PAS 2038

Retrofitting non-domestic buildings for improved energy efficiency - Specification

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Current Status of PAS 2038

- The PAS is currently only issued in draft
- Everything covered today is presented in that context
- As a member of the development steering group I have no information on why the issue has been delayed – except.

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Context

- The UK requires significant improvements to the energy efficiency of its building stock, including nearly all its two million non-domestic buildings. (Climate Change Act 2019 amendment net zero omissions requirement)
- The PAS is intended to support work towards that objective by promoting and defining technically robust and responsible “‘whole-building” retrofit processes that support this work being done well

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a) improved functionality, usability and durability of buildings;

b) improved comfort, well-being, health and safety (including fire safety) and productivity of building occupants and visitors;

c) enabling buildings to use low- or zero-carbon energy supplies;

d) improved energy efficiency, leading to reduced fuel use, fuel costs and pollution (especially greenhouse gas emissions associated with energy use);

e) reduced environmental impacts of buildings;

f) protection and enhancement of the architectural and cultural heritage as represented by the building stock;

g) avoidance of unintended consequences from any of the above

h) minimisation of the “performance gap” that occurs when reductions in fuel use or cost carbon emissions are not as large as intended or predicted.

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Scope

- The PAS specifies requirements for retrofitting non-domestic buildings for improved energy efficiency.
- It covers all buildings except those used as private dwellings (i.e. houses, bungalows, flats or apartments).
- However, non-domestic buildings do include multi-residential buildings in which occupants share some communal facilities, e.g. hotels, guest houses, hostels and students' and nurses' accommodation.

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Concept

- This PAS has been developed on the basis of being a logical Non-Domestic follow on to the Domestic Retrofit arrangements, however:
- There is no equivalent retrofit funding in the Non-Domestic area
- There is already a well established supply chain for larger Non-Domestic clients
- In the past 3 years MEES has made the EPC rating a major driver

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In Non-Domestic buildings retro fit projects are driven by many different factors, for example:

- Change of tenancy
- Technical obsolescence
- Functional obsolescence
- Aesthetic obsolescence (usually retail)

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- The general approach to retrofitting specified in the PAS is to reduce energy demand, improve energy efficiency, decarbonise the building services and, for larger buildings, minimise whole life emissions.

- Many large organisations already have this bolted down and subscribe to International Standards that exceed the requirements of the PAS.

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The PAS addresses the project in stages

a) appointment of a project team and agreement of an initial brief

b) assessment of the building, including its context, condition, occupancy and performance

c) evaluation of improvement options to identify appropriate work

d) agreement of intended outcomes, including performance targets

e) preparation of an improvement plan, possibly to be implemented in stages, design and specification of the work and obtaining statutory approvals

f) carrying out the retrofit work (installing measures), testing, commissioning and handover of the retrofitted building

g) fine-tuning of performance to meet or surpass the intended targets

h) evaluation of the project to confirm outcomes, identify any unintended consequences and specify any necessary remedial works.

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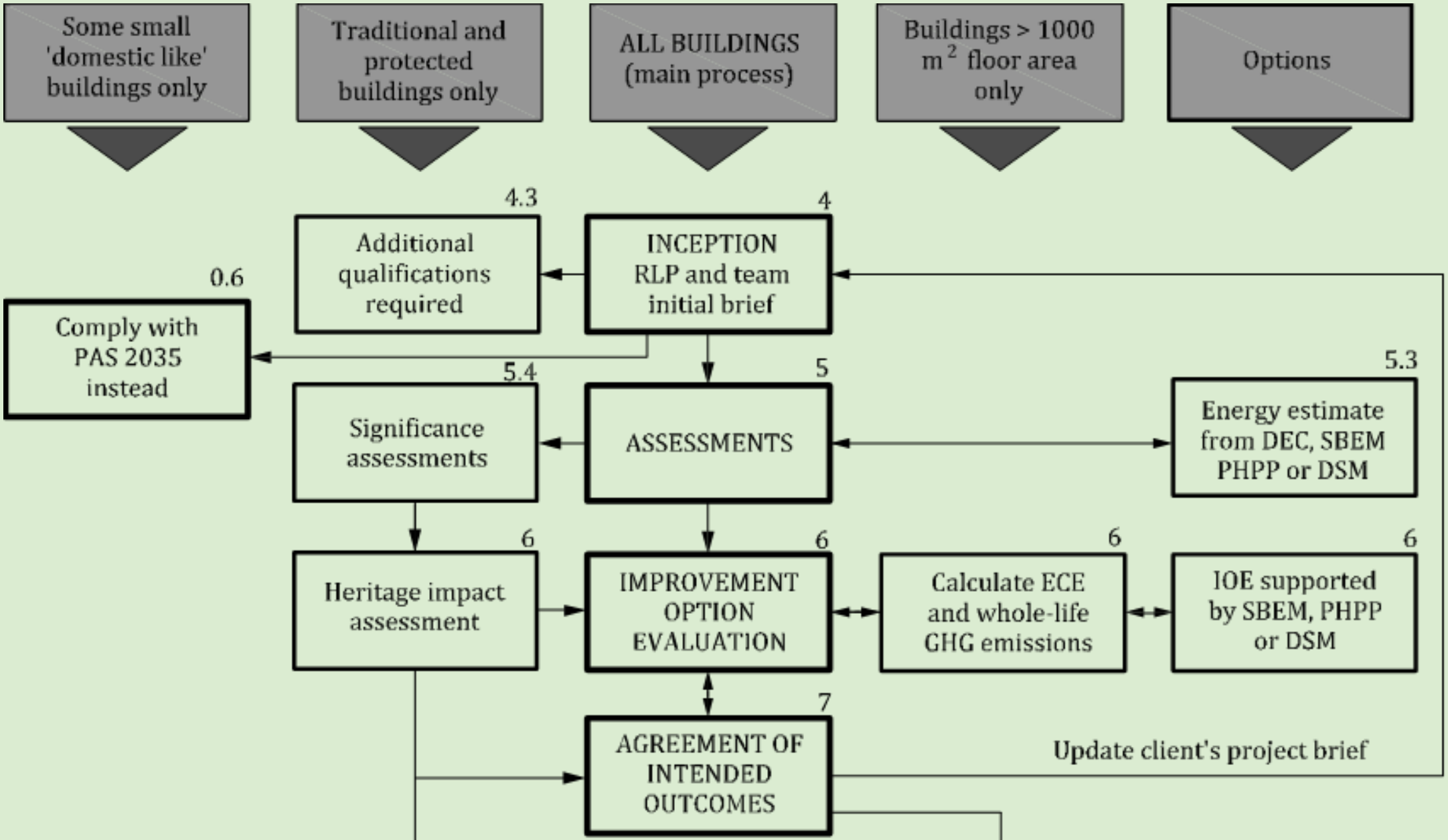
Diagrammatic summary of PAS 2038 retrofit process



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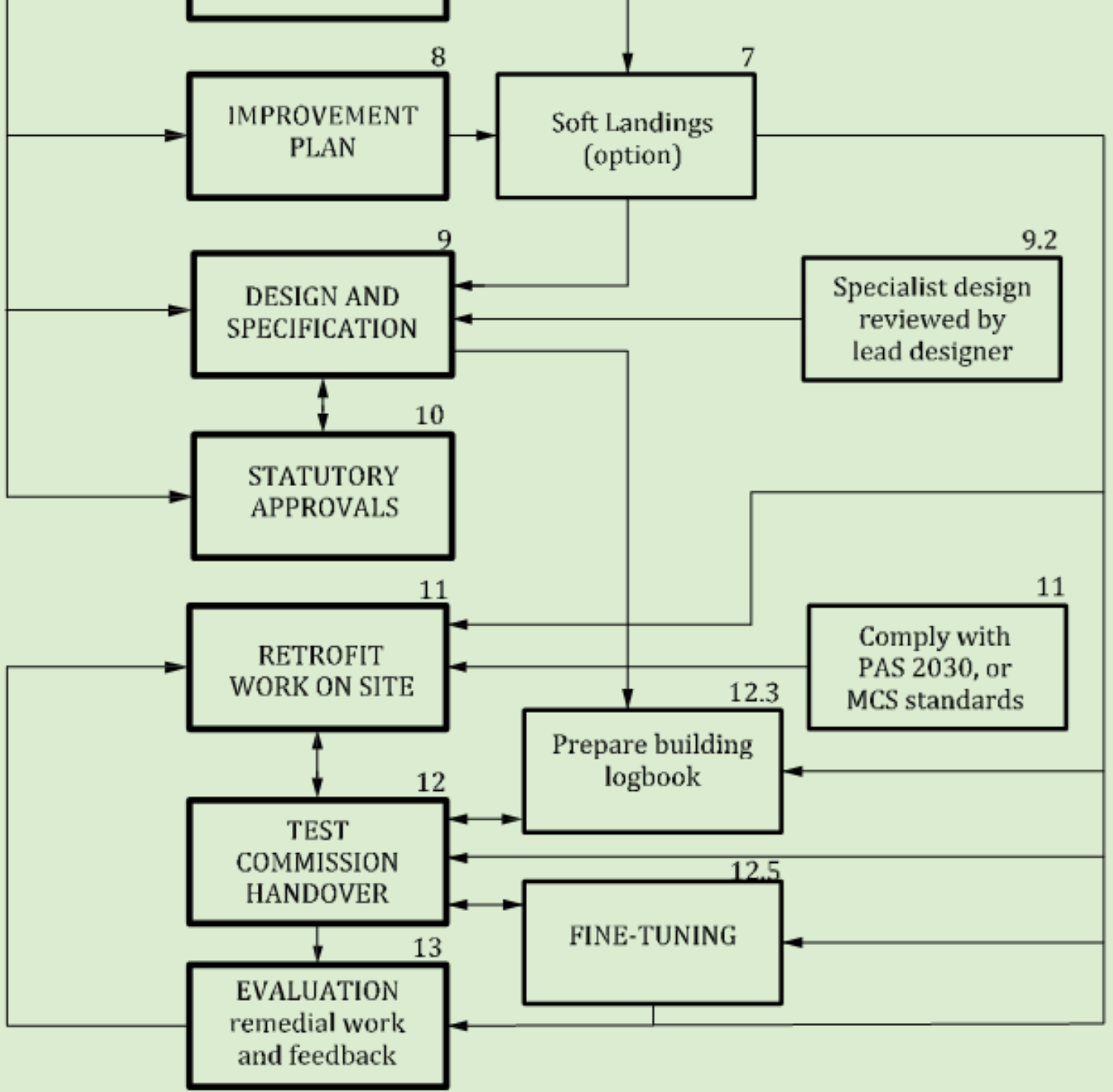

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Alternative approach for smaller buildings - If the building to be retrofitted:

a) has floor area not exceeding 500 m^2;

b) is not more than three stories in height (including any basement);

c) is constructed of load-bearing masonry walls (solid or cavity brickwork/blockwork, or stone), or is timber-framed and clad externally with brick or timber;

d) has mostly pitched roofs with timber structure, covered in tiles or slates; and

e) has building services that consist of heating, hot water, ventilation, lighting and small power only, possibly supplemented by solar photovoltaic or solar thermal systems (i.e. there is no central air handling, mechanical cooling or air conditioning);

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- In this circumstance, as an alternative to this PAS, the retrofit project may adhere instead to the requirements of PAS 2035:2019, provided that:

- the Retrofit Coordinator for the project is qualified as a Non-Domestic Energy Assessor (NDEA)

- and holds the Level 5 Diploma in Retrofit Coordination and Risk Management

- the modelling software used for the PAS 2035:2019 improvement option evaluation is based on the Simplified Building Energy Method (e.g. iSBEM); and

- compliance with PAS 2035:2019 is self-certified by the Retrofit Coordinator in accordance with PAS 2035:2019, on behalf of the client for the project.

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This PAS can be applied to all non-domestic retrofit activity and embraces work that is initiated, procured, funded and delivered in a wide variety of ways, including:

- programmes of retrofit promoted and/or funded by national or local government schemes;
- programmes of retrofit initiated and/or funded by landlords and commercial property portfolio holders;
- retrofit of individual buildings by their owners and/or occupants; and
- retrofit that is integrated with and forms part of broader repairs, maintenance and improvement (RMI) activity related to individual buildings or building stocks.

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Retrofit Lead Professional will review:

- the objectives of the project;
- the anticipated or desired outcomes;
- any constraints possibly imposed by planning, regulatory, conservation or environmental considerations, including the potential need for statutory approvals
- any constraints possibly imposed by the building itself, i.e. architectural, structural, engineering, maintenance or health and safety considerations;
- the likely cost and the available budget; and
- the retrofit process required by this PAS, including the purpose of the assessment and improvement option evaluation and the role of the improvement plan in establishing a path to “net zero carbon” operation.

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The Retrofit Lead Professional shall also:

- identify and document the client's interest and the public interest and take appropriate action so that they are protected;
- agree the intended outcomes of the project with the client;
- oversee the project from inception to completion, including handover, any fine tuning, and evaluation, on behalf of the client;
- lead the identification, assessment and management of technical and process risks associated with the project;
- coordinate the activities of the other members of the project team; and
- record and report the evidence of the project's compliance with the PAS.

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The retrofit lead professional will be chosen:

- Dependent on the nature of the project will likely be an Architect or Building Services Engineer.
- Professional body membership will not be required, but is preferred.
- The energy analysis will require in many cases a registered NDEA to be part of the team. If you are doing MEES work you are already doing much of this.

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The retrofit lead professional will be chosen:

- Where proprietary systems are to be incorporated in the retrofit design, the designs and specifications for those systems shall be obtained from specialist designers or specifiers trained and accredited by the manufacturers or suppliers. Designs and specifications so obtained shall be reviewed for suitability and compatibility by the lead designer before they are incorporated into the overall retrofit design.

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Examples of proprietary systems include:

a) *solid wall insulation systems (external);*

b) *cladding and glazing systems;*

c) *systems for insulating suspended ground floors;*

d) *ventilation systems (including air handling plant, heat recovery devices, fans, ductwork, air inlets and outlets);*

a) *heating systems (including boilers, heat pumps and heat distribution systems);*

b) *hot water plant (including calorifiers and stores);*

c) *cooling plant (including chillers, split systems and distribution systems);*

d) *renewable energy systems (solar photovoltaic or solar thermal systems, including inverters, batteries and heat stores);*

e) *lighting systems; and*

f) *control systems for any of the above.*

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The PAS addresses high level project management principles but it also delves into very detailed design requirements, for example:

- make provision for fresh-air ventilation to limit the risk of transmission of airborne diseases;
- make provision for ventilation for the safe operation of all combustion appliances in accordance with the manufacturers' instructions and the relevant British Standards;
- provide resilience against rainwater ingress (including ingress due to the failure of any critical element or construction detail);
- provide resilience of the whole building against the effects of climate change, including flooding;
- include an updated fire safety strategy so that the installation of measures is not detrimental to the fire safety of the building; and
- specify any maintenance requirements necessary for the long-term integrity of the installation.

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In summary

- The PAS has tried to cover all aspects of every project at every level of detail.
- This is very laudable, but very ambitious especially when most of what is being attempted is already well established and documented.
- With the exception of sub 500 m^2 buildings using the Domestic retrofit assessor it is difficult to envisage how this can be used in practice. It adds a layer of complexity on what is already a complex situation.
- This is going to be a bit like the training vaccinators fiasco.

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BUT -

- It will provide a further opportunity for Domestic Retrofit Assessors that are NDEAs or work with an NDEA.
- If the government put ECO equivalent funding in place

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