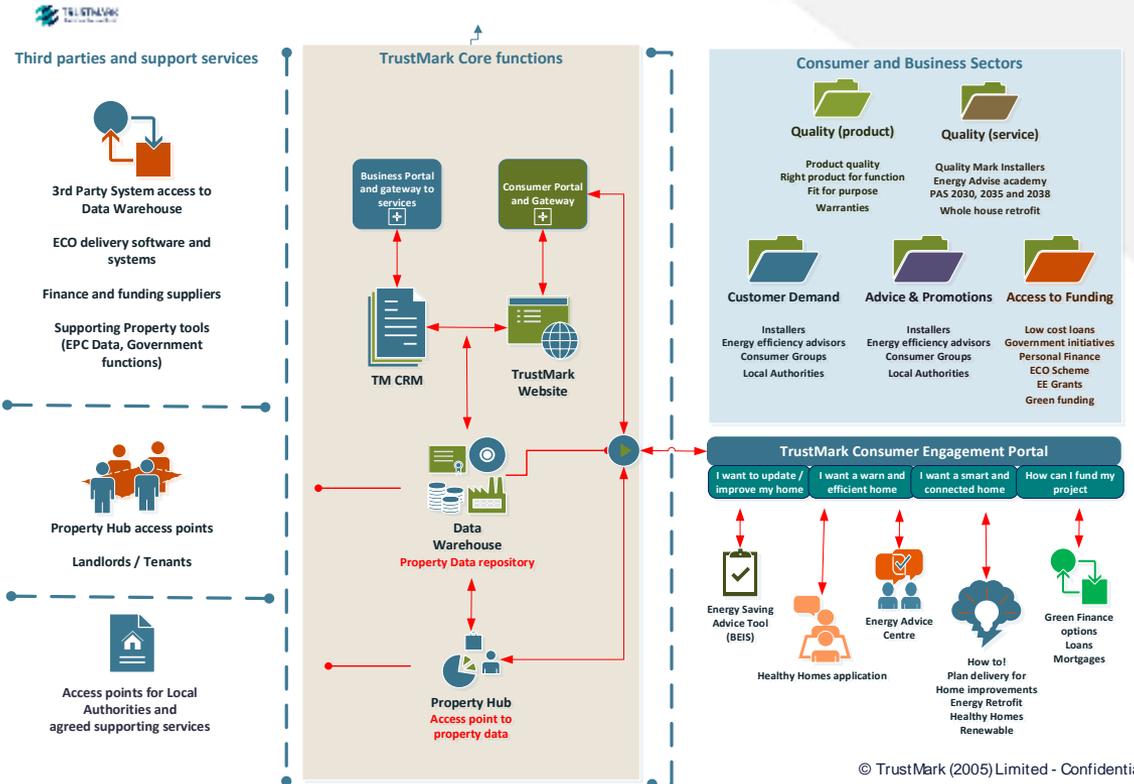
EPC Banding	% of property (based upon 12M homes)
Band A	12K – 0.1%
Band B	1M – 8.1%
Band C	3.3M – 26.6%
Band d	5M – 40.3%
Band E	2.3M – 18.5%
Band F	616K – 5.0%
Band G	178K – 1.4%

- Net carbon zero by 2050 (or sooner in some cases)
- Current UK housing stock is circa 27.5 Million homes generating 40% of the carbon output - (DECC 2016)
- 300k homes to be built per annum (Government Target) (current run rate circa 170k per annum)
- 24M properties need to be retrofitted over the next 30years generating an estimated 600 Billion marketplace (based upon 25K per property)
- Delivery of the product supply chain with assurances of quality and delivery
- Requirement to train and deliver new skills and a workforce to suit the challenges we are facing, an estimated 300K new trades people will be required.
- All sectors of housing will need to be funded through new initiatives and ventures; low levels of historic savings will challenge the able to pay sector.
- Quality delivery must be achieved, and confidence built in the markets.
- Behavioral change needed to support the massive drive that will be required to deliver this program.

- Access for all the sectors (Able to Pay, Public, Private and Rental) to financiers with circa 4.9B they are willing to lend into the home improvement areas.

- Improved quality assurance, improved standards and build professionalism, deal with root cause issues

Building the Market / Opportunity



- Supporting Consumers and Businesses
- Strategic partners
- Providing established tools
- Bringing quality information together
- Building a green finance option
- Providing business tools
- Providing options and routes for consumers

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