Future Homes Hub

Future Homes Standard READY

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WELCOME TO THE

# Future Homes Standard Technical Conference

Be sure to share your experience on LinkedIn using #FHSReady

# Richard Lankshear

Programme Director

Future Homes Hub

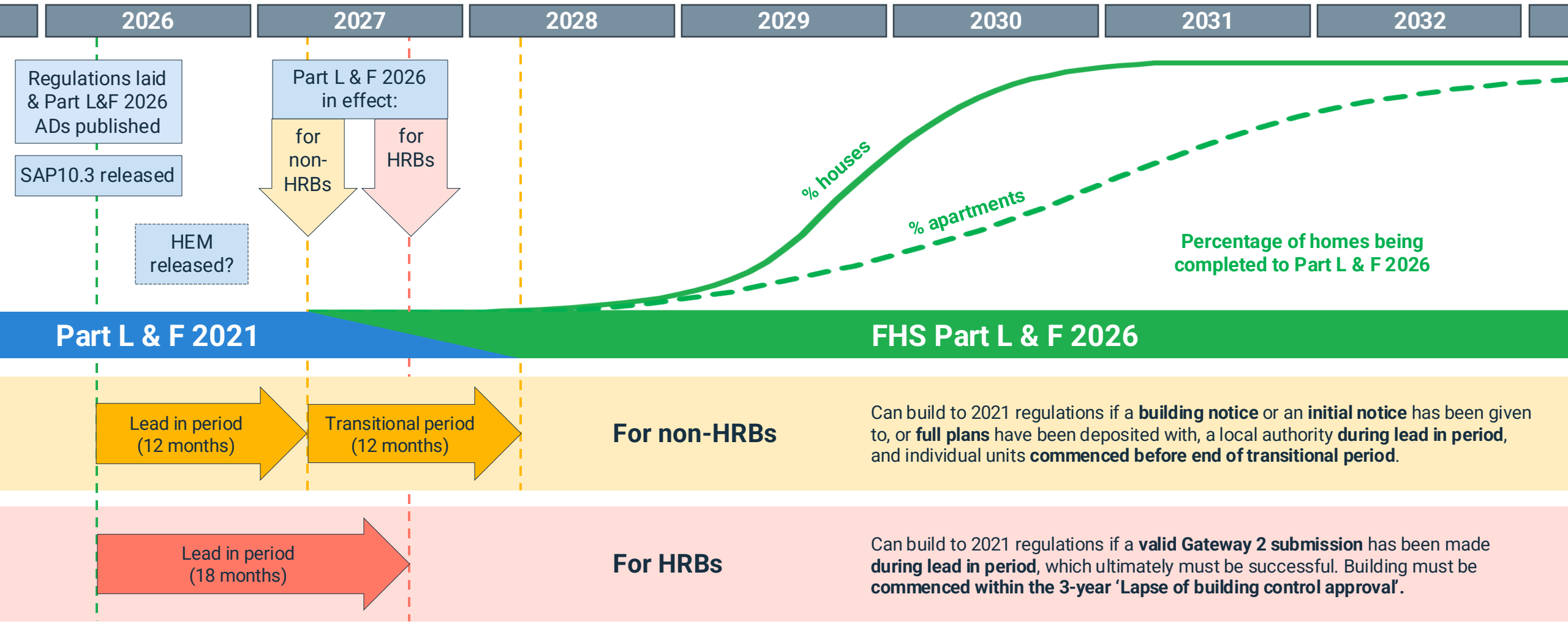
# We’ve come a long way….

# Future Homes Standard: New Parts L and F published on 24 March 2026

## Part L 2026


## Part F 2026

# FHS Timeline




**For non-HRBs**

Can build to 2021 regulations if a **building notice** or an **initial notice** has been given to, or **full plans** have been deposited with, a local authority **during lead in period**, and individual units **commenced before end of transitional period**.

**For HRBs**

Can build to 2021 regulations if a **valid Gateway 2 submission** has been made **during lead in period**, which ultimately must be successful. Building must be **commenced within the 3-year 'Lapse of building control approval'.**

HRB = High Risk Building

Note: definition of commencement as per Regulation 46A

# The Future Homes Standard Essentials

## Seven actions to de-risk delivery today


1. Lead early, learn fast, share lessons
2. Prioritise grid availability
3. Own the customer journey
4. Evolve your design
5. Get heating design right
6. Build as designed
7. Commission with care

**www.futurehomes.org.uk/future-homes-standard-ready**

**Google: get future homes standard ready**

# User specific guidance - published








# Get FHS Ready Webinars and Podcasts

Fridays 1-2pm

## Available now in the members area

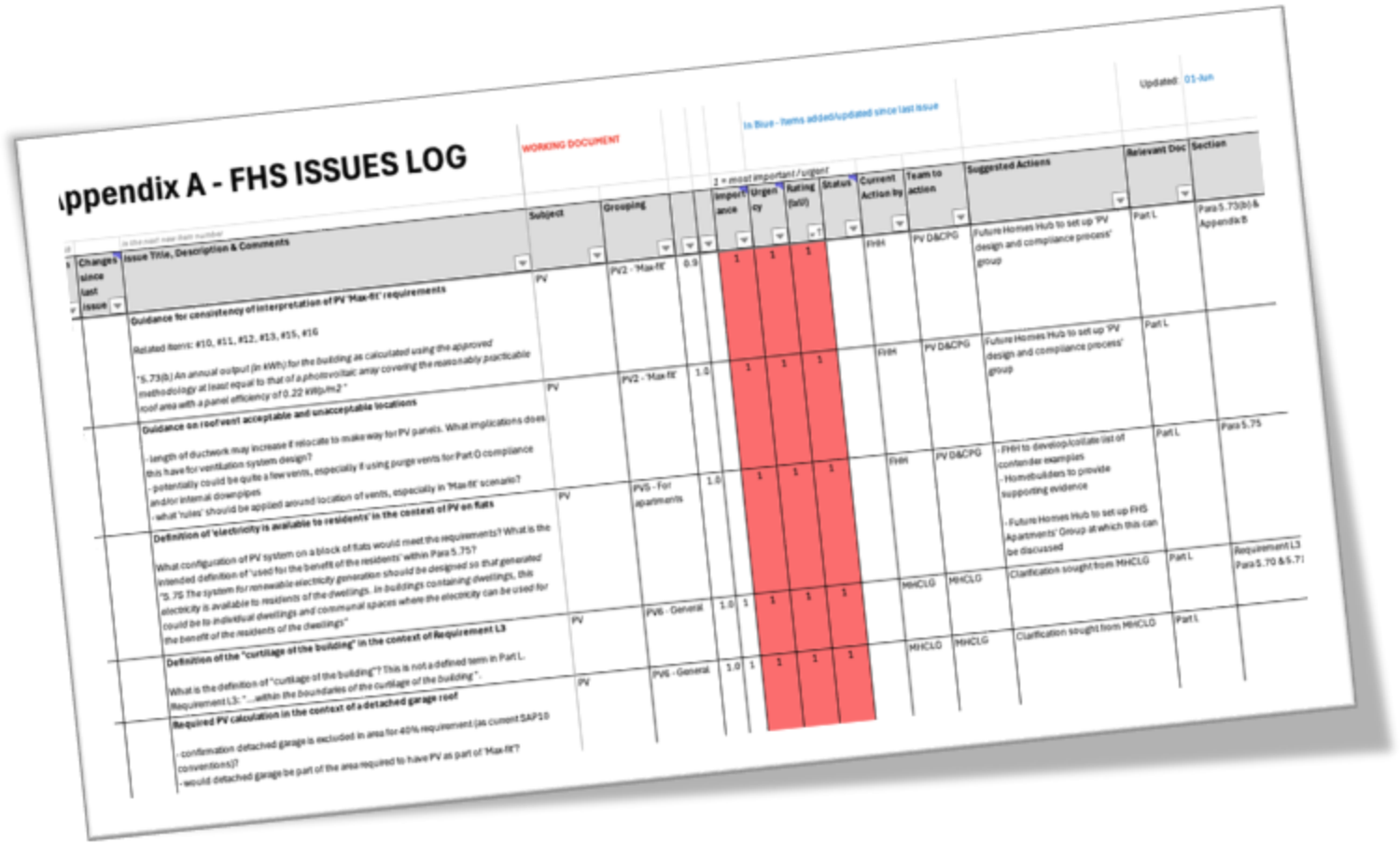
- Future Homes Standard Reflections
- Lead early, learn fast, share lessons
- Delivering homes with heat pumps
- Build as designed
- Prioritise grid availability
- Getting heating design right, part 1

## Coming up

- Getting heating design right, part 2 (3 July)
- Commission with care (10 July)
- Owning the customer journey (17 July)
- Evolving your design (18 September)
- Ventilation in new homes (9 October)

## On demand

# FHS Publication issues



Appendix A - FHS ISSUES LOG

WORKING DOCUMENT

In Blue - Items added/updated since last issue

Updated: 01-Jun

1 = most important / urgent

| Changes since last issue | Issue Title, Description & Comments | Subject | Grouping | | Importance | Urgency | Rating (Int'l) | Status | Current Action by | Team to action | Suggested Actions | Relevant Doc | Section |
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**FHS mailbox to feed in queries /issues:**

**FHSqueries@futurehomes.org.uk**

# Agenda

| | |
|---|---|
| 09:00 - 09:20 | **Welcome and introduction** |
| 09:20 - 10:10 | **Fabric first & reactions to SAP 10.3**<br>Aldersgate (Programme A) |
| 10:10 - 11:00 | **All things PV**<br>Aldersgate (Programme A) |
| 11:00 - 11:30 | **Morning Break and Exhibition** |
| 11:30 - 12:20 | **Feeling the heat: part 1**<br>Aldersgate (Programme A) |
| 12:20 - 13:10 | **Fresh thinking on ventilation & IAQ**<br>Aldersgate (Programme A) |
| 13:10 - 14:00 | **Lunch and Exhibition** |
| 14:00 - 14:50 | **Feeling the heat: part 2**<br>Aldersgate (Programme A) |
| 14:50 - 15:40 | **Powering up**<br>Aldersgate (Programme A) |
| 15:40 - 16:10 | **Afternoon Break and Exhibition** |
| 16:10 - 17:00 | **Learning by doing** Wesley Suite (Programme A & B) |
| 17:00 - 18:00 | **Drinks Reception** ***sponsored by PassivUK*** |

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# Fabric first and reactions to SAP 10.3

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**New Build Dwellings Manager**
Elmhurst Energy

**Graeme Smith**
**Group Design and Innovations Director**
Untypical

# Fabric first and reactions to SAP 10.3

## Jason Hewins

**New Build Dwellings Manager**

Elmhurst Energy

elmhurst energy | EXCELLENCE IN ENERGY ASSESSMENT

# SAP 10.3 & HEM

- On 10th February 2026 MHCLG confirmed Future Homes Standard would be with only SAP 10.3 to be used to demonstrate compliance.

- SAP 10.3 is a modified version of the current SAP 10.2 methodology;
  - Uses FHS notional dwelling to set FHS compliance standards
  - Uses updated primary energy and carbon factors

- Intention to provide a smoother transition to the Future Homes Standard whilst the industry adjusts to the Home Energy Model.

- The intent is still for Home Energy Model to replace SAP via a transition.

elmhurst energy | EXCELLENCE IN ENERGY ASSESSMENT

# SAP to HEM Transition

- The FHS consultation responses confirmed the following transition;
  - At least 3 months after the FHS is released (24th March 2026) that HEM will be ready and become an approved methodology for the FHS.
  - Then at least a two year dual running period will begin where SAP and HEM can be used for the FHS.
  - Towards the end of the dual running period MHCLG will give a six month notice that HEM will be taking over from SAP.
  - At the end of the six month period any uncommenced site/plots must be assessed on HEM.

elmhurst energy | EXCELLENCE IN ENERGY ASSESSMENT

# Fabric

- The notional dwelling contained the following changes for fabric;

| | Part L 2021 | Part L 2026 (FHS) |
|---|---|---|
| Floor (w/m²k) | 0.13 | |
| Wall (w/m²k) | 0.18 | |
| Roof (w/m²k) | 0.11 | |
| Door (w/m²k) | 1 | |
| Window (w/m²k) | u-1.2, g-0.63 | u-1.2, g-same as actual |
| Airtightness | 5 m³/m²/hr @ 50 Pa | 4 m³/m²/hr @ 50 Pa |
| Ventilation | Natural with intermittent fans | Continuous dMEV, 0.15 w/l/s |

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# Opening U-values

- Part L 2021 allows the U-value of a window or door to be determined using standard sizes and configurations.

- In FHS u-value of windows and doors in new homes should be calculated using either;
  - the actual size and configuration of the window or door BS EN ISO 10077-1/10077-2, or
  - measured using the hot box method in BS EN ISO 12567-1/12567-2

- No longer possible to use standard sizes or configurations; every unit configuration will need an individual u-value to be entered.

# Fabric first and reactions to SAP 10.3

**Alex Brooks**
**Managing Director**
AES Sustainability

# SAP 10.3/Part L 2026

## Fabric Options

Building a better world

AES Sustainability

# Case Study

- 3 bed Semi Detached

GF: 45m$^2$
TFA: 90m$^2$


# Case Study

- 5 bed Detached

GF: 85m$^2$
TFA: 170m$^2$


# SAP 10.3 - What doesn't work?

## *Increased solar gain (g-values)*

Improving FEE performance could previously be addressed through increased g-value = more solar gain

However, this lead to a conflict with Part O

FHS addresses this by setting the 'notional' g-value to the same as the actual g-value, so where lower values required to pass Part O this doesn't penalise the SAP calculation.

## *Airtightness*

Another previous 'easy win' was to improve airtightness, often used at a late stage to accommodate any necessary spec changes during construction.

SAP 10.3 now provides no real benefit below ~ 4.5, in some cases higher than this.

| Airtightness | DFEE/TFEE % |
|---|---|
| 5.0 | 1.55 |
| 4.5 | 2.37 |
| 4.0 | 2.37 |
| 3.5 | 2.37 |

# Part L 2021 Spec

## *Does it Work?*

| Spec Item | Description | U value |
|---|---|---|
| External Wall | 100mm Cavity/ Aircrete/ 0.034 insulation | 0.25 |
| Floor | Jetfloor (80mm top sheet) | 0.15 |
| Roof | 400mm Loft | 0.11 |
| Windows | Window = 1.3 double glazed (0.46 BFRC) Patio Door = 1.4 (0.45) Front Door = 1.2 | |
| Air tightness | 4.5 | |
| Thermal Bridging | Thermally broken lintel and all calculated values | |

| House Type | DFEE/TFEE % |
|---|---|
| 3 Bed Semi | -2.92 |
| 5 Bed Det | -5.68 |

# SAP 10.3 What are your options?

## *Triple Glazing*

| Spec Item | Description | U value |
|---|---|---|
| External Wall | 100mm Cavity/ Aircrete/ 0.034 insulation | 0.25 |
| Floor | Jetfloor (80mm top sheet) | 0.15 |
| Roof | 400mm Loft | 0.11 |
| Windows | Window = 0.86 double glazed (0.40 BFRC) Patio Door = 0.89 (0.37) Front Door = 1.2 | |
| Air tightness | 4.5 | |
| Thermal Bridging | Thermally broken lintel and all calculated values | |

| House Type | DFEE/TFEE % |
|---|---|
| 3 Bed Semi | 6.41 |
| 5 Bed Det | 3.48 |

# SAP 10.3 What are your options?

## *125mm Cav*

| Spec Item | Description | U value |
|---|---|---|
| External Wall | 125mm Cavity/ Aircrete/ 0.034 insulation | 0.21 |
| Floor | Jetfloor (80mm top sheet) | 0.15 |
| Roof | 400mm Loft – 500mm for 5 Bed | 0.11/0.09 |
| Windows | Window = 1.3 double glazed (0.46 BFRC) Patio Door = 1.4 (0.45) Front Door = 1.2 | |
| Air Tightness | 4.5 | |
| Thermal Bridging | Thermally broken lintel and all calculated values | |

| House Type | DFEE/TFEE % |
|---|---|
| 3 Bed Semi | 2.47 |
| 5 Bed Det | 0.94 |

# SAP 10.3 What are your options?

## *150mm Cav*

| Spec Item | Description | U value |
|---|---|---|
| External Wall | 150mm Cavity/ Aircrete/ 0.034 insulation | 0.18 |
| Floor | Jetfloor (80mm top sheet) | 0.15 |
| Roof | 400mm Loft | 0.11 |
| Windows | Window = 1.3 double glazed (0.46 BFRC) Patio Door = 1.4 (0.45) Front Door = 1.2 | |
| Air tightness | 5.00 | |
| Thermal Bridging | Thermally broken lintel and all calculated values | |

| House Type | DFEE/TFEE % |
|---|---|
| 3 Bed Semi | 4.83 |
| 5 Bed Det | 2.31 |

# SAP 10.3 What are your options?

## *Timber Frame + Double Glazing*

| Spec Item | Description | U value |
|---|---|---|
| External Wall | Timber Frame | 0.19 |
| Floor | Jetfloor (80mm top sheet) | 0.15 |
| Roof | 400mm Loft | 0.11 |
| Windows | Window = 1.3 double glazed (0.46 BFRC) Patio Door = 1.4 (0.45) Front Door = 1.2 | |
| Air tightness | 4.5 | |
| Thermal Bridging | Thermally broken lintel and all calculated values | |

| House Type | DFEE/TFEE % |
|---|---|
| 3 Bed Semi | 2.47 |
| 5 Bed Det | 0.67 |

# Case Study

- 3 Storey Apartment Block

# SAP 10.3 What are your options?

## *Low Rise Apartments*

| Spec Item | Description | U value |
|---|---|---|
| External Wall | Masonry 150mm Cavity, 0.034 insulation (LWA GF, 0.19 Aircrete floor 1+2) | 0.20/0.19 |
| Wall to UH corridor | Masonry | 0.25 |
| Floor | Jetfloor | 0.11 |
| Roof | 500mm Loft | 0.09 |
| Windows | Window = 1.2 double glazed (0.75g) Door to Corridor= 0.71 | |
| Air tightness | 4.5 | |
| Thermal Bridging | Thermally broken lintel and all calculated values | |

| House Type | DFEE/TFEE % |
|---|---|
| Block compliance | 1.04% |

# Thank you

# Fabric first and reactions to SAP 10.3

## Graeme Smith

**Group Design and Innovations Director**

Untypical

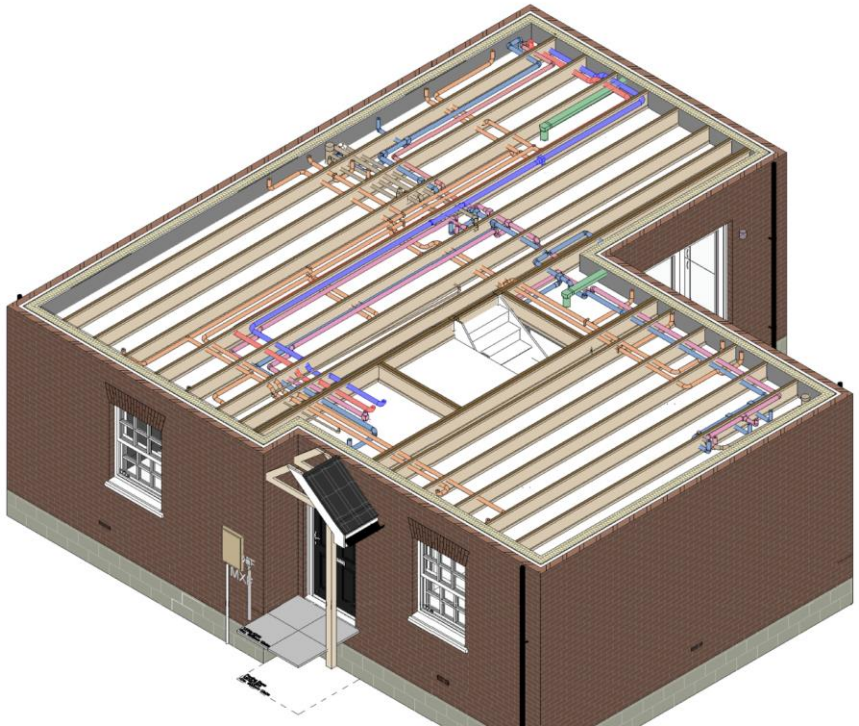
untypical GROUP | HOPKINS HOMES | TILIA HOMES

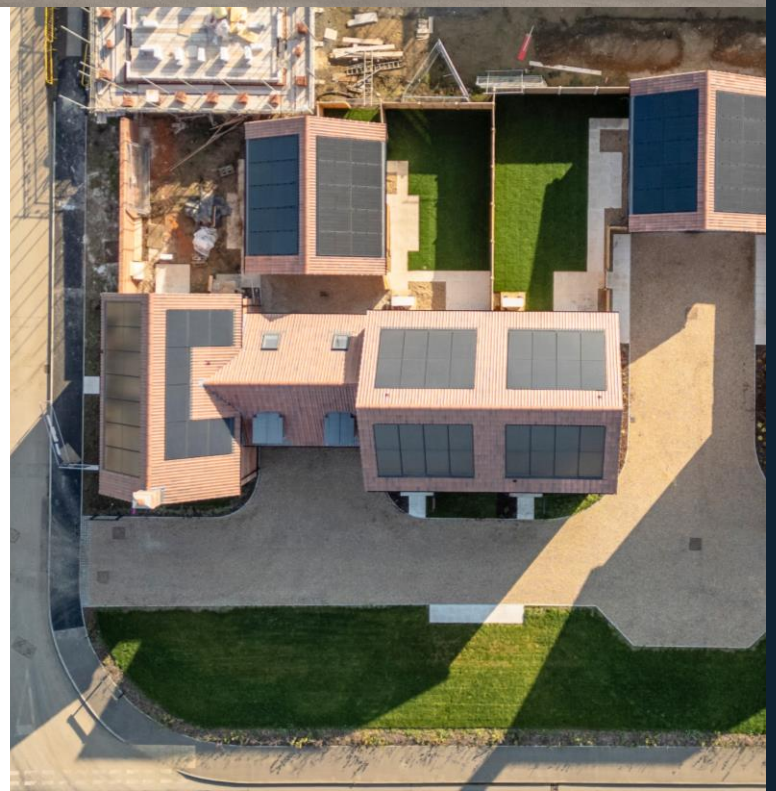
# Untypical
## SAP 10.3 & HEM

June 2026

# What are we doing.

- Test, Test, Test!
- ASHP have been tested since 2015
- dMEV current spec
- Transitioned to Timberframe specification
- Triple glazing likely (but potential offsets)
- PV & Battery Testing
- Post Occupation Evaluation



# Challenges we still see.

- Variances between DER and SAP
- Flexibility of PV requirements against planning constraints
- Apartments still a challenge, current solution still being tested

# Thank You.

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HOPKINS HOMES

TILIA HOMES

HBF Home Builders Federation

★★★★★

Customer Satisfaction 2025

PART OF THE untypical GROUP

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# All things PV

**David Adams**
**Strategic Advisor**
Future Homes Hub

**Neil Macdonald**
**Principal Technical Specialist**
NHBC

**Leigh Mason**
**Technical Director**
Clarkson Evans

**Ryan Mee**
**CEO**
Eco2Solar

**Adam Tilford**
**Technical Innovation Project Manager**
Vistry

# All things PV

## David Adams
### Strategic Advisor
Future Homes Hub

# The Future Homes Standard Essentials

## Seven actions to de-risk delivery today


1. Lead early, learn fast, share lessons
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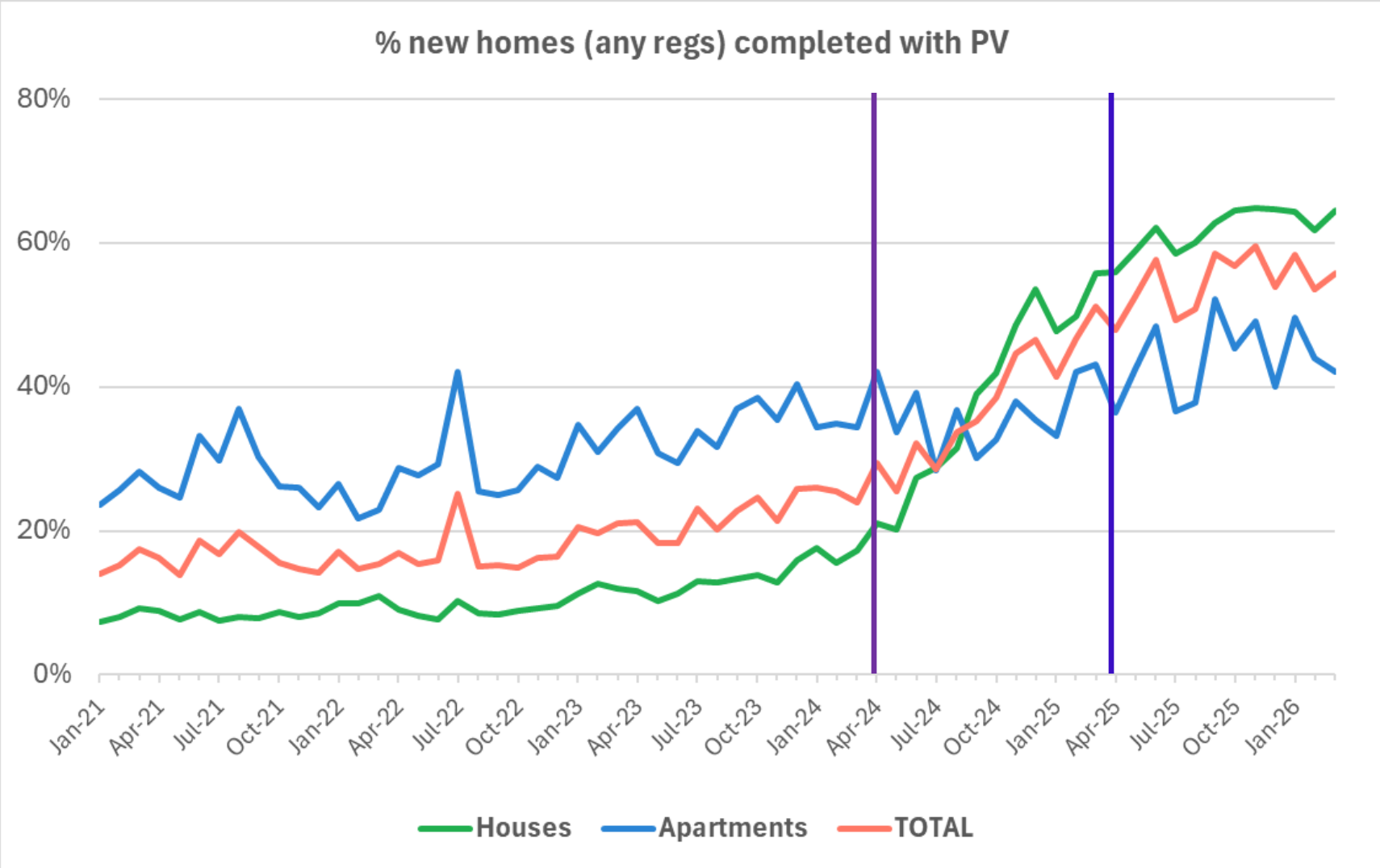
Credit: Vistry

# PV on new homes



# Part L 2026


**On-site generation of electricity**

**L2.** Where a system for on-site electricity generation is installed—

(a) reasonable provision must be made to ensure that—

(i) the system and its electrical output are appropriately sized for the site and available infrastructure;

(ii) the system has effective controls; and

(b) it must be commissioned by testing and adjusting as necessary to ensure that it produces the maximum electricity that is reasonable in the circumstances.

## Systems for on-site renewable electricity generation on dwellinghouses and buildings containing one or more dwellings

**5.69** When a new dwellinghouse or a building containing one or more dwellings is erected, the following paragraphs 5.70 to 5.78 provide guidance on how to meet requirement L3.

**5.70** When a dwellinghouse or a building containing one or more dwellings is erected and a system for on-site renewable electricity generation is required to be installed on the building or within the curtilage of the building, the minimum amount produced by renewable technologies should be equivalent to the output described in paragraph 5.73 (dwellings) or paragraph 5.74 (buildings containing dwellings).

**5.71** Renewable technologies to meet requirement L3 are not limited to being installed on the building and may also be installed within the curtilage of the building subject to the limitations described in paragraph 5.64 or other relevant constraints.

**5.72** The calculations in paragraphs 5.73 to 5.76 should use the same version of the approved methodology that is used to calculate the dwelling emission rate and dwelling primary energy rate.

**5.73** Roof-mounted photovoltaic arrays on dwellinghouses should be designed to achieve a reasonable output using one of the following.

a. An annual output (in kWh) for the dwellinghouse as calculated using the approved methodology of at least equal to that of a photovoltaic array with all of the following characteristics.

i. Installed peak power (kWp) equal to photovoltaic panels with an efficiency of 0.22kWp per $m^2$ installed over an area equivalent to 40% of the dwellinghouse's ground floor area (see equation 5.1).

ii. Orientated south-east to south-west.

iii. Pitch of 45 degrees.

iv. Not overshaded.

b. An annual output (in kWh) for the dwelling as calculated using the approved methodology at least equal to that of a photovoltaic array covering the reasonably practicable roof area with a panel efficiency of 0.22 $kWp/m^2$.

**Requirements *continued***

**Renewable electricity generation – dwellings and buildings containing dwellings**

**L3.** (1) When a building is erected which is or contains one or more dwellings, a system for on-site renewable electricity generation must be installed on the building or within the boundaries of the curtilage of the building.

(2) The system installed for the purpose of this requirement must be—

(a) designed to enable generated electricity to be available for the use of residents of the dwellings;

(b) capable of generating a reasonable output taking account of the building's design and surroundings.

(3) For the purposes of paragraph L3—

"energy from renewable sources" has the meaning given in regulation 25A;

"microgeneration" means the use for the generation of electricity of any plant (which for this purpose includes any equipment, apparatus or appliance) which in generating electricity relies wholly or mainly on energy from renewable sources;

"system for on-site renewable electricity generation" means a system for on-site electricity generation which generates electricity by microgeneration

Requirement L3 does not apply to a building—

(a) which is a relevant building for the purpose of regulation 7(4);

(b) on which it is not possible to install a system for on-site renewable electricity generation capable of generating a reasonable output on account of its design or surroundings;

or

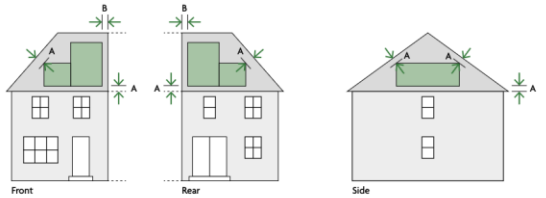
(c) where—

(i) equivalent renewable electricity generation output to that required by requirement L3 is available to the building from a system for on-site renewable electricity generation which is not on the building or within the boundaries of the curtilage of the building; and

(ii) that system is designed to enable generated electricity to be available for the use of residents of the dwellings.

**B11** Diagrams B1, B2 and B3 provide examples of layouts which maximise the area available for standard photovoltaic array installation where reasonably practicable on a variety of roof types. The capacity available (kWp) is given based on the use of photovoltaic panels with a capacity of 0.22$kWp/m^2$. The estimated annual generation (kWh) for each building will depend on the orientation of the building and should be calculated using the approved methodology.

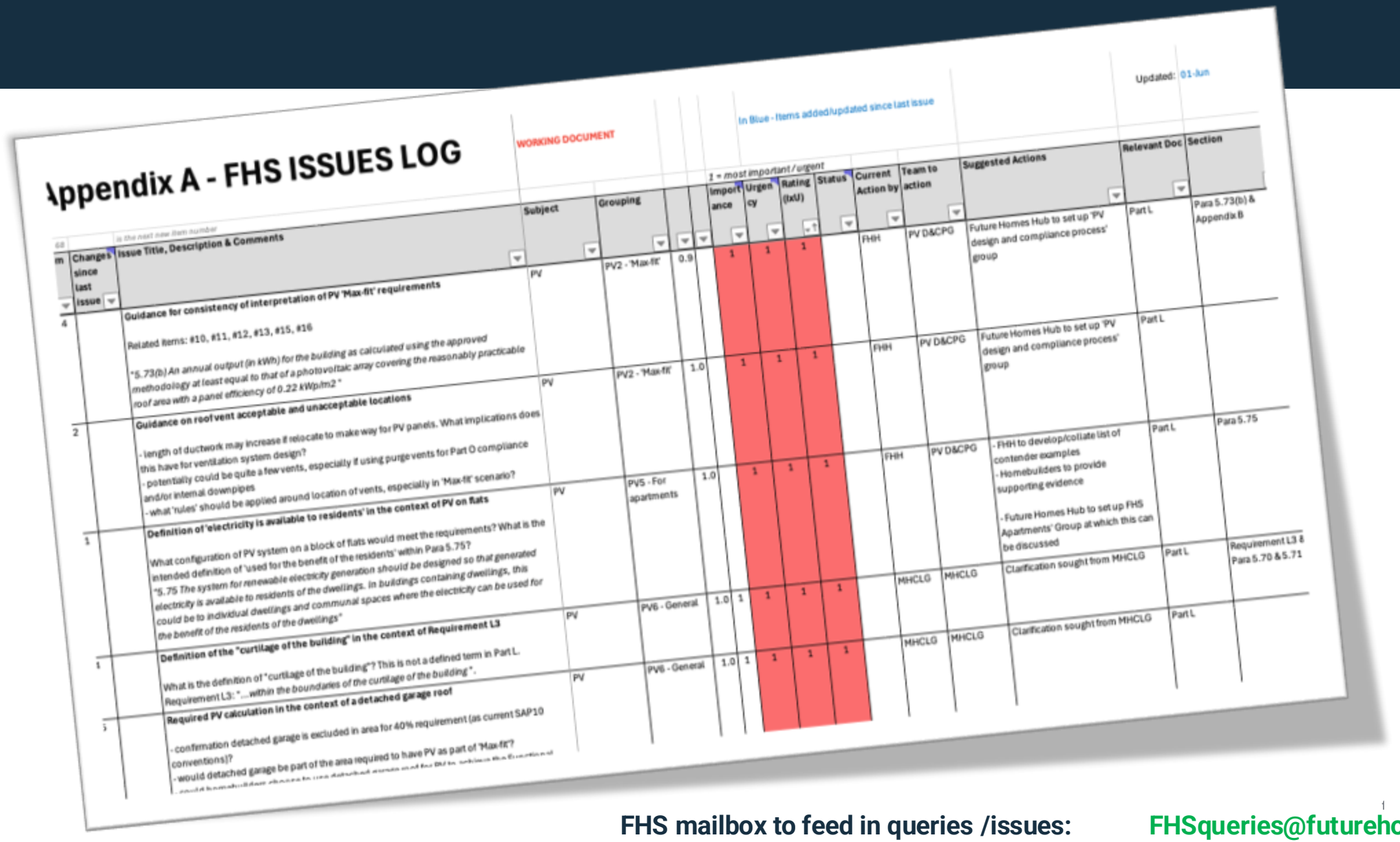
| | |
|---|---|
| Foundation area | 39$m^2$ |
| Photovoltaic area | 16$m^2$ |
| Installed capacity | 3.52kWp |




A distance between panel and closest edge of roof (mm)
B distance between panel and party wall (mm)

Diagram B1 Semi-detached or end of terrace hipped roof

# Facilitating resolution of FHS issues - Hub process



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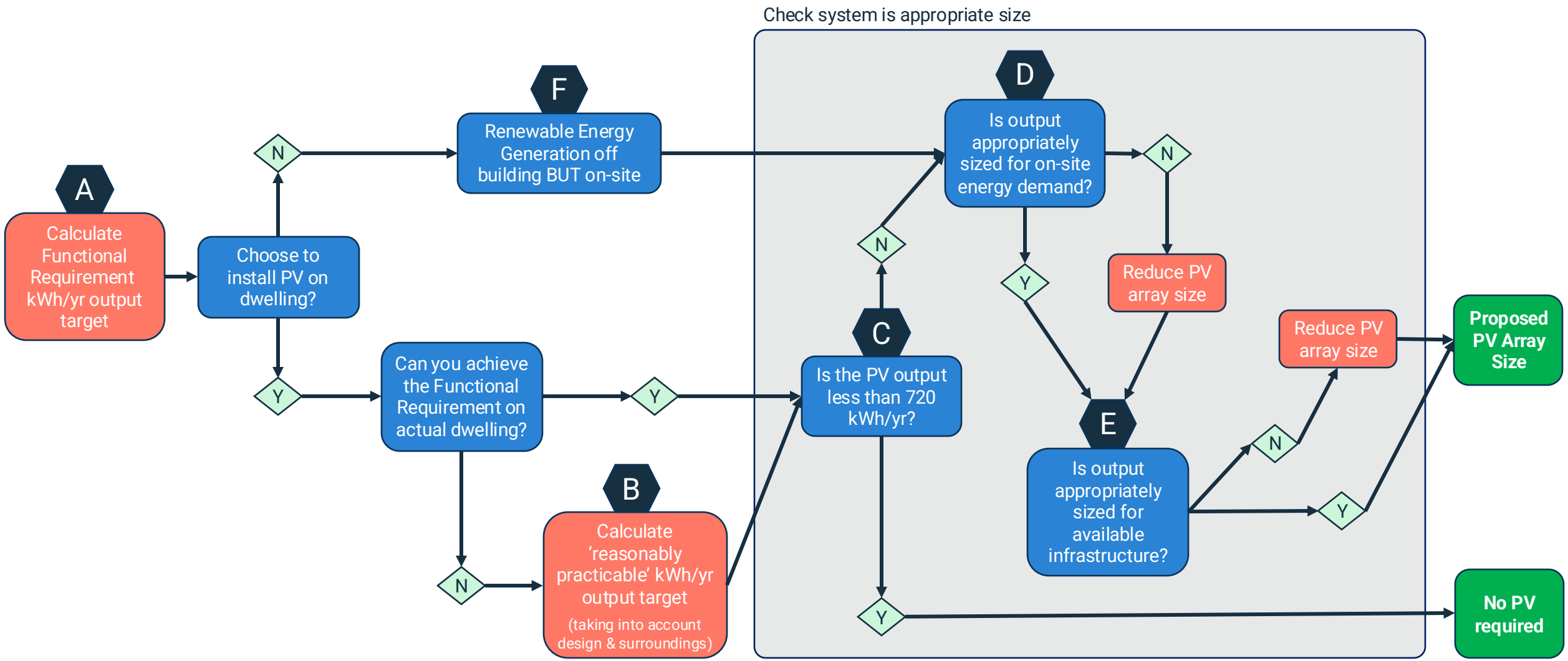
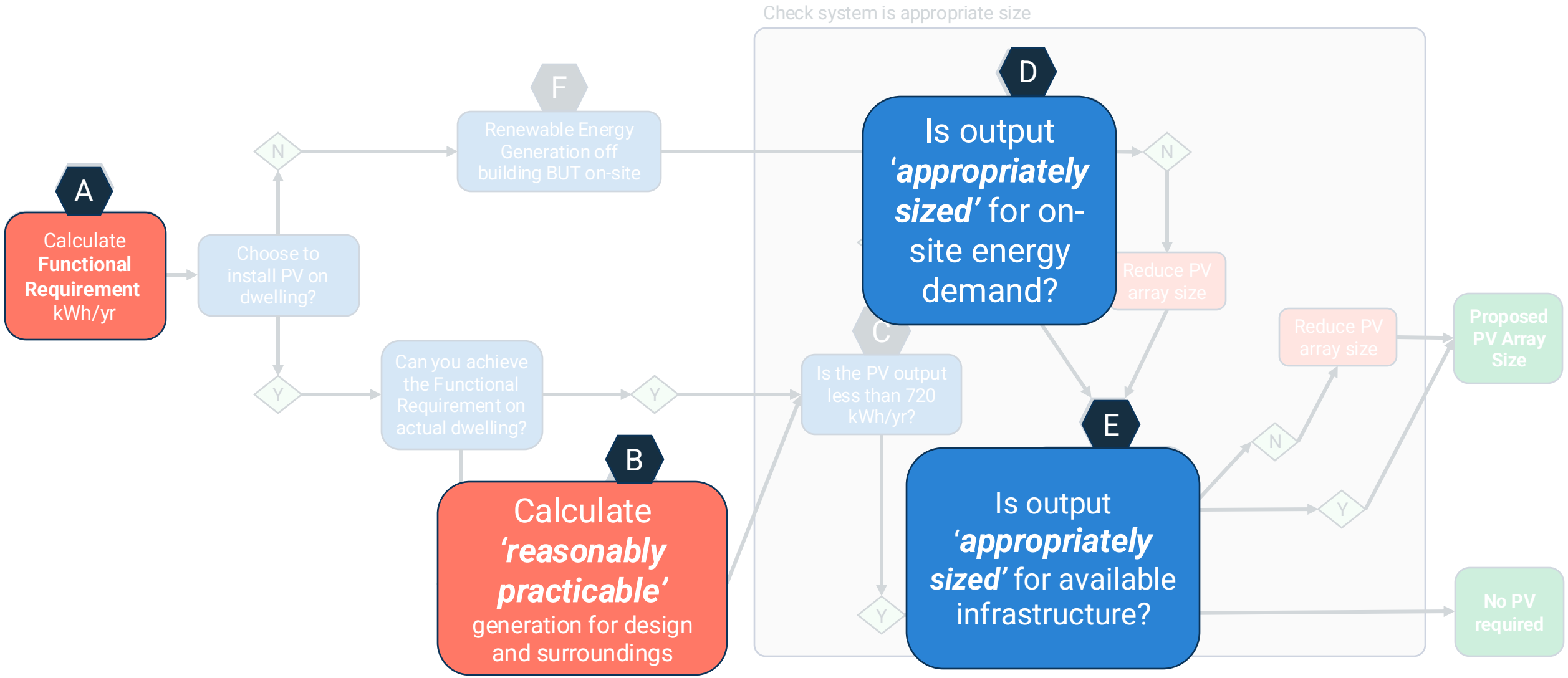
FHS mailbox to feed in queries /issues: FHSqueries@futurehomes.org.uk

# FHS PV array size calculation process overview - Houses

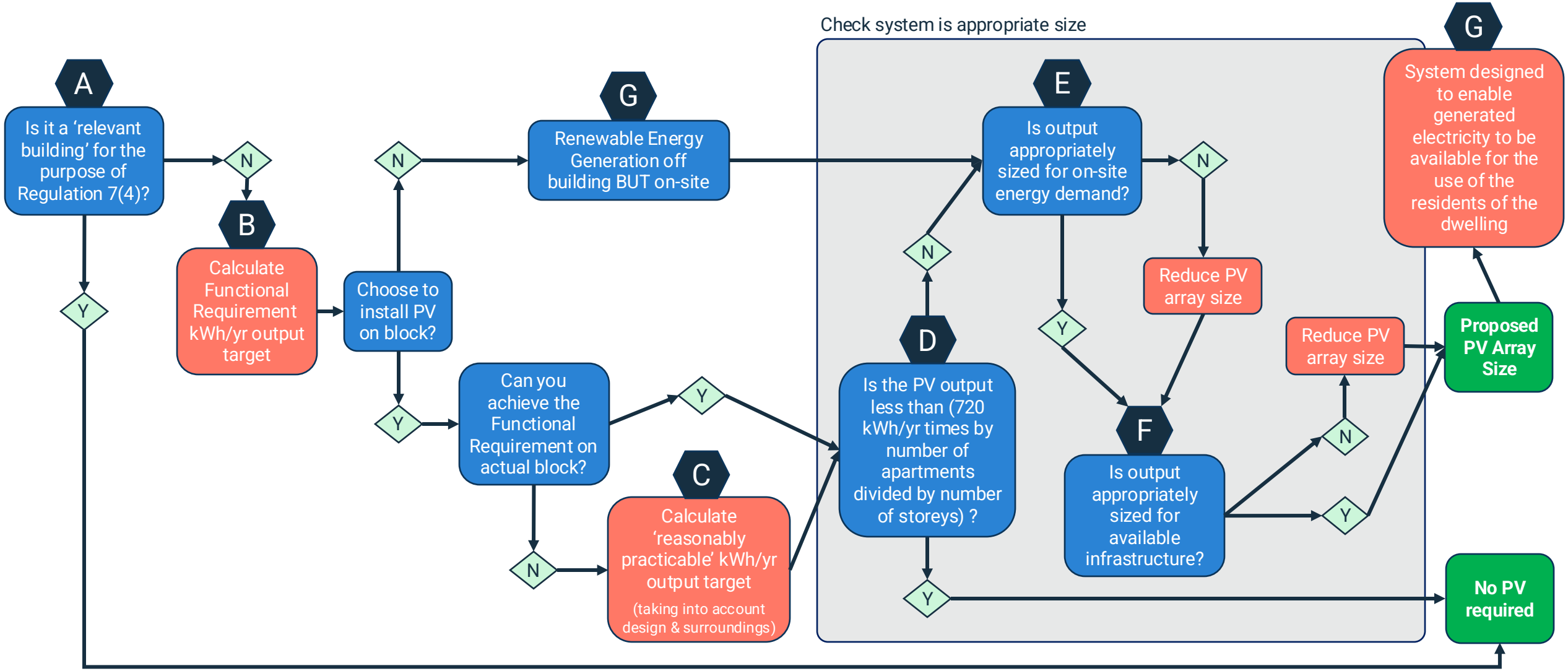


# FHS PV array size calculation process overview - Houses



# FHS PV array size calculation process overview - Apartments

Block compliance route shown



# All things PV

## Ryan Mee

**CEO**

Eco2Solar

# PV Design for the Future Homes Standard

An overview of the changes, the challenges and the best approach

# Some key information

We have been established for

**19 years**

We've installed PV on over

**72,000**

Homes across the UK

We are powered by

e·on next

We complete installations on

**1 in 5**

Houses in new build

Developers require

**X4 times**

capacity in some months

We are active on over

**600**

**Sites** around the UK

Our **NPS** is

**90**

from **site managers**

We're completing an average of

**160 fixes**

Per day

We're connecting over

**1,500 houses**

To the grid every month

eco2solar | Powered by e·on next

eco2solar | Powered by e.on next

# What Developers can expect

A complete energy partner for every stage of the development

**End-to-end delivery and a unified approach to:**

- → ICP
- → IDNO
- → Smart Meters
- → Solar PV
- → EV
- → Battery Storage

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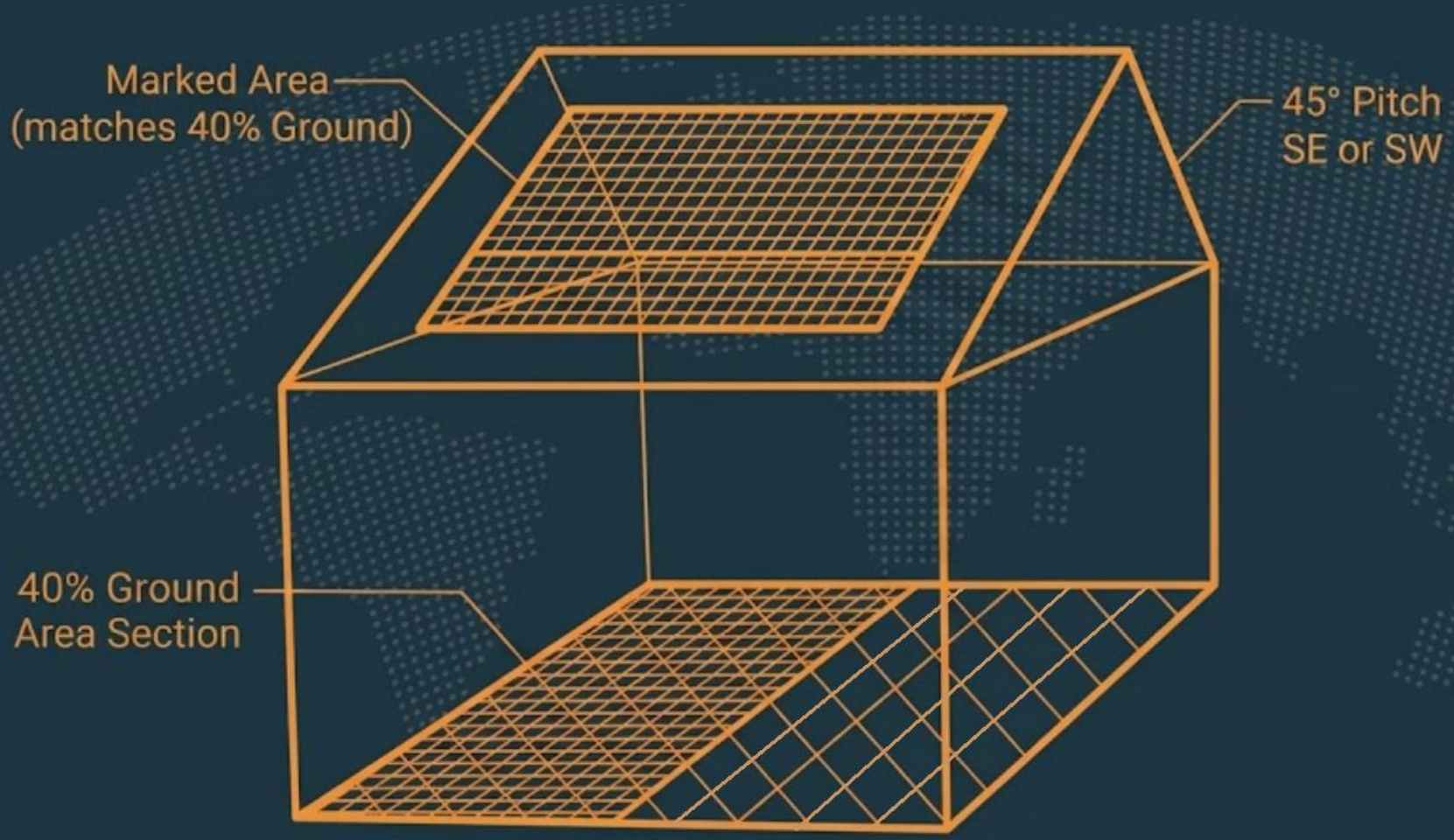
# Functional requirement calculation

- Calculate the target kWh per year using SAP 10.3 until Home Energy Model (HEM) is available
- This is based on 40% of the ground floor area in $m^2$
- PV panels with minimum output of 0.22kWp/$m^2$

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# Max-Fit approach

- Where it is not possible to achieve the functional requirement on the actual dwelling, the ‘maximum fit area’ of the roofs is drawn using the offset distances in Appendix B
- The new target is the total achievable PV output (kWh) within this area

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# Additional Considerations

- If the calculated PV output is less than 720kWh per year then no PV is required
- PV systems should be appropriately sized for the available infrastructure and on-site energy demand
- The Appendix B offset distances do not need to be adhered to for the actual installation
- Full G98 & G99 applications to the DNO will still be required
- Adding battery storage will have the greatest impact in lowering bills
- Quality, safety and compliance is key

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# Introducing The Horizon Hub

## Let us help you to understand the impact that the 40% PV factor will have on your houses and elevations as we work towards the Future Homes Standard

The transition to new standards brings complexity, from offset regulations to inverter placement. Don't guess your compliance; see it in action.

### What are our credentials?

Established in 2007 and now part of the E.ON group, we are the **UK's leading solar PV provider for new builds**, installing on 1,500 plots per month, that's one in every five new homes. As two-time HBF Subcontractors of the Year and members of the Future Homes Hub implementation group, we are passionate about leveraging our scale and expertise in PV, battery storage, and EV charging to ensure your transition to the Future Homes Standard is seamless and compliant.

## We can help you with:

### New Offset Regulations

Understand new offset regulations and the impact on achieving PV compliance

### Compliance Check

See exactly how your specific house types stack up against new standards.

### Layout Constraints

Demonstrate installation on a fully working SmartRoof and how to overcome inverter and loft location challenges.

### Navigating common pitfalls

Share our best practice advice on navigating the pitfalls of the DNO/Export Limitation/Fire classifications

### PAS Challenges

Understand new Battery Storage regulations and the impact on achieving compliance

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# Agenda for your visit

**(Morning or Lunch session)**

- Welcome followed by Coffee and Pastries or Lunch
- Overview of the pitfalls and how to navigate them
- Design exercise to show how to achieve compliance on your house types
- Working demonstration of PV systems on gable roofs and SmartRoof
- Understanding the differences between the different in-roof PV systems


**Following your visit...**

## Our experienced In House CAD team are on hand to help

Our team will be able to support you in looking at specific house types and work collaboratively to find a solution.

Together, we will navigate the technical hurdles of the Future Homes Standard to find practical, site-specific solutions that work for your commercial and technical requirements.

## Scan here to book your visit

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Making
solar
standard

# All things PV

## Adam Tilford

### Technical Innovation Project Manager

Vistry

# FHS Technical Conference

## All things PV

Adam Tilford, Technical Innovation Project Manager

Vistry

Bovis Homes Est. 1885

Linden Homes

COUNTRYSIDE Homes

Countryside Partnerships

# Understanding the PV requirement

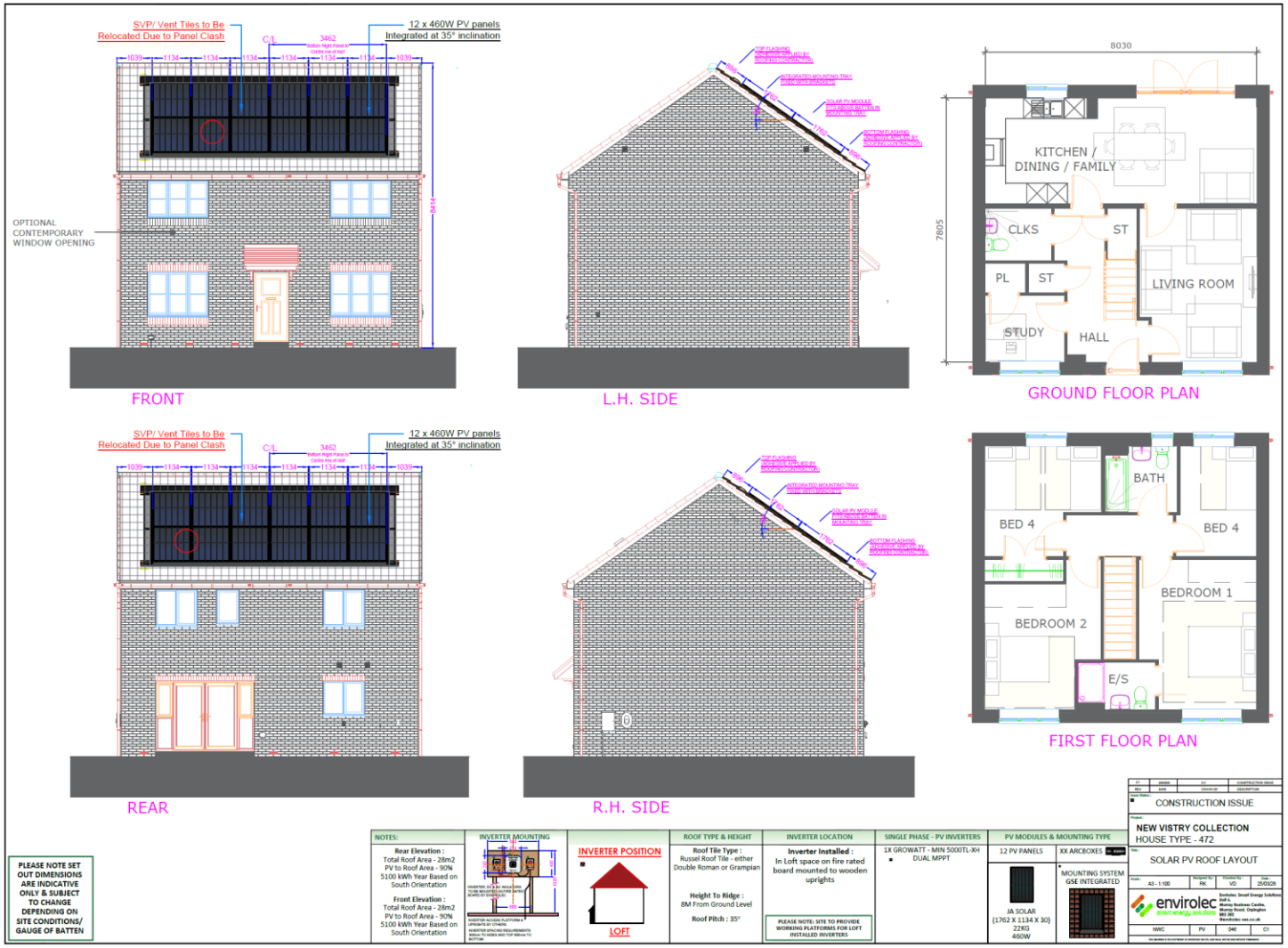
- Amount of PV necessary to deliver the FHS
- Best fit → Part L
- Exclusion zones → Part B

# Understanding the PV requirement

- NHBC requirements
- Grid requirements
- Experience from low and zero carbon, and zero bill sites informs FHS approach

# Design – New Vistry Collection

- Robust 3rd party design & audit of designs
- Guidance on fire required
- In roof or on roof?
- Above and beyond regulatory minimum
- ACF inverters



# Implementation

- SLA with subcontractors
- 3rd party installation
- Plot by plot photographic evidence

Vistry Group

Photovoltaic (PV) Solar contractor checklist

**Purpose**

A checklist to ensure PV contractors working on behalf of the Vistry Group are following required specification. The following checklist is to be used as a minimum to meet Vistry's high quality standards.

1. The Solar PV contractor must be registered with an Approved Contractors Scheme for renewable and electrical works e.g. MCS, NICEIC/Napit? ☐
2. Will the Solar PV contractor act on behalf of Vistry when liaising with the relevant DNOs for applying and notifying of PV connections? ☐
3. Has the Solar PV contractor instructed on Export Limitation cabling and included required devices as dictated by the DNO? ☐
4. Does the solar PV contractor take design responsibility for achieving kWp targets as issued by Vistry? ☐
5. Do the materials and equipment being installed hold relevant MCS certificates? E.g: MCS 005 - PV modules / MCS 012 - Pitched roof mounting system. ☐
6. For in-roof installations, has the entire array been tested as a single system and holds a valid MCS 012 certificate, with the installed module listed on the certificate? ☐
7. Is the inverter registered with the ENA and hold a compliant status? ☐
8. Does the inverter have internal arc fault detection (AFCI or similar) or is there a separate unit installed? ☐
9. All electrical wiring including DC cabling installed to the latest amendment of BS7671 wiring regulations and IET Code of Practice for Solar PV and EES systems. ☐
10. Does the contractor use pre-terminated MC4 solar PV flex where possible? ☐
11. Does the contractor install Arc Box protection enclosures where required? ☐
12. Is PV-Ultra SWA or mechanically protected Solar PV flex installed where DC circuits are buried within the building fabric as per IET Code of Practice? ☐
13. Does the solar PV contractor have a suitable QMS in place to the minimum requirements of MCS standards? ☐
14. Will the Solar PV contractor provide electrical installation certificates for the connection of the PV inverter and initial verification of the AC circuit in accordance with MCS standards and latest amendment of BS7671 wiring regulations? ☐
15. Will the Solar PV contractor produce full customer handover packs in-line with MCS standards including: warranties, data sheets, user manuals, G98/G99 commissioning and customer handover documents? ☐
16. Has the solar PV contractor read and understood the minimum requirements set out in the *above* and Vistry's *Photovoltaic (PV) Solar Panels Fire Safety Technical Report* issued February 2023? ☐

Sub-Contractor _____ Signature _____

Name _____ Date _____

# Customer benefits

- Awareness and education
  - Customers
  - Our customer facing teams
- Reduced energy cost *and*
- Managing expectations
- Sales opportunity → battery upgrade
- Maintenance of systems
- Opportunities to manage summer comfort

# Thank you

Vistry

Bovis Homes Est. 1885

Linden Homes

COUNTRYSIDE Homes

Countryside Partnerships

# All things PV

**David Adams**
**Strategic Advisor**
Future Homes Hub

**Neil Macdonald**
**Principal Technical Specialist**
NHBC

**Leigh Mason**
**Technical Director**
Clarkson Evans

**Ryan Mee**
**CEO**
Eco2Solar

**Adam Tilford**
**Technical Innovation Project Manager**
Vistry

# Future Homes Standard Technical Conference

Sponsored by e.on next

# NETWORKING BREAK

## Coming up next…
## Feeling the heat: part 1




Be sure to share your experience on LinkedIn using #FHSReady

# Feeling the heat: part 1

**Dan Neasham**
**Head of Sustainability and Performance**
Future Homes Hub

**Phil Clarke**
**Head of Operations & System Design**
PCL Net Zero

**Dan Hastings**
**Group Technical & Innovation Manager**
Barratt Redrow

**Dan Roberts**
**Technical Director**
Kensa

**Youssef Safadi**
**Director of Sustainability**
Wallace Whittle

**Elizabeth Wilkinson**
**Product Director**
Groupe Atlantic

# Feeling the heat: part 1

## Dan Neasham

### Head of Sustainability and Performance

Future Homes Hub

# The Future Homes Standard Essentials

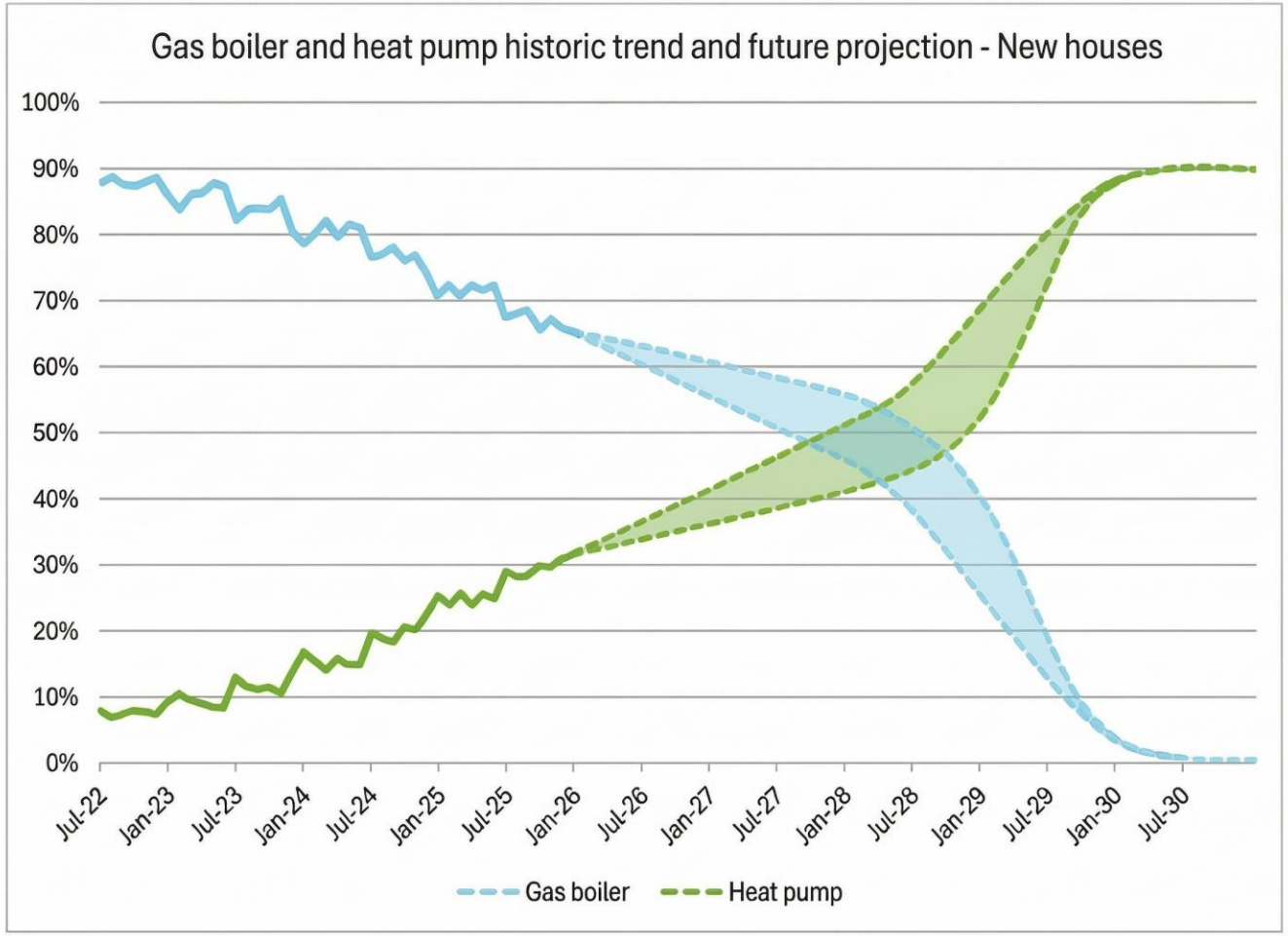
## Seven actions to de-risk delivery today


1. Lead early, learn fast, share lessons
2. Prioritise grid availability
3. Own the customer journey
4. Evolve your design
5. Get heating design right
6. Build as designed
7. Commission with care

**www.futurehomes.org.uk/future-homes-standard-ready**

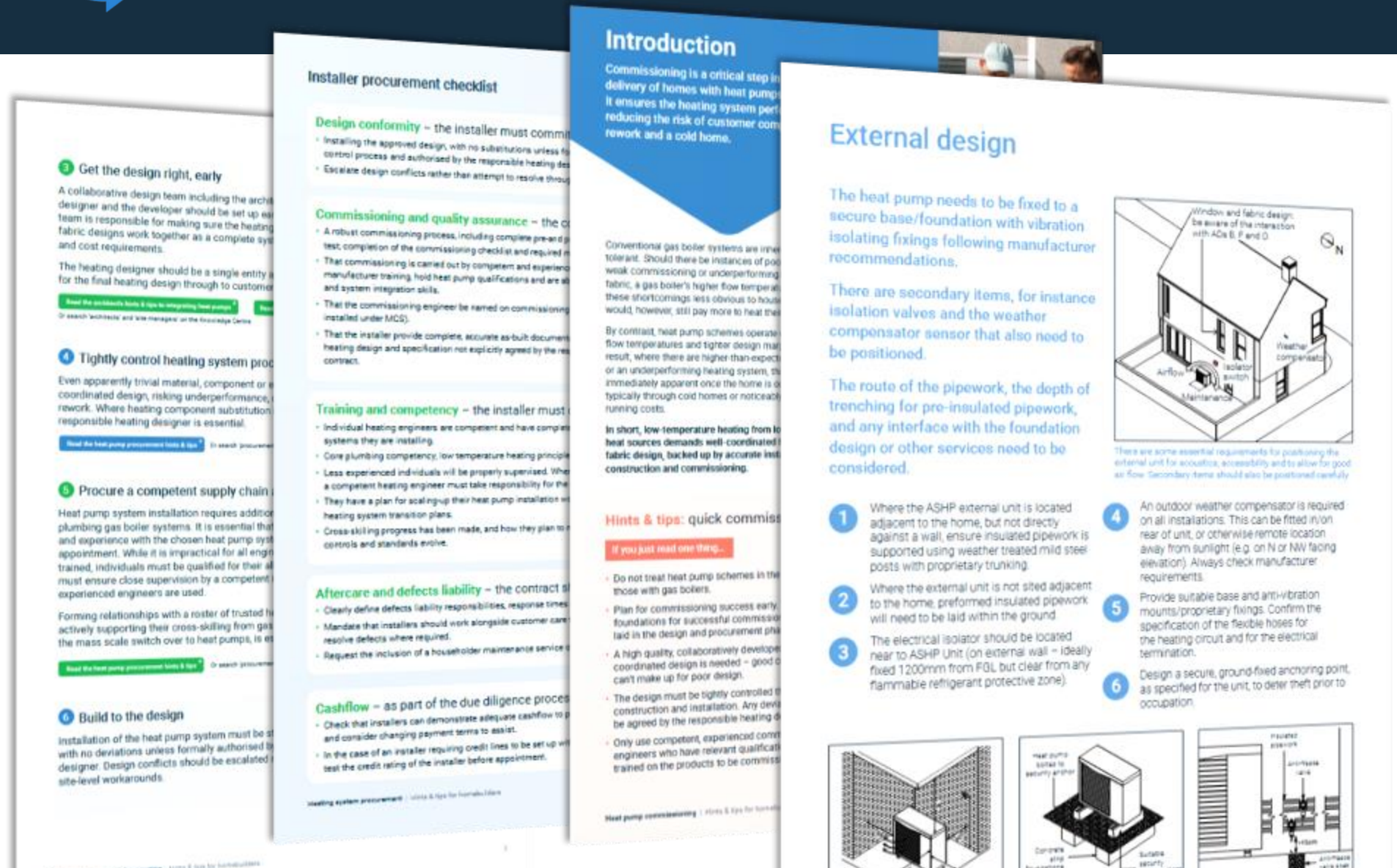
**Google: get future homes standard ready**

# The sector is already scaling up




**We must de-risk delivery in advance of adoption of heat pumps at scale under FHS**

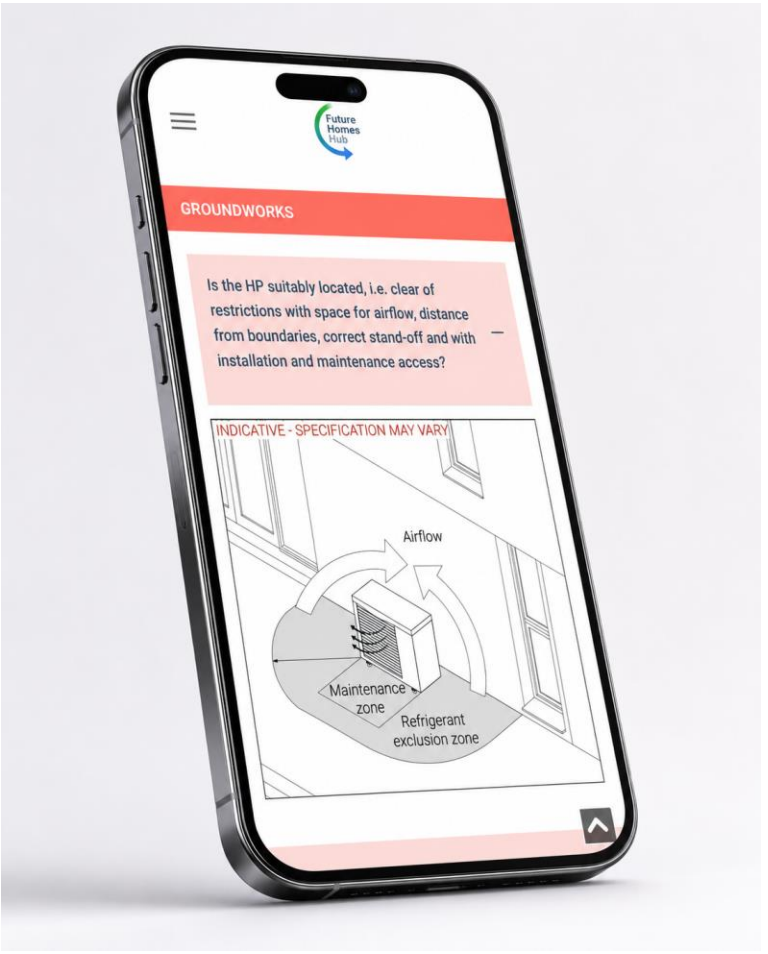
# Some of our heat pump guidance



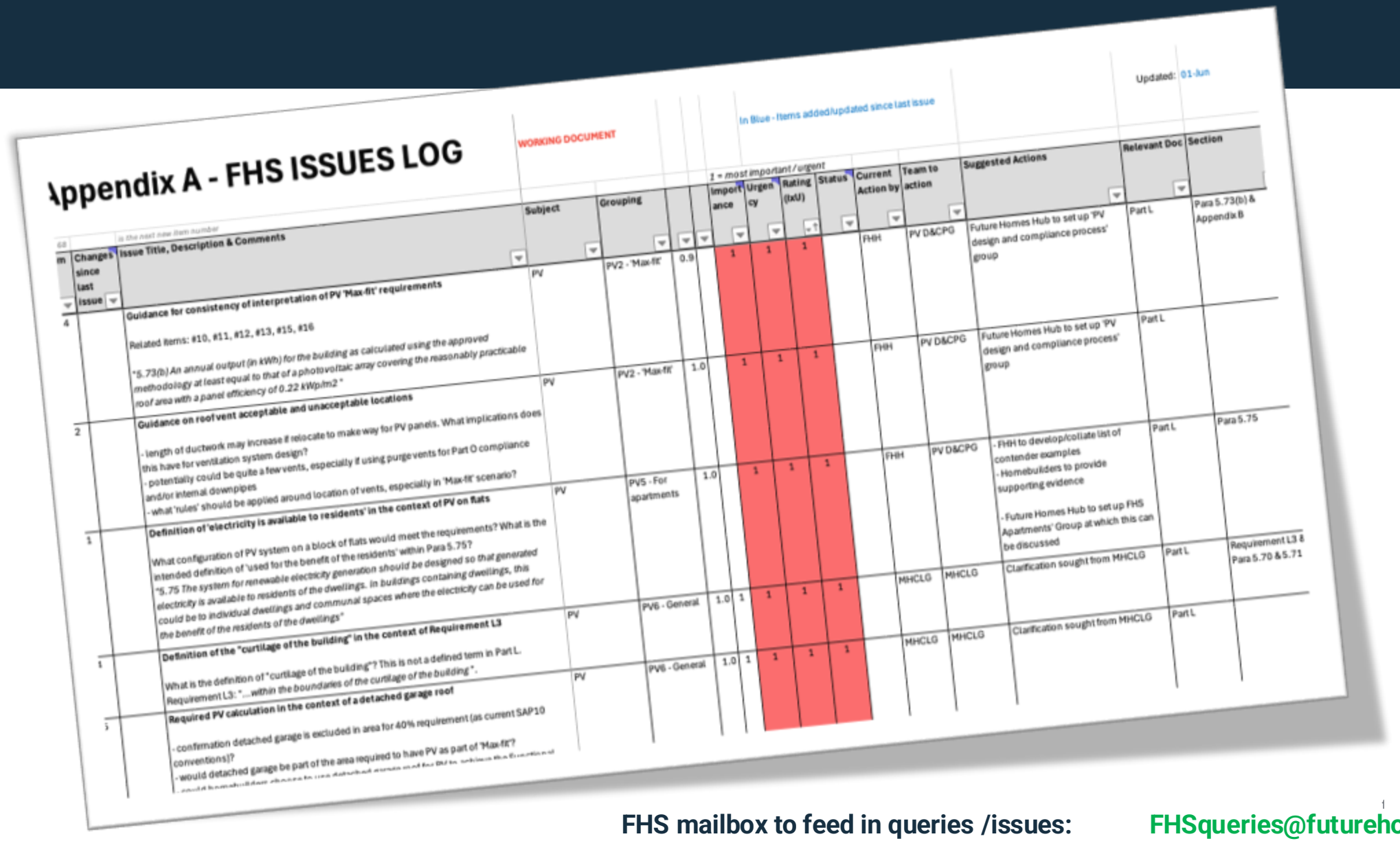

**Including:**

- Heat pump delivery guide
- Architect's heat pump hints and tips
- Heat pump procurement guide
- Heat pump commissioning guide

# Site manager’s hints and tips

# Facilitating resolution of FHS issues - Hub process



## Appendix A - FHS ISSUES LOG

WORKING DOCUMENT

In Blue - Items added/updated since last issue

Updated: 01-Jun

1 = most important / urgent

| Issue | Changes since last issue | Issue Title, Description & Comments | Subject | Grouping | | Importance | Urgency | Rating (IxU) | Status | Current Action by | Team to action | Suggested Actions | Relevant Doc | Section |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | | **Guidance for consistency of interpretation of PV 'Max-fit' requirements**<br>Related items: #10, #11, #12, #13, #15, #16<br>*"5.73(b) An annual output (in kWh) for the building as calculated using the approved methodology at least equal to that of a photovoltaic array covering the reasonably practicable roof area with a panel efficiency of 0.22 kWp/m2 "* | PV | PV2 - 'Max-fit' | 0.9 | 1 | 1 | 1 | | FHH | PV D&CPG | Future Homes Hub to set up 'PV design and compliance process' group | Part L | Para 5.73(b) & Appendix B |
| 2 | | **Guidance on roof vent acceptable and unacceptable locations**<br>- length of ductwork may increase if relocate to make way for PV panels. What implications does this have for ventilation system design?<br>- potentially could be quite a few vents, especially if using purge vents for Part O compliance and/or internal downpipes<br>- what 'rules' should be applied around location of vents, especially in 'Max-fit' scenario? | PV | PV2 - 'Max-fit' | 1.0 | | 1 | 1 | 1 | FHH | PV D&CPG | Future Homes Hub to set up 'PV design and compliance process' group | Part L | |
| 1 | | **Definition of 'electricity is available to residents' in the context of PV on flats**<br>What configuration of PV system on a block of flats would meet the requirements? What is the intended definition of 'used for the benefit of the residents' within Para 5.75?<br>*"5.75 The system for renewable electricity generation should be designed so that generated electricity is available to residents of the dwellings. In buildings containing dwellings, this could be to individual dwellings and communal spaces where the electricity can be used for the benefit of the residents of the dwellings"* | PV | PV5 - For apartments | 1.0 | | 1 | 1 | 1 | FHH | PV D&CPG | - FHH to develop/collate list of contender examples<br>- Homebuilders to provide supporting evidence<br>- Future Homes Hub to set up FHS Apartments' Group at which this can be discussed | Part L | Para 5.75 |
| 1 | | **Definition of the "curtilage of the building" in the context of Requirement L3**<br>What is the definition of "curtilage of the building"? This is not a defined term in Part L.<br>Requirement L3: "...within the boundaries of the curtilage of the building". | PV | PV6 - General | 1.0 | 1 | 1 | 1 | 1 | MHCLG | MHCLG | Clarification sought from MHCLG | Part L | Requirement L3 & Para 5.70 & 5.71 |
| 3 | | **Required PV calculation in the context of a detached garage roof**<br>- confirmation detached garage is excluded in area for 40% requirement (as current SAP10 conventions)?<br>- would detached garage be part of the area required to have PV as part of 'Max-fit'? | PV | PV6 - General | 1.0 | 1 | 1 | 1 | 1 | MHCLG | MHCLG | Clarification sought from MHCLG | Part L | |

**FHS mailbox to feed in queries /issues:** FHSqueries@futurehomes.org.uk

# Feeling the heat: part 1

## Phil Clarke

### Head of Operations & System Design

PCL Net Zero

FUTURE HOMES STANDARD TECHNICAL CONFERENCE 2026

# FEELING THE HEAT

## PART ONE

**Phil Clarke**

Head of Operations & System Design · PCL Net Zero

CENTRAL HALL WESTMINSTER · 2026

# THE FUTURE HOMES STANDARD IS VERY WELCOME.

*Finally, we have some direction.*

# Stop blaming the technology.

*Heat pumps work. The physics is sound. The efficiency potential is absolutely real.*

🔗

**Fragmented Design**

System components specified in silos - never as an integrated whole

👥

**Siloed Teams**

No shared visibility between design, procurement, and installation

📡

**Broken Communication**

Field decisions never reach the people accountable for the outcome

⚠️

**No Ownership**

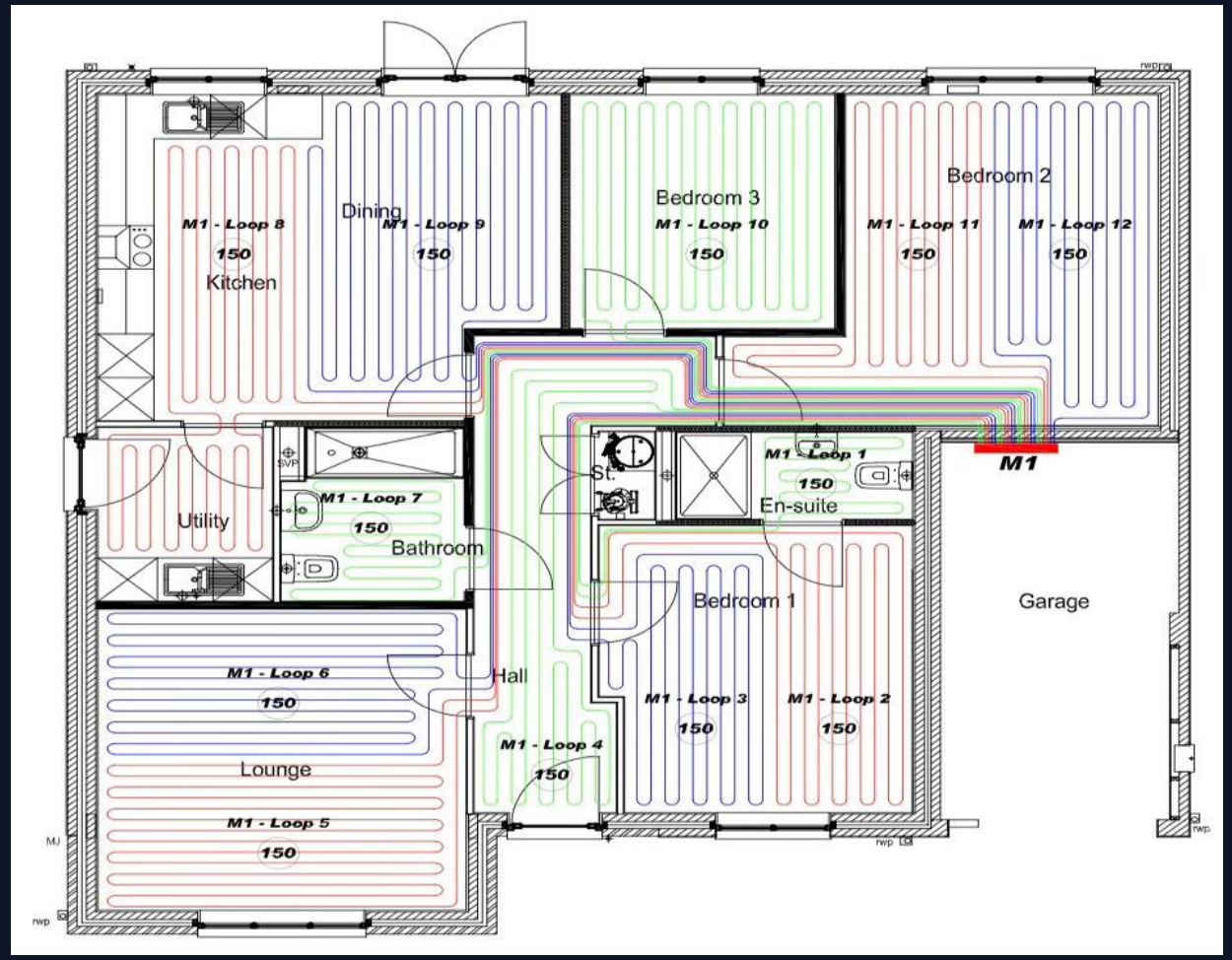
Speed and volume over quality - nobody owns the integrated result

# Eight parties.
# No single thread.


No one owning the integrated outcome — and that is before a single pipe has gone in the ground.

The housebuilder signs the warranty. The housebuilder faces the complaint.
The conditions that led to failure were created much earlier in that chain.

# Take a closer look.




## 12 zones

Every room — including en-suite, hall and store — has its own thermostat and loop. Twelve independent demand signals. No coordination whatsoever.

## No priority logic

No load balancing. No coordination with the heat pump's operating envelope. The pump short-cycles constantly. Efficiency falls off a cliff.

## One loop, two rooms

Kitchen and utility share Loop 8. Utility hits temperature, valve closes — half the kitchen turns off. The occupant turns the thermostat up. It never reaches temperature.

---

*This was a real design. It was signed off. The homeowner lived in it.*

A sub-contractor. An air source heat pump. A system designed for water.
Anti-freeze protection valves already installed. When asked why they used glycol —

# "That's what we always do."

Nobody checked. The system ran — but never as designed.

Nobody is wrong. Nobody is right. And nobody is accountable.

**That is the accountability gap.**

# The cost of getting it wrong.

NOVEMBER. NEW BUILD.

The heating **doesn't behave** as expected.

Rooms heat unevenly. The system runs noisily at 2am. Bills are **higher than the sales team suggested**.

Nobody explained at handover how a heat pump actually works - or why it runs differently to the gas boiler they've had for twenty years.

WOULD THEY RECOMMEND THIS BUILDER TO A FRIEND?

**It doesn't just cost money to fix.**
**It costs stars.**

---

The inverse is equally true. A builder known for homes warm on day one and running below expected cost — that is a competitive advantage money cannot buy.

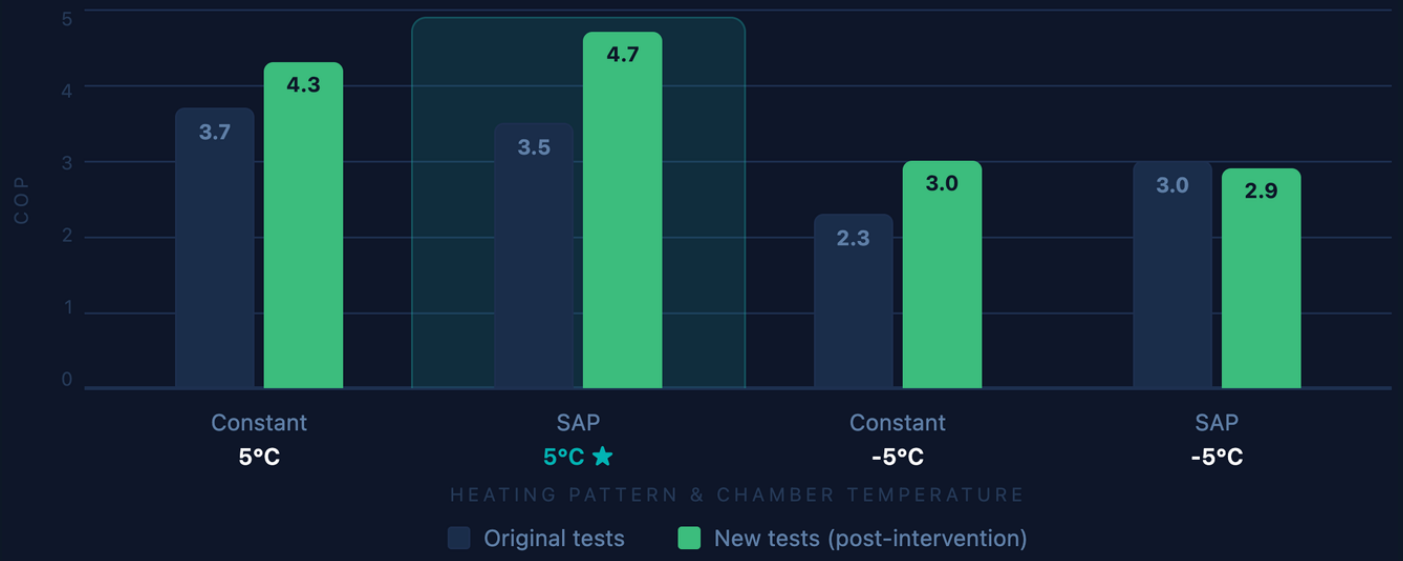
ENERGY HOUSE 2.0 | UNIVERSITY OF SALFORD | PANASONIC ASHP | BELLWAY HOMES

# 34% improvement.

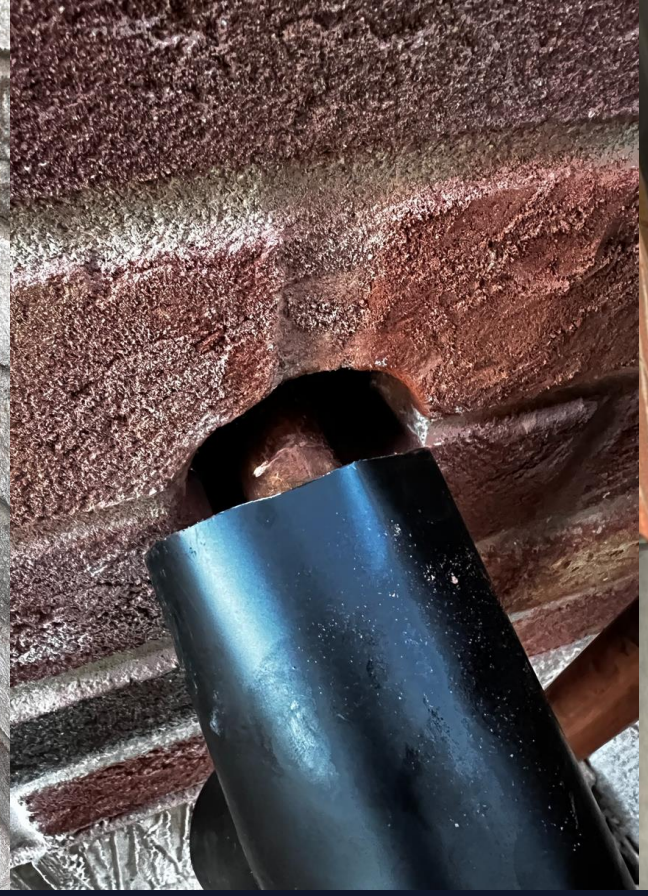
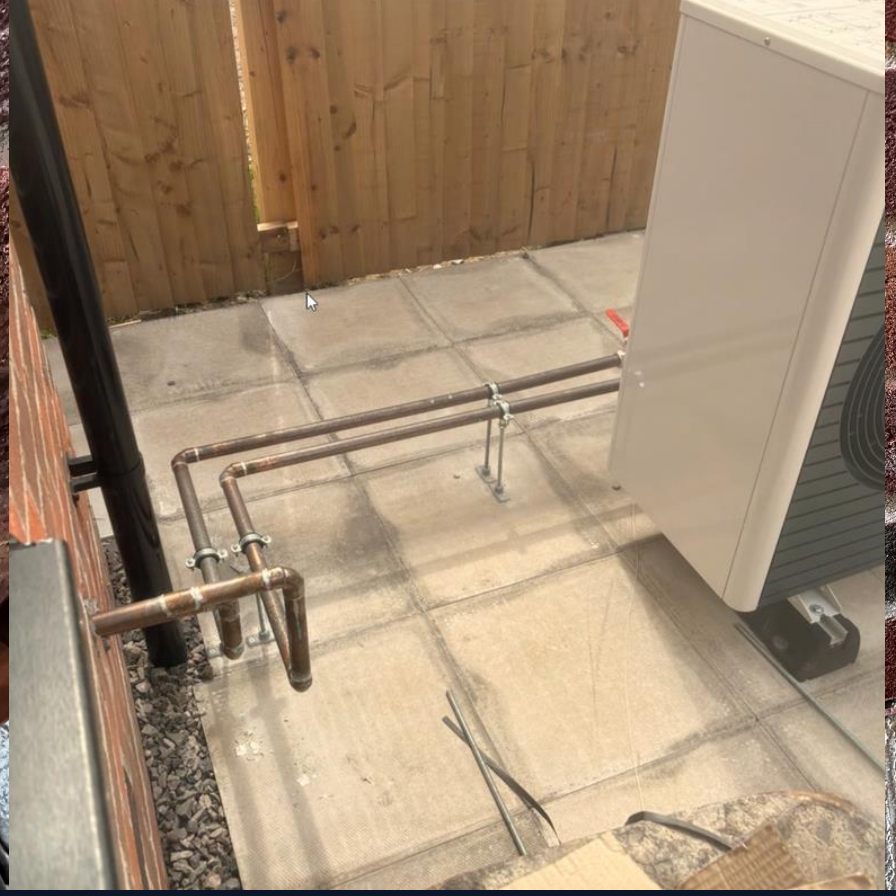
## No new equipment. £1,000 less.

### COP Comparison

SAP 5°C: +34%




No new technology. Less equipment. That is the scale of what we are losing every time a system goes in without proper commissioning. And it is entirely preventable.


# This is what a claim looks like.




# This is
# the standard.

# Cheapest and best value are not the same thing.

📋

### How it works now

Manufacturer selection is a **cost-stage decision** made by a procurement department — based primarily on what it costs on a spreadsheet.

🔧

### How it should work

Manufacturer selection should be a **design-stage decision** made with the technical team — for a fifteen to twenty year asset that carries your name.

🏭

### Lifecycle support

Parts availability for the full service life. If the brand disappears, the homeowner carries that risk. And in practice, so do you.

📄

### Subcontractor selection

Merit first — demonstrated competence, track record, relevant accreditation. Price plays a role. It must not be the only criterion.

What happens on site — several layers below where you are sitting right now — those decisions carry **your name.**

# Upskilling is not just good for standards. It is good business.

📐

**Foundation knowledge**

Engineers who understand system hydraulics and can read a design — not just install one

📞

**Confidence to flag**

Who have the confidence to pick up the phone and say: this doesn't match the drawings

📅

**Structured pathways**

CPD that is continuous and structured — not ad hoc events bolted onto a busy schedule

🔒

**Retention**

Engineers who feel invested in stay. They build expertise. They become the people who train the next generation.

Attention to detail is precisely where the biggest failings currently occur — and where the biggest gains are available.

# Not a five-minute door-drop

## with a folder nobody will read.

- ✓ **Proper walkthrough**
  Plain-English guidance on how the system works — not a document handoff
- ✓ **Weather compensation explained**
  What it is, why it is there, and why turning it off is a terrible idea
- ✓ **Seasonal expectations set**
  The homeowner who knows what to expect will not report a working system as faulty
- ✓ **Annual service plan**
  Established at handover — not left for the homeowner to work out later

**Commissioning must be against design parameters**

Not factory defaults. A signed commissioning certificate that cross-references the original calculations.

That is the standard we should all be working to.

*A heat pump installed to the highest standard will underperform if the occupant does not know how to use it.*

# The direction of travel.

The NHBC is already recording increased high-value claims linked to renewable heat.

Already — not forecast.

**Claims rise**

High-value renewable heat claims already increasing

**Premiums follow**

Warranty costs increase as claim frequency grows

**Margins compress**

Costs passed to homebuyers through higher prices

**Reputation suffers**

HBF scores fall. Every unhappy owner has a smartphone.

**Uninsurable**

Warranty providers exit. Housebuilders carry unlimited liability.

*This is not a hypothetical. It is the actuarial logic of where the current trend leads.*

# Five things.
# That's all.

1. **Integrated Design**
   DHW, heat pump, UFH and radiators as one system - owned by one accountable technical lead, from day one

2. **Design Integrity**
   Maintained from specification all the way to handover - no deviation without formal sign-off

3. **Trained Installers**
   Quality over volume - properly briefed on every project, correctly rewarded for doing it right

4. **Lifecycle Procurement**
   Manufacturer selected for long-term support capability - not just the unit price

5. **End-User Education**
   Homeowner as partner - structured handover, annual service plan, a system they actually understand

We have the regulation. We have the technology.

We have - in this room - the expertise and the genuine will to make it work.

What we need now is

# THE COHESION.

PHIL CLARKE · PCL NET ZERO · FHS TECHNICAL CONFERENCE 2026

# Feeling the heat: part 1

## Elizabeth Wilkinson
**Product Director**
Groupe Atlantic

ideal HEATING

# Feeling the Heat

Manufacturer’s perspective

idealheating.com

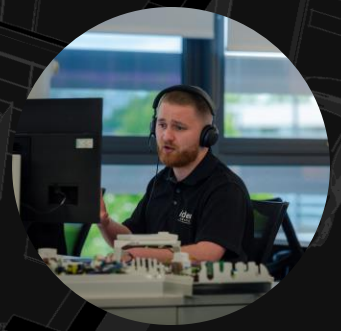
# A Manufacturer's Perspective

# Manufacturer Support


Training

Indemnified system designs

Full product suite with flexible options



Telephone and video call support


Homeowner packs and videos

Onsite assisted commissioning

Full end-user warranty breakdown support

Field support

Next-day UK stocked spare parts

# Feeling the heat: part 1

**Dan Neasham**
**Head of Sustainability and Performance**
Future Homes Hub

**Phil Clarke**
**Head of Operations & System Design**
PCL Net Zero

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**Technical Director**
Kensa

**Youssef Safadi**
**Director of Sustainability**
Wallace Whittle

**Elizabeth Wilkinson**
**Product Director**
Groupe Atlantic

# Fresh thinking on ventilation & IAQ

**Ross Holleron**
**Head of Homes and Construction**
Future Homes Hub

**Ian Mawditt**
**Development Director**
Four Walls

**Alex Naraian**
**Group Head of Technical**
Churchill Living Ltd

**Michael Swainson**
**Principal Engineer, HVAC Eng**
BRE

**Nathan Wood**
**Managing Director**
Farmwood

# Ventilation as a critical building service

## FHS Ready Essentials to de-risk delivery today


Ventilation → 7 Commission with care

1 Lead early, learn fast, share lessons

Ventilation → 6 Build as designed

2 Prioritise grid availability

5 Get heating design right

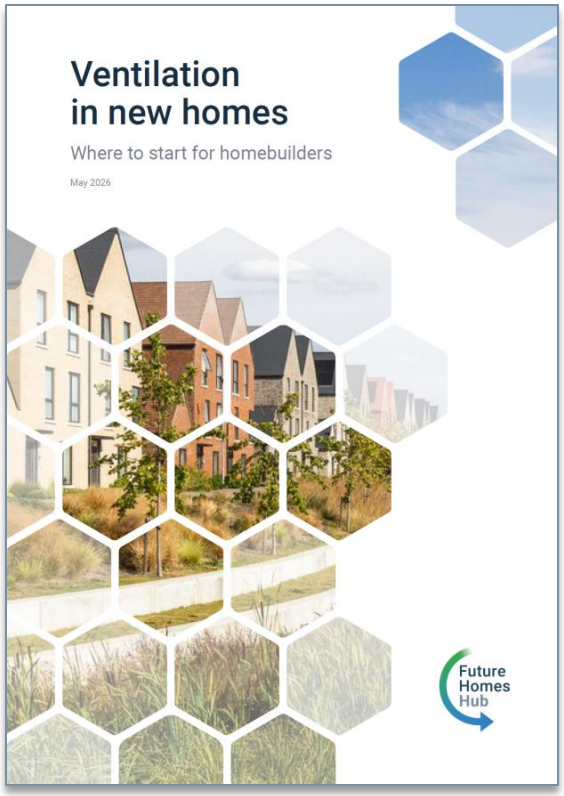
3 Own the customer journey

4

Ventilation → Evolve your design

# Ventilation in new homes

## Where to start for homebuilders




**Download it now from the FHH Knowledge Centre**

- **Supporting web page developing where you will find**
  - Examples robust design packs
  - Links to CPS and Independent training courses
  - Homebuilder case studies

SCAN ME

A Introduction

B Getting ventilation right

C Defining good ventilation design

D From design to procurement

E Installation and site coordination

F Commissioning and handover

G Verification

H Learning from homes in use

# Fresh thinking on ventilation & IAQ

## Ian Mawditt
**Development Director**
Four Walls

# Ventilation in new homes

## Where to start for homebuilders

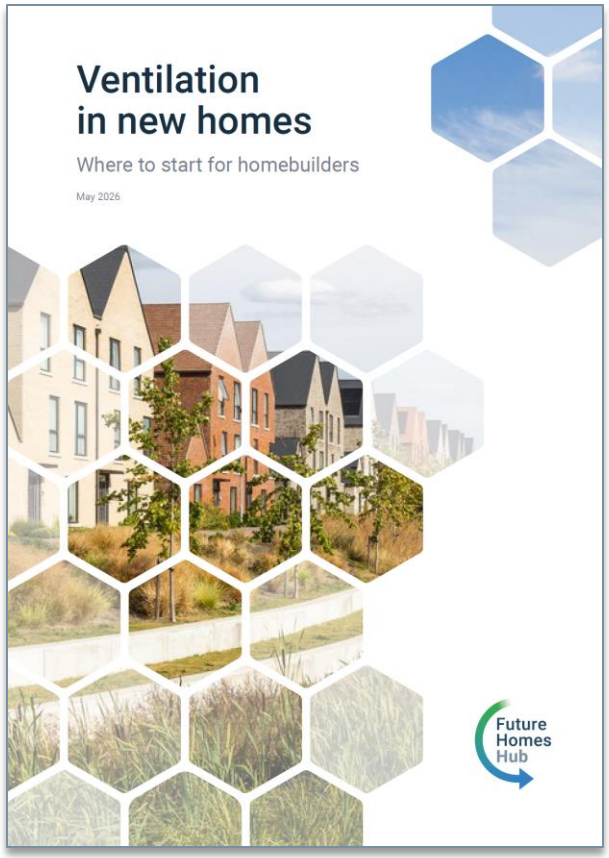
**A new guide developed from within the Ventilation Implementation Group**

### Good ventilation is essential to healthy, comfortable & energy-efficient homes

- New homes become more airtight, ventilation more critical
- If not effective, increased risk of poor indoor air quality, condensation etc
- Success is more than selecting products or meeting minimum airflow rates

### Ventilation should be treated as a critical building service

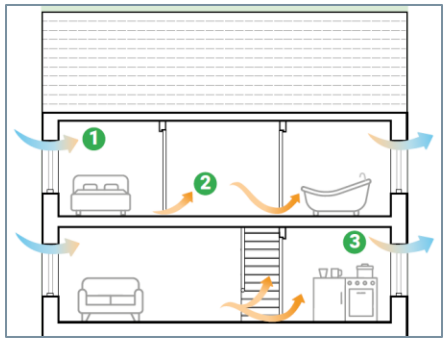
- Same as structure, fire safety, fabric & heating systems
- Considered alongside airtightness strategy
- A challenge across the entire delivery process



# Structured around main stages & key decisions

## Five good practice principles for reliable ventilation

1. Ventilation is a whole-dwelling system
2. Strategy should align with dwelling airtightness
3. A named ventilation designer should be stated
4. Installation by a competent person must follow the design
5. Measured performance should be verified



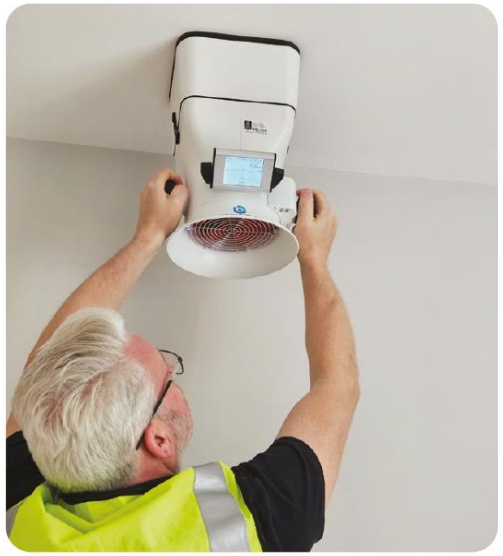

## Responsibility & competency

- Defining good design
- Design to procurement
- Installation & site coordination
- Commissioning & handover

## For ventilation systems to work:

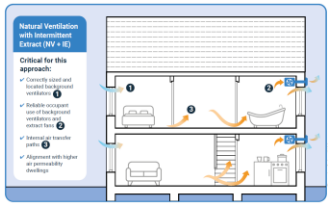
1. **Outdoor air needs to enter**
   Outdoor air must enter the dwelling through background ventilators, such as trickle vents, or mechanical supply terminals.
2. **Air needs to move through the dwelling**
   Air must move between rooms via door undercuts or transfer grilles. Obstruction of these paths disrupts airflow.
3. **Stale air needs to be removed**
   Depending on strategy, moisture and pollutants are removed via continuous extract or through a combination of background ventilators with intermittent extract.

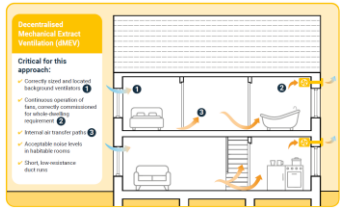
# Value of verification & learning from homes in use

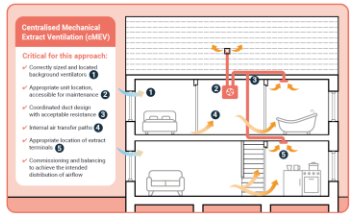


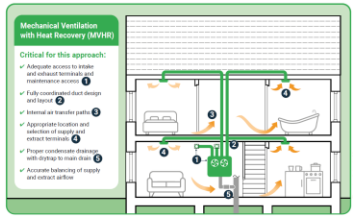
- **Independent verification**
  - Commissioning is frequently by installers
  - Verification changes behaviour
  - Taking a proportionate approach
  - CPS vs other compliance routes
- **In-use performance and occupant feedback**
  - Performance is determined in use
  - All important occupant interaction

© OX Place



# Fresh thinking on ventilation & IAQ

**Nathan Wood**
**Managing Director**
Farmwood

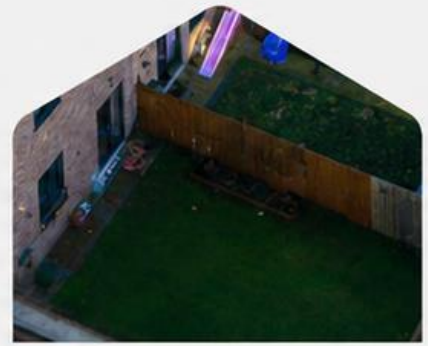
# Designer & installer insights

## What good design involves and how to deliver onsite

FHS Technical Conference

Nathan Wood

Farmwood Ltd



FARMWOOD

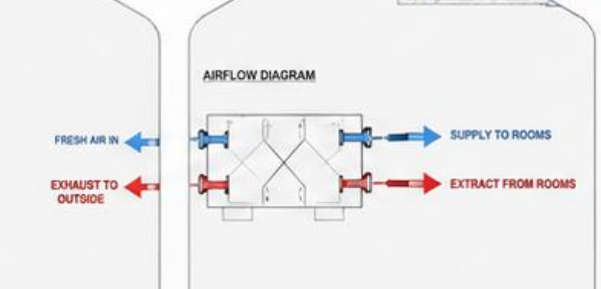
# The Wet Fish Conundrum

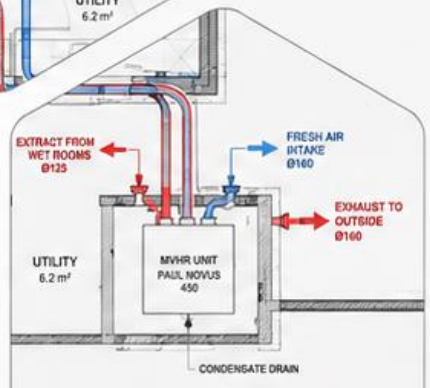
Why knowledge alone doesn’t always deliver competence onsite

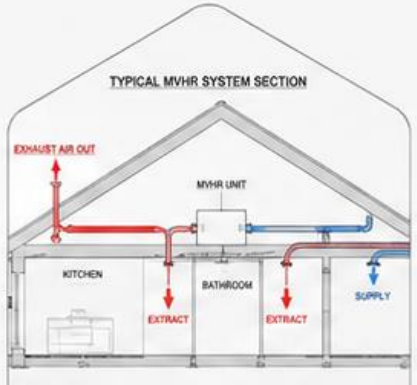
FARMWOOD

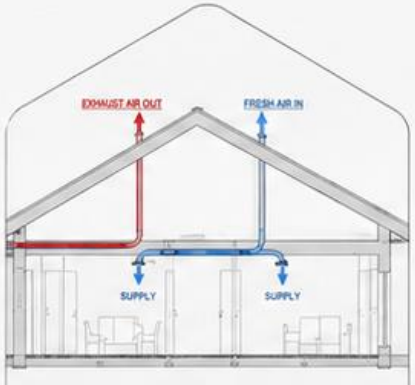
# To design or not to design

That is the question



FARMWOOD

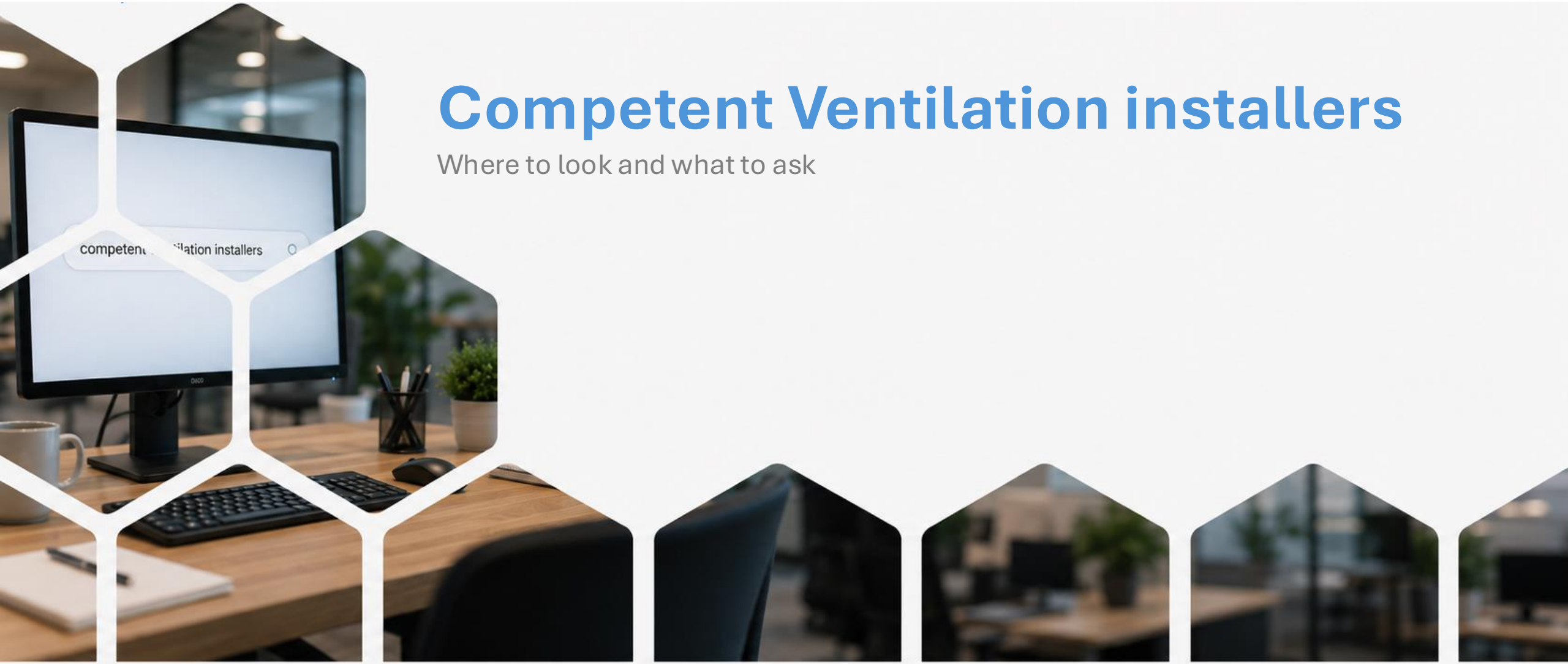
# Collaborate to Ventilate

(World Ventil8 Day theme 2025)

FARMWOOD

# Competent Ventilation installers

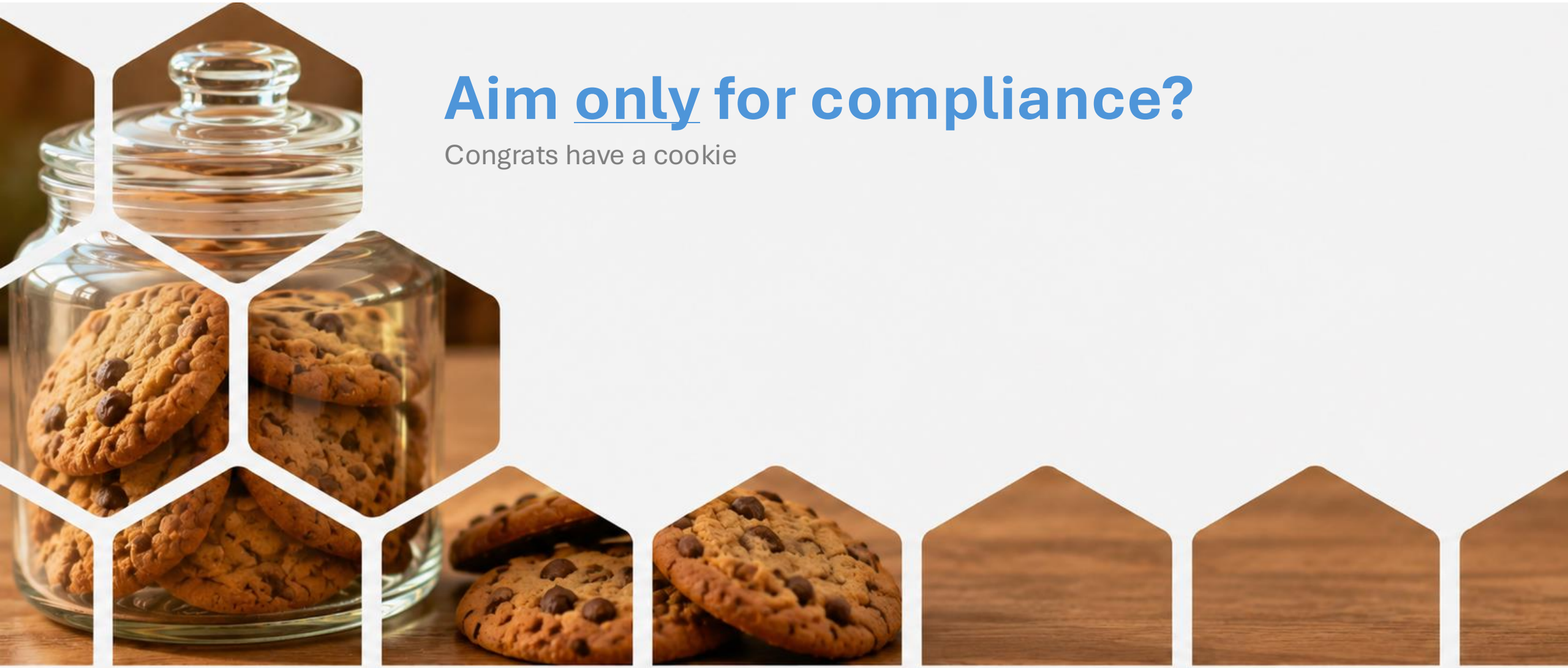
Where to look and what to ask



FARMWOOD

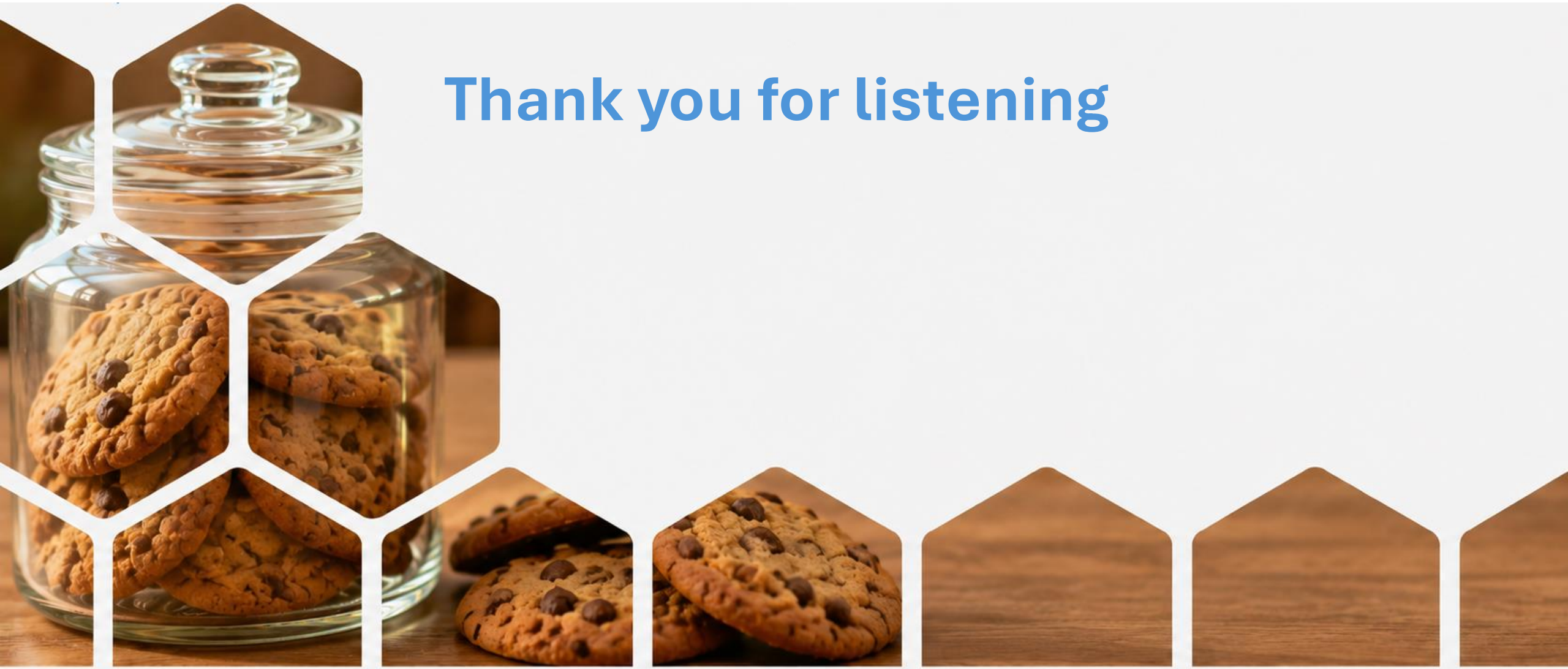
# Aim only for compliance?

Congrats have a cookie



FARMWOOD

# Thank you for listening



# Fresh thinking on ventilation & IAQ

## Michael Swainson
**Principal Engineer, HVAC Eng**
BRE

# Testing & verification

## Lessons from the field  (& decades of lab / site work)

**Michael Swainson**
**HVAC Eng**
17 June 2026

# Testing and commissioning

**Testing** the assessment of the performance of a single component, e.g. a fan.

This may be carried out prior to completion to confirm a component can meet the specification.

**Commissioning** the assessment of the whole ventilation as a system. The performance or suitability of every component is assessed.

The must be carried out when all building works have been completed, to ensure the system handed over – all doors and windows closed, all ventilation components operating.

# Stepping back – Experience gained

## Specification – ‘It’s listed on the PCDB, therefore….’

The fact that a product is listed on the PCDB does not mean that it is suitable for a given application.

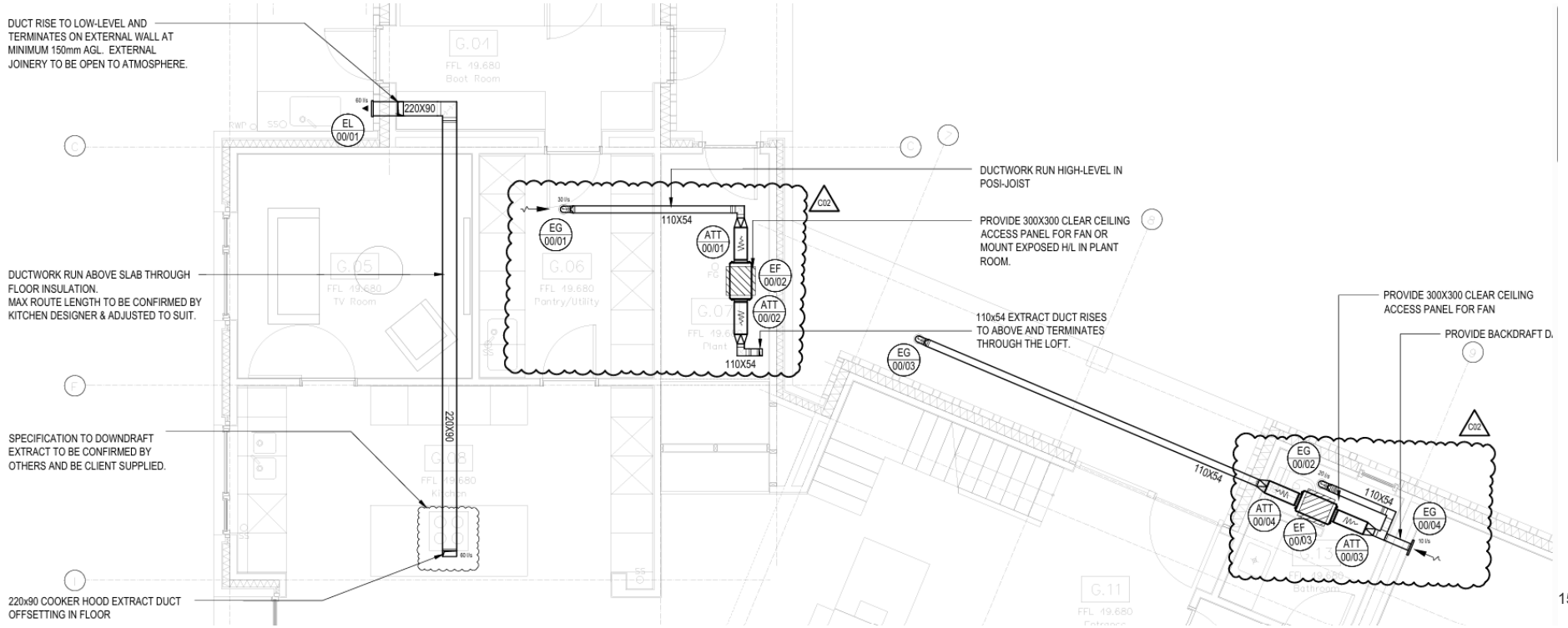
## Value Engineering – ‘It’ll do the flow rate….’

Sizing a fan to just meet the performance specification may save money, but it will result in the system being noisy, and potentially having a relatively short service life.

# Stepping back – Experience gained

## Design competence – ‘I’m a qualified engineer…’

The industry has a way to go to train designers. Currently, the only measure is experience, i.e. a proven track record.



# Verification

**Verification** is the independent assessment of the performance of a whole ventilation as a system.

The critical part is the total independence of the verifier. Free of any links to the designer, installer or commissioning engineer.

The verifier should:

– Review the design, confirming the correctness of the design air flow rates throughout the system.
– Assess the installation of all components and confirm they meet the design.
– Review the commissioning and check against the design, then make independent measurements to confirm the values.

**The is not a burden, it is an insurance policy, it removes the risk of designers/installers marking their own homework favourably and highlights systematic errors.**

| Dwelling Details | | | | |
|---|---|---|---|---|
| Floor Area | 144.6 | | Whole building ventilation rate | |
| | | | Default | 29l/s |
| Bedrooms | 4 | | 0.3l/s per m2 | 43l/s |
| Additional Occupants | 1 | | Minimum ventilation rate | 25l/s |
| | | | | |
| Extract Normal Speed | | | Extract Boost Speed | |
| | | | | |
| Kitchen | 11 | | Kitchen | 13 |
| WC | 10 | | WC | 10 |
| Bathroom | 11 | | Bathroom | 11 |
| Ensuite | 11 | | Ensuite | 11 |
| | | | | |
| Total Airflow | 43l/s | | Total Airflow | 45l/s |

| Room | Background ventilation rate (l/s) | | | Boost ventilation rate (l/s) | | |
|---|---|---|---|---|---|---|
| | Design AD-F | Design Comm. Eng. | Measured | Design AD-F | Design Comm. Eng. | Measured |
| Kitchen | 13.0 | 5 | 6.1 | 13.0 | 13 | 17.2 |
| WC | 10.0 | 5 | 7.1 | 10.0 | 6 | 19.1 |
| Bathroom | 10.0 | 5 | 3.5 | 11.0 | 8 | 12.8 |
| En-suite | 10.0 | 5 | 4.8 | 11.0 | 8 | 13.6 |
| **Total** | **43** | **20** | **21.5** | **45** | **35** | **62.7** |

**Table 3.** Comparison of measured air flow rates and those determined from the design drawings and AD-F and those taken from the Inspection and Commissioning Engineer's sheet, Plot 158.

## The design

Provided by the fan manufacturer

Air flow rates met Building Regulations

## The commissioning results

Every house had a flow rate of 5 l/s in every wet room.

Building Control are not infallible. This would have potentially led to poor IAQ in rooms or the whole house.

Verification of just one house on the site would have revealed this and the whole site could have been re-commissioned.

# Fresh thinking on ventilation & IAQ

**Ross Holleron**
**Head of Homes and Construction**
Future Homes Hub

**Ian Mawditt**
**Development Director**
Four Walls

**Alex Naraian**
**Group Head of Technical**
Churchill Living Ltd

**Michael Swainson**
**Principal Engineer, HVAC Eng**
BRE

**Nathan Wood**
**Managing Director**
Farmwood

# Future Homes Standard Technical Conference

Sponsored by e.on next

## Drinks Reception 5-6pm

## *Sponsored by* passiv

Be sure to share your experience on LinkedIn using #FHSReady

# Future Homes Standard Technical Conference

Sponsored by e.on next

# LUNCH BREAK

## Coming up next…
## Feeling the heat: part 2





Be sure to share your experience on LinkedIn using #FHSReady

# Feeling the heat: part 2

**Dan Neasham**
**Head of Sustainability and Performance**
Future Homes Hub

**Max Becker**
**Head of MEP**
Wates

**Nick Houghton-Best**
**National Head of New Build**
Daikin

**Adam Tckaz**
**Business Development Director - Sustainable Heat**
GTC

**Firat Ucer**
**Regional Sales Manager**
NIBE

# Feeling the heat: part 2

## Dan Neasham

**Head of Sustainability and Performance**

Future Homes Hub

# The Future Homes Standard Essentials

## Seven actions to de-risk delivery today

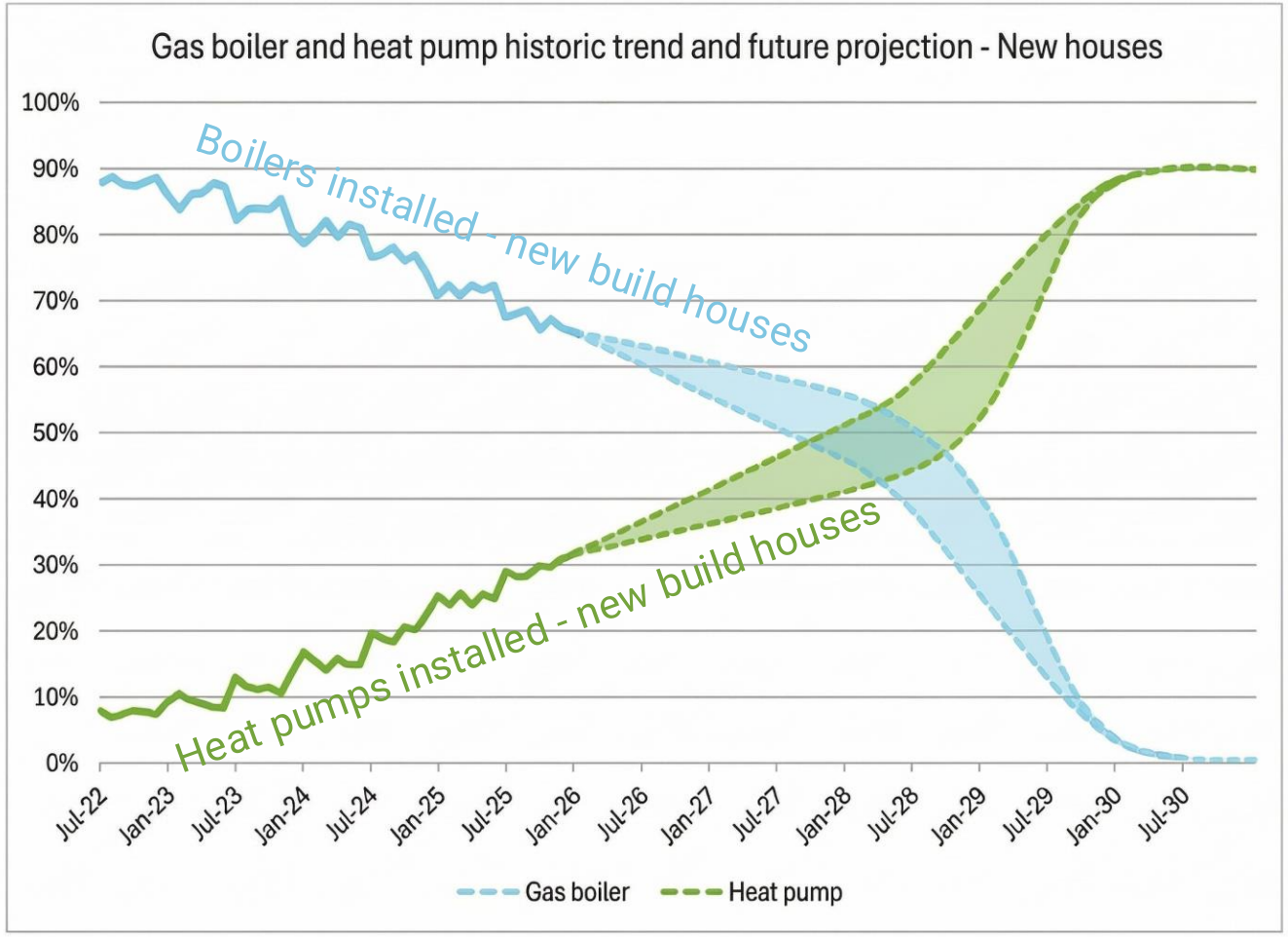

1. Lead early, learn fast, share lessons
2. Prioritise grid availability
3. Own the customer journey
4. Evolve your design
5. Get heating design right
6. Build as designed
7. Commission with care

**www.futurehomes.org.uk/future-homes-standard-ready**

**Google: get future homes standard ready**

# Future Homes Standard means no fossil fuel heating*

# The sector is already scaling up…



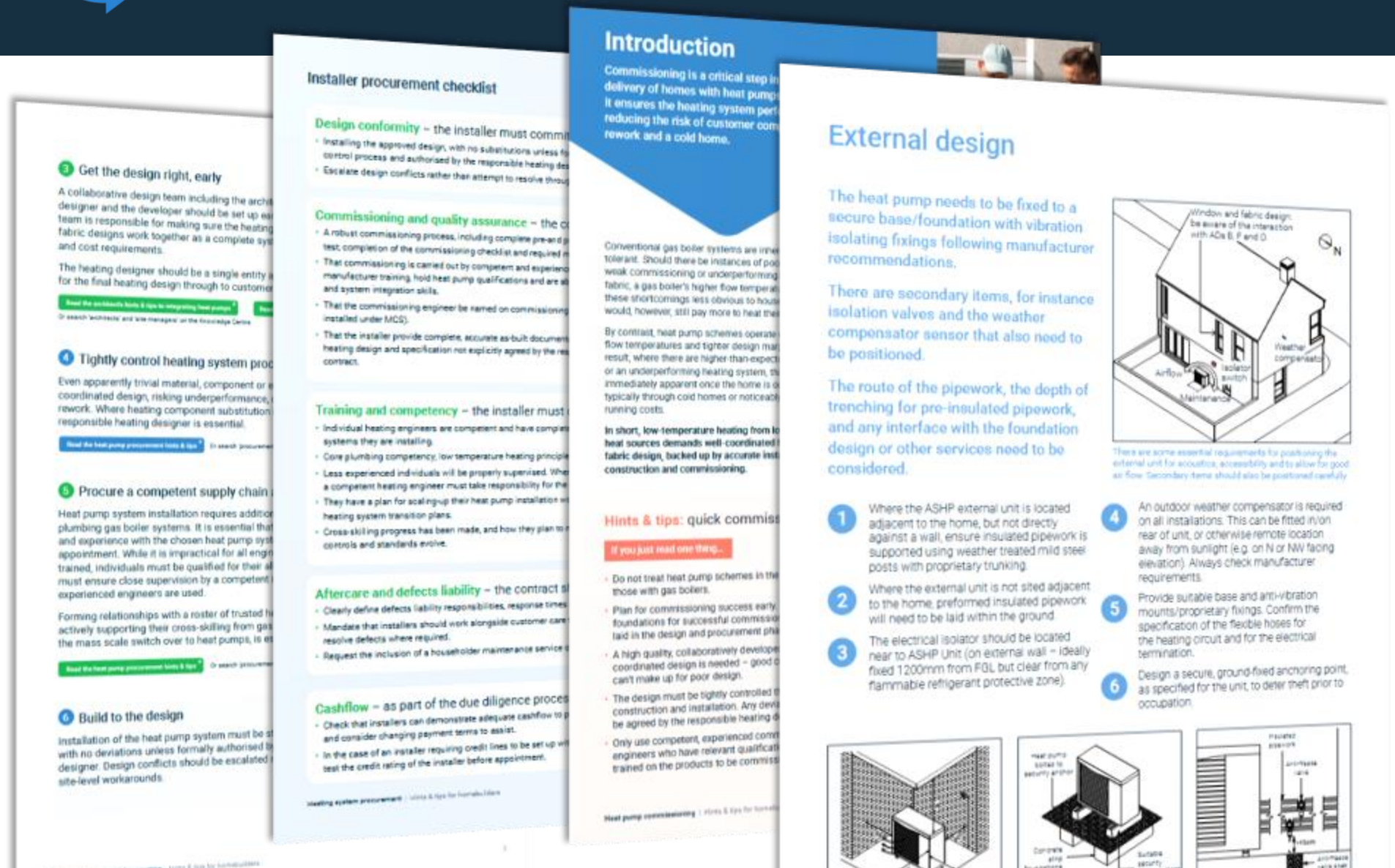

… but we must **de-risk** delivery in advance of adoption of low carbon heating at scale under FHS

Monoblock heat pumps and heat networks are **not the only viable low carbon solutions** for low and high density developments

In all cases, it is essential to avoid designing as an afterthought:

- **Assess** which is the right solution
- Do the **design and coordinate** up front
- Always think of the **end customer**

# Some of our heat pump guidance




**Including:**

- Heat pump delivery guide
- Architect's heat pump hints and tips
- Heat pump procurement guide
- Heat pump commissioning guide

**Non-heat pump solutions guidance on the way**

# Heating solutions focus 1/2

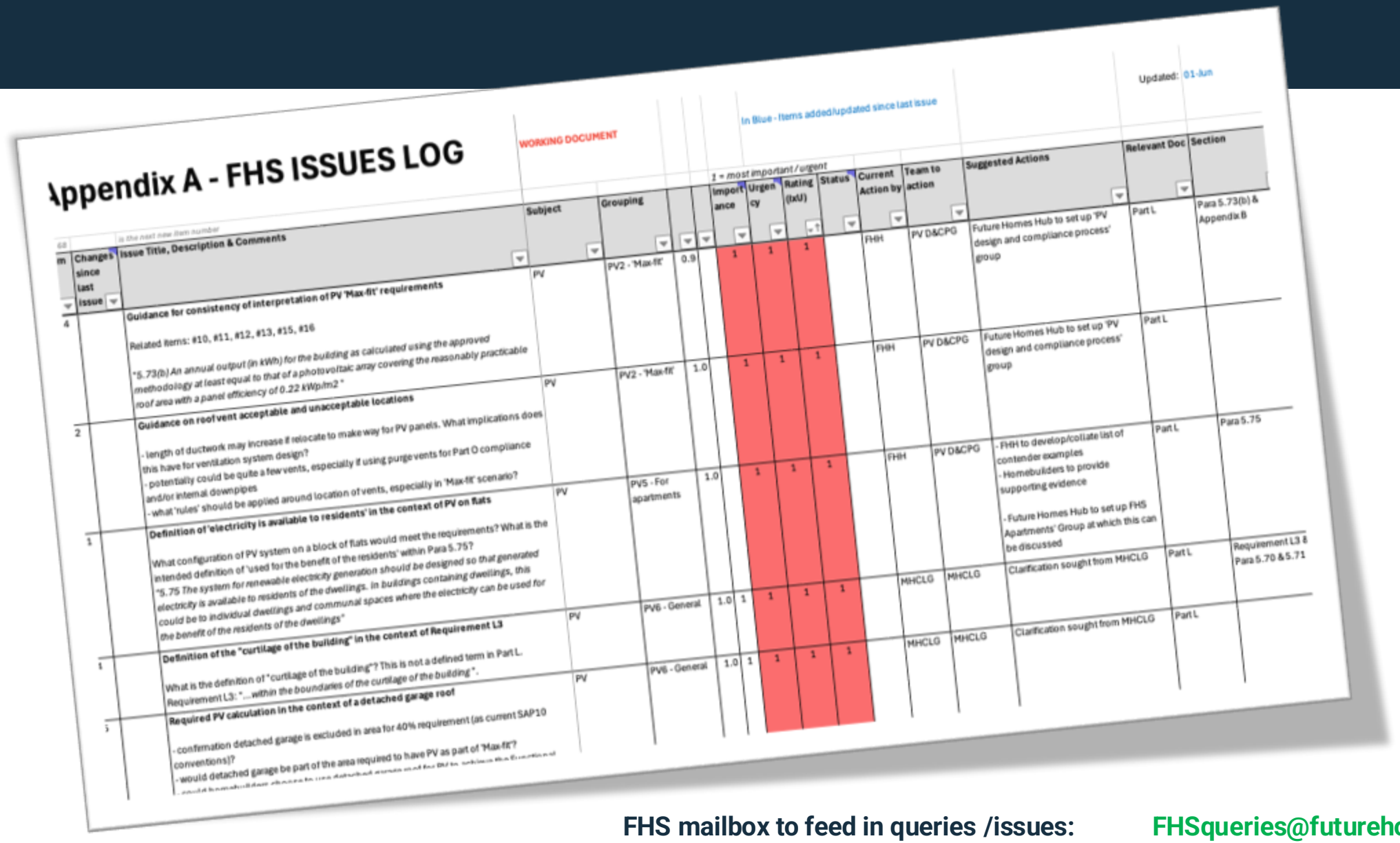
- Exhaust air heat pump
- Hot water heat pump
- Smart hot water cylinders
- Direct electric heating
- Infrared heating

# Heating solutions focus 2/2

**Heat networks:**

- 4G with HIU
- 5G with apartment heat pumps

# Facilitating resolution of FHS issues - Hub process



## Appendix A - FHS ISSUES LOG

WORKING DOCUMENT

In Blue - Items added/updated since last issue

Updated: 01-Jun

1 = most important / urgent

| Change since last issue | Issue Title, Description & Comments | Subject | Grouping | | Importance | Urgency | Rating (IxU) | Status | Current Action by | Team to action | Suggested Actions | Relevant Doc | Section |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | **Guidance for consistency of interpretation of PV 'Max-fit' requirements**<br>Related items: #10, #11, #12, #13, #15, #16<br>*"5.73(b) An annual output (in kWh) for the building as calculated using the approved methodology at least equal to that of a photovoltaic array covering the reasonably practicable roof area with a panel efficiency of 0.22 kWp/m2 "* | PV | PV2 - 'Max-fit' | 0.9 | 1 | 1 | 1 | | FHH | PV D&CPG | Future Homes Hub to set up 'PV design and compliance process' group | Part L | Para 5.73(b) & Appendix B |
| 2 | **Guidance on roof vent acceptable and unacceptable locations**<br>- length of ductwork may increase if relocate to make way for PV panels. What implications does this have for ventilation system design?<br>- potentially could be quite a few vents, especially if using purge vents for Part O compliance and/or internal downpipes<br>- what 'rules' should be applied around location of vents, especially in 'Max-fit' scenario? | PV | PV2 - 'Max-fit' | 1.0 | | 1 | 1 | 1 | FHH | PV D&CPG | Future Homes Hub to set up 'PV design and compliance process' group | Part L | |
| 1 | **Definition of 'electricity is available to residents' in the context of PV on flats**<br>What configuration of PV system on a block of flats would meet the requirements? What is the intended definition of 'used for the benefit of the residents' within Para 5.75?<br>*"5.75 The system for renewable electricity generation should be designed so that generated electricity is available to residents of the dwellings. In buildings containing dwellings, this could be to individual dwellings and communal spaces where the electricity can be used for the benefit of the residents of the dwellings"* | PV | PV5 - For apartments | 1.0 | | 1 | 1 | 1 | FHH | PV D&CPG | - FHH to develop/collate list of contender examples<br>- Homebuilders to provide supporting evidence<br>- Future Homes Hub to set up FHS Apartments' Group at which this can be discussed | Part L | Para 5.75 |
| 1 | **Definition of the "curtilage of the building" in the context of Requirement L3**<br>What is the definition of "curtilage of the building"? This is not a defined term in Part L.<br>Requirement L3: "...within the boundaries of the curtilage of the building". | PV | PV6 - General | 1.0 | 1 | 1 | 1 | 1 | MHCLG | MHCLG | Clarification sought from MHCLG | Part L | Requirement L3 & Para 5.70 & 5.71 |
| 1 | **Required PV calculation in the context of a detached garage roof**<br>- confirmation detached garage is excluded in area for 40% requirement (as current SAP10 conventions)?<br>- would detached garage be part of the area required to have PV as part of 'Max-fit'? | PV | PV6 - General | 1.0 | 1 | 1 | 1 | 1 | MHCLG | MHCLG | Clarification sought from MHCLG | Part L | |

**FHS mailbox to feed in queries /issues:** FHSqueries@futurehomes.org.uk

# Feeling the heat: part 2

## Max Becker
### Head of MEP
Wates

# Wates Residential
# FHS: The homebuilder's perspective

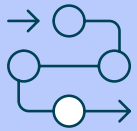
17 June 2026

Reimagining places for people to thrive

# FHS – Business as Usual

01

Design



02

Procurement

03

Installation

04

Handover

# Hard won Lessons – It wasn't always plain sailing

## Product Substitution

Team's buying on cost alone, swapping products without consideration and engineer input. The cheapest product may not be FHS compliant

## Installer Competency Gaps

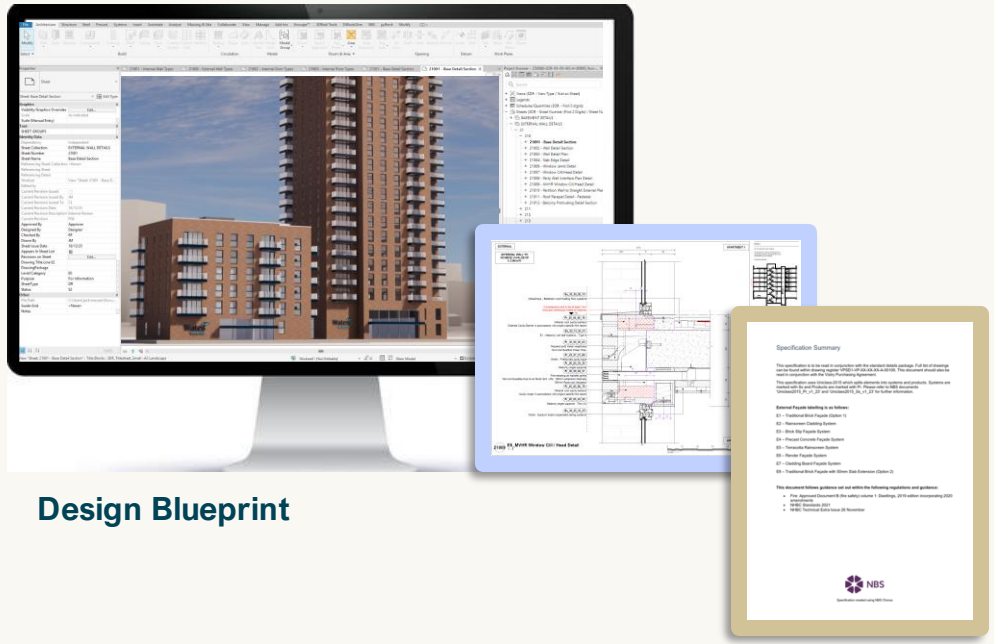
New products and technology can create gaps in installers competency introducing challenges on site at critical stages

## Poor Handover & Customer Education

System works & commissioned correctly. Customer turns it off because 'it feels different to a boiler.' Handover is not just paperwork; it's a personalised journey.

# A plan for excellence - Design


Standard House types



Design Blueprint

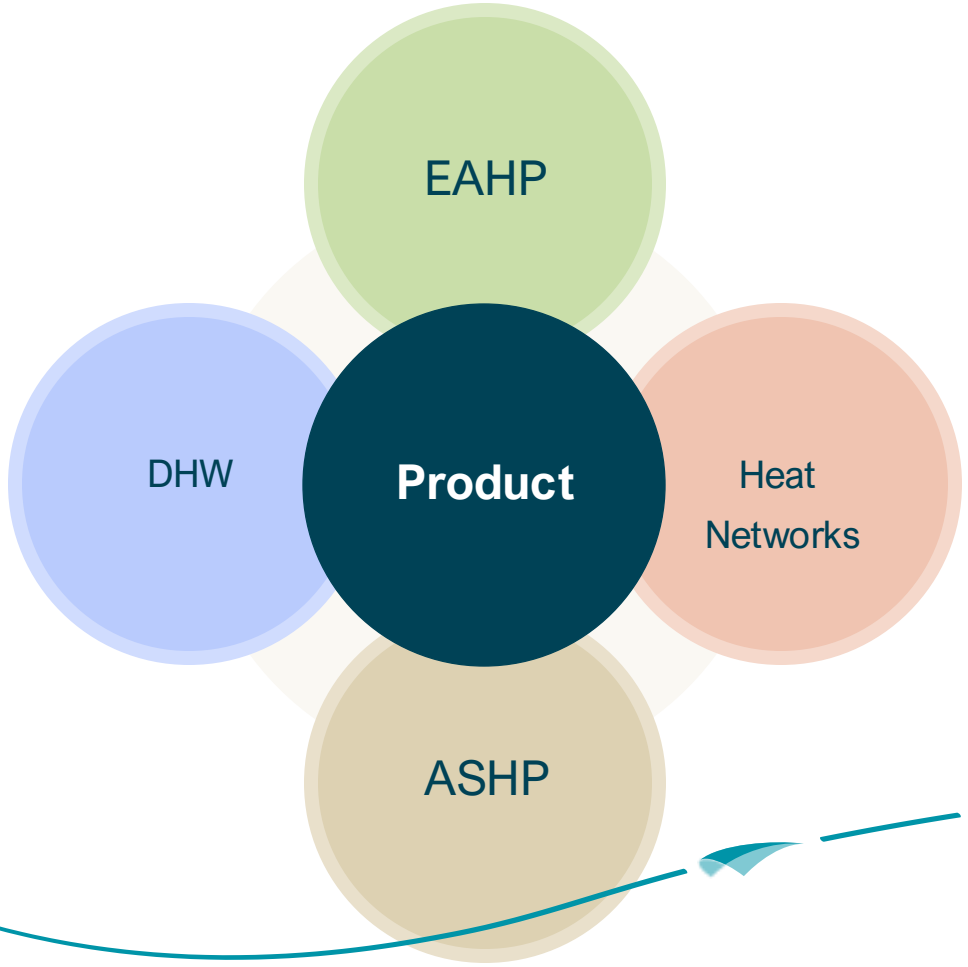
## We must

do what we say we will do

- Consistent approach with Standardised design
- Embedding compliance & quality
- Focus on the end user from day 1
- Capturing installation details early(equipment schedules, System requirements, controls strategy etc)

# Informed Procurement & Install

- When to select the right product – Inside & outside London, a need for more consistency
- Integrated Supply chain partnerships - installer competency is a procurement requirement, not a site managers problem
- Manufactures support & engagement early, don't wait until it's a it's a problem on site.




**Church End Project – EAHP**

# Commissioning & Handover Excellence

## Make or Break moment that defines customer experience…

### Pre-Commissioning Checks

- Introduction of an independent commissioning specialist
- Pre-checks done and recorded electronically

### System Commissioning

- Qualified engineers commissioning to spec, including manufactures input on site
- Systems set up correctly

### Snagging & Sign-off

- Commissioning reports witnessed and signed off by the MEP team, engineers, Independent parties and key stakeholders
- Including our aftercare team, witnessing each system in operation
- Home quality inspections

### Customer Handover

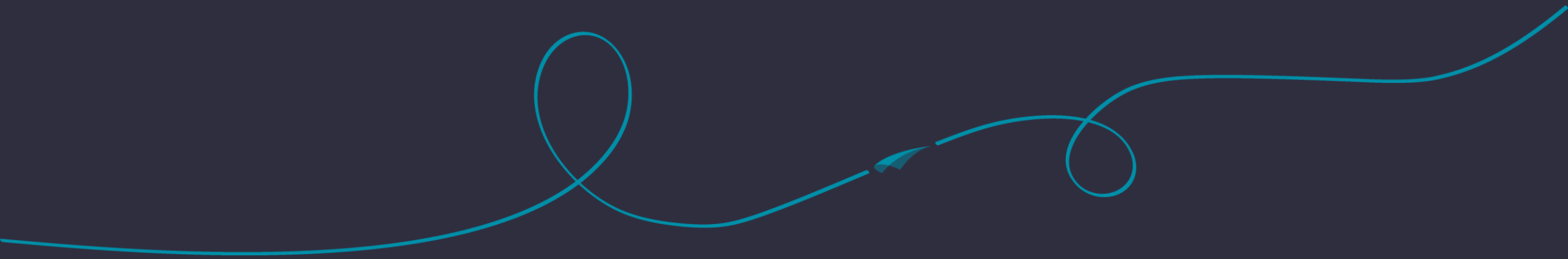
- Clear detailed handover packs
- Helpful and supportive demos and walkthroughs of each system and the controls
- How to heat your home guide
- Follow up check ins & calls

Invest in commissioning – It costs far less than post-occupation remedial work

Talk to your customers about how heat pumps work – the technology is not the barrier, the narrative is

Wates Residential

# Thank you



wates.co.uk

# Feeling the heat: part 2

## Nick Houghton-Best

**National Head of New Build**

Daikin

# DHW Heat Pumps Heat Networks

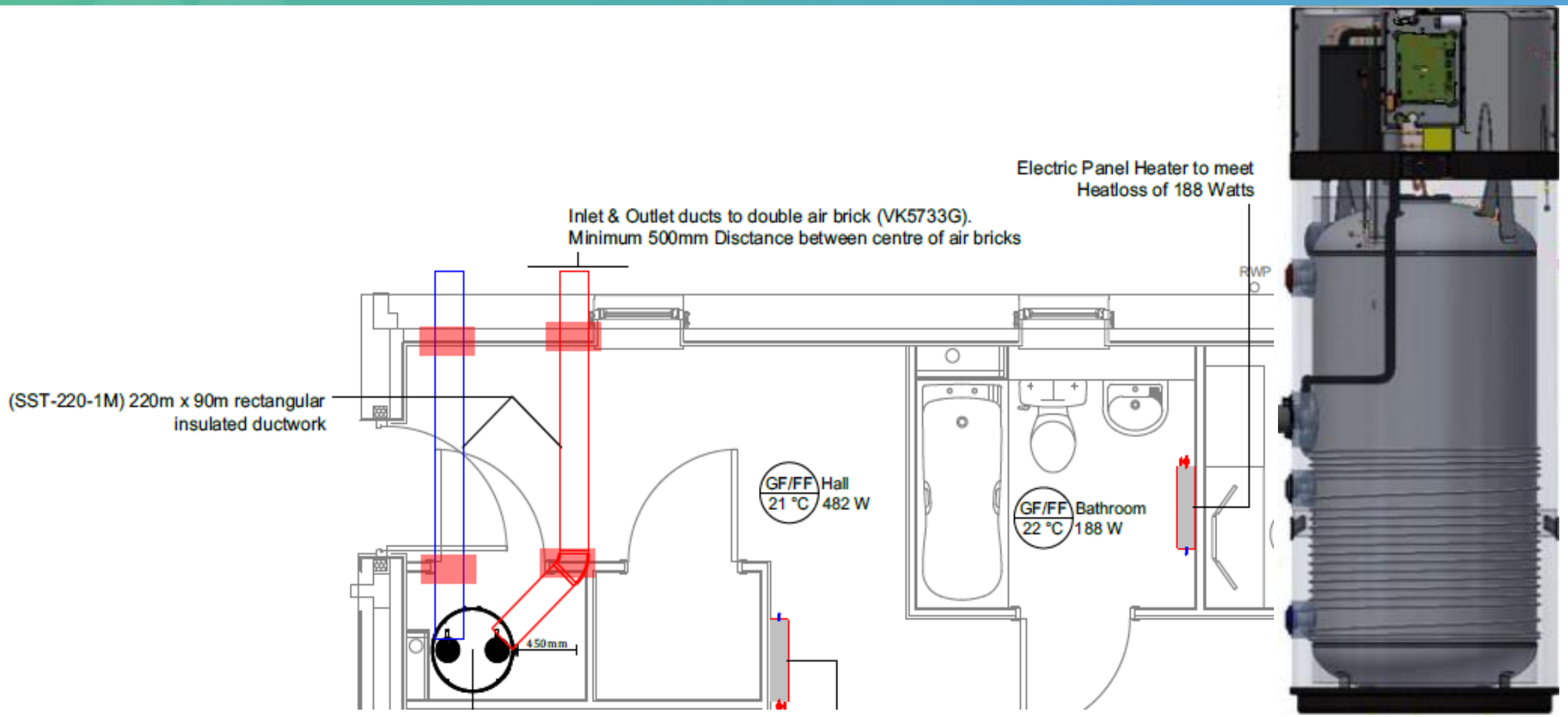
- Design DHWHP
- Training + SAP
- Heat Networks
- Summary

Nick Houghton-Best
UK Head Of New Build

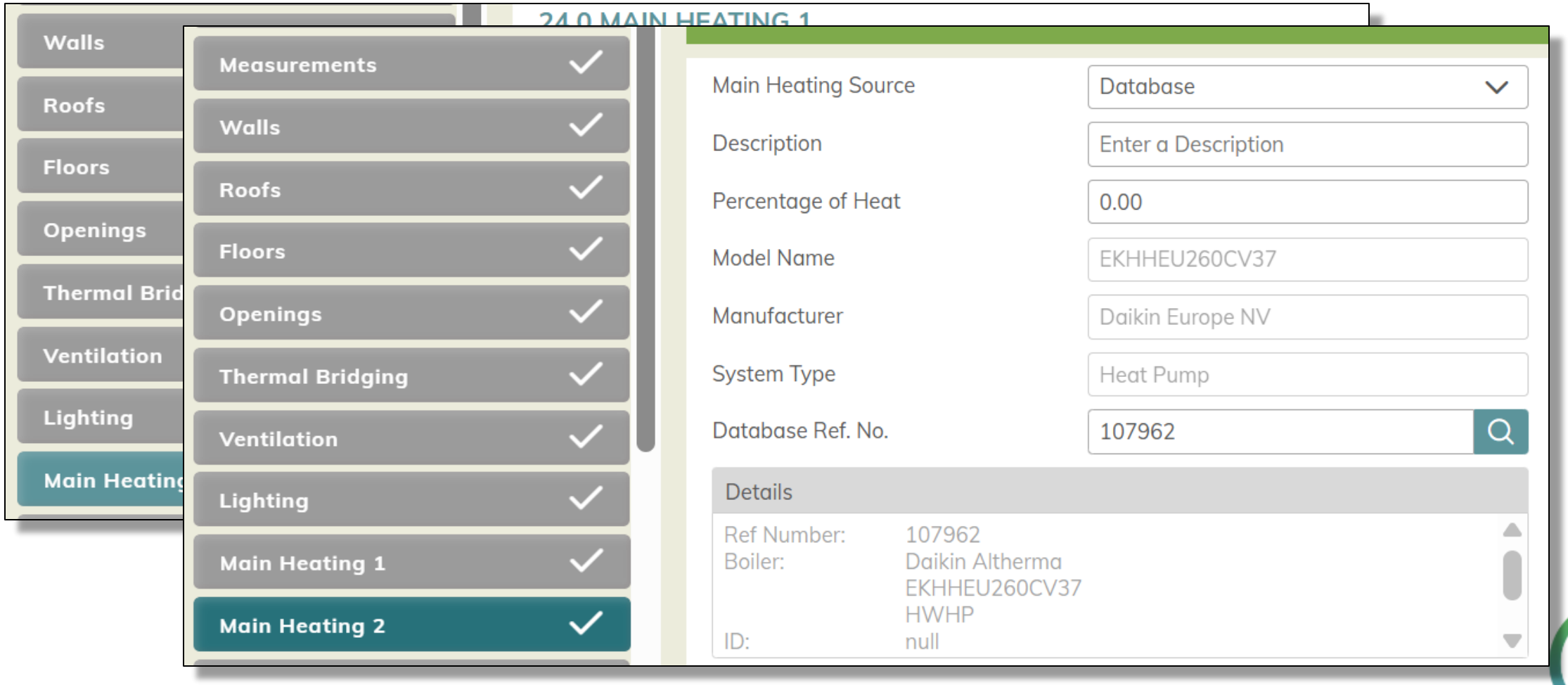
Future Homes Hub

DAIKIN

# DHWHP - Design



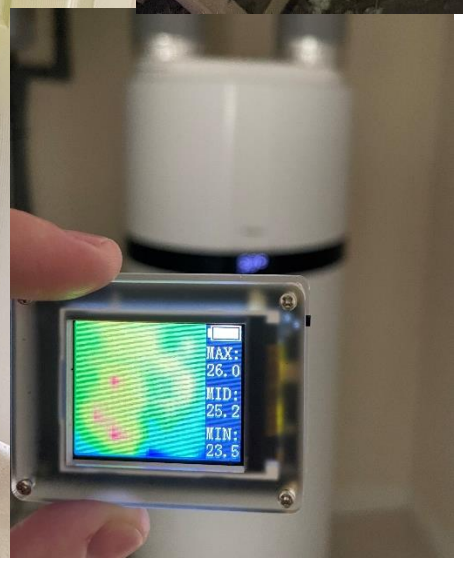
# DHWHP - SAP




Future Homes Hub

DAIKIN

# DHWHP - Installation


- Going well
- How can we improve
- Implement changes

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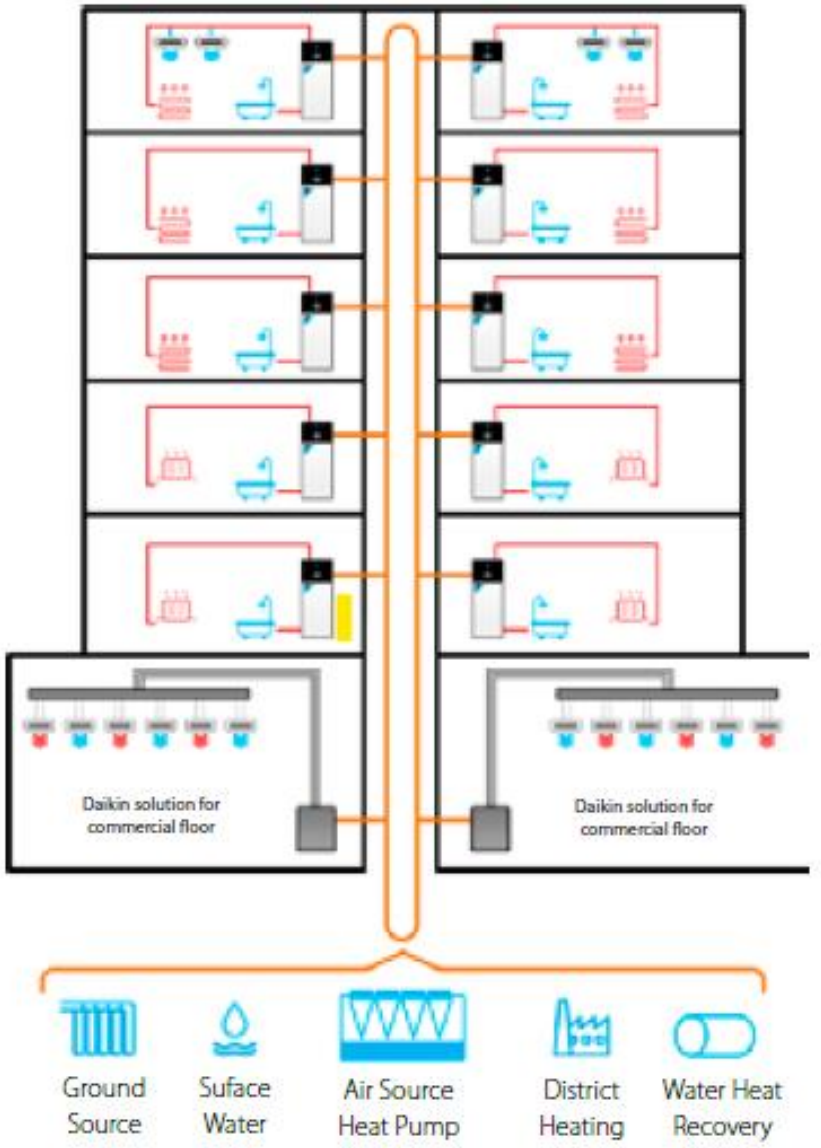
# Heat Networks WS & GSHP's

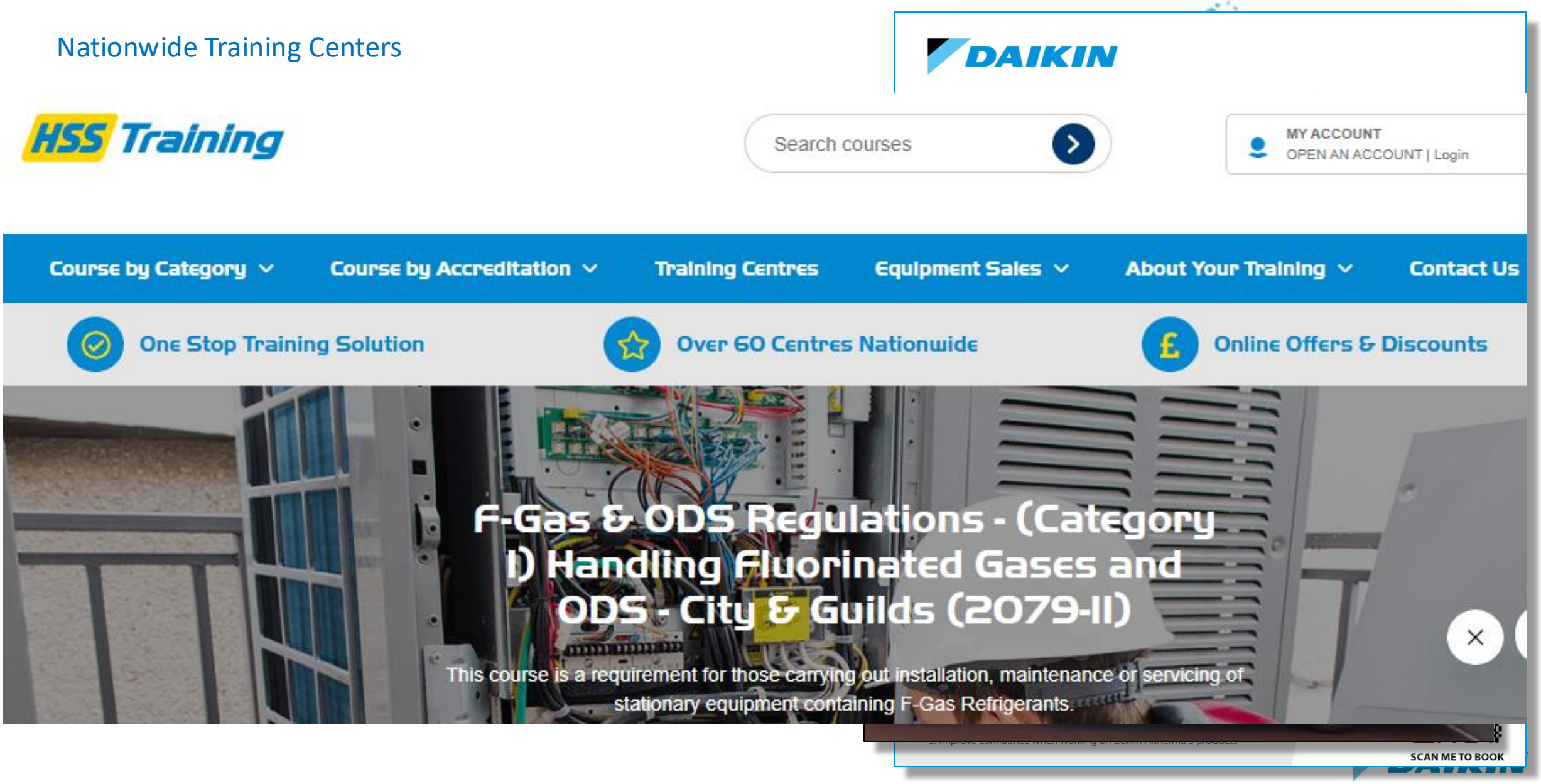

M&E Design
Multi Input

Future Homes Hub

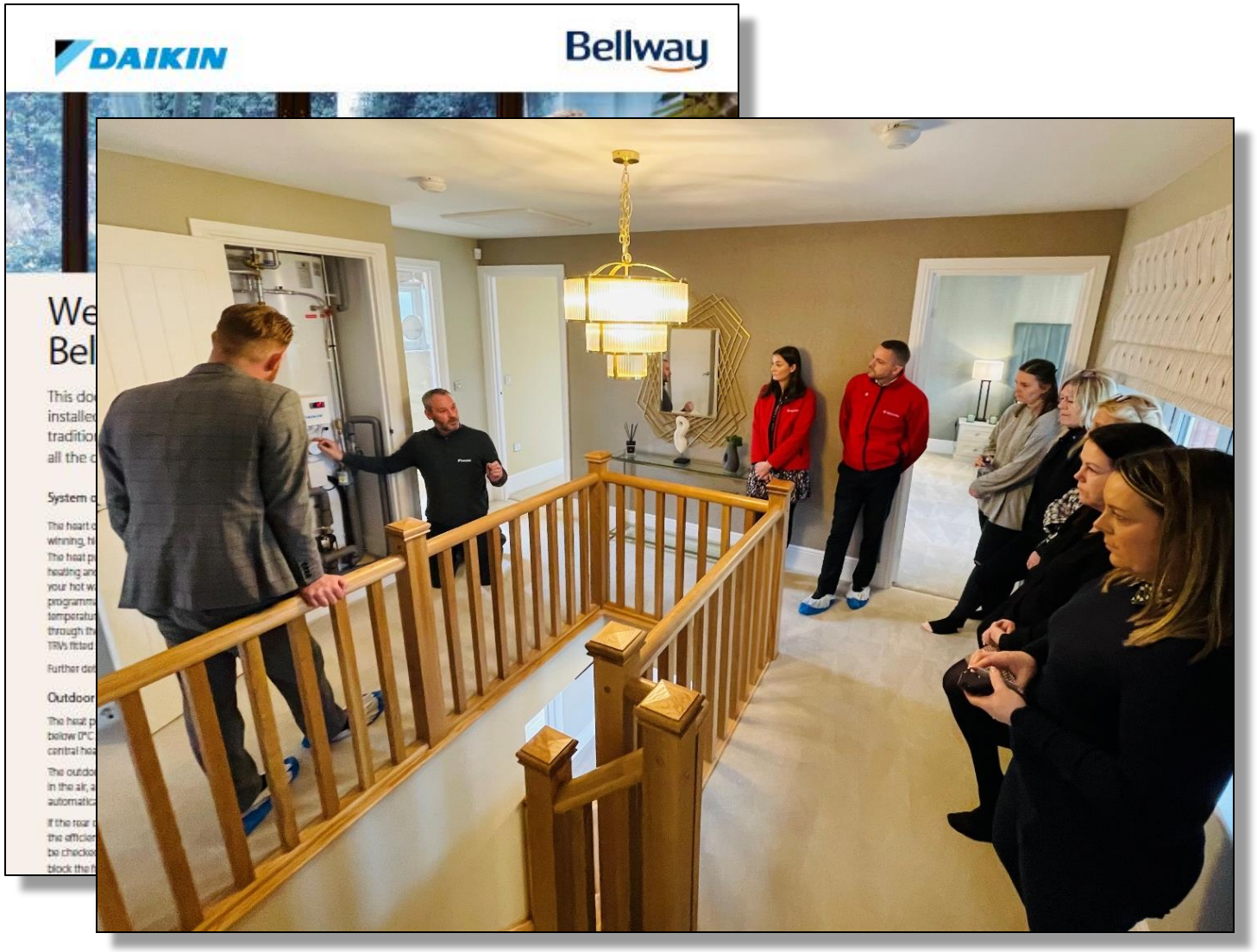
DAIKIN

# DHWHP & Heat Network - Training

Nationwide Training Centers



# Summary




- ✓ Solid Design
- ✓ Training
- ✓ Site Support
- ✓ Aftercare
- ✓ Design Consistency

Future Homes Hub

DAIKIN


# Feeling the heat: part 2

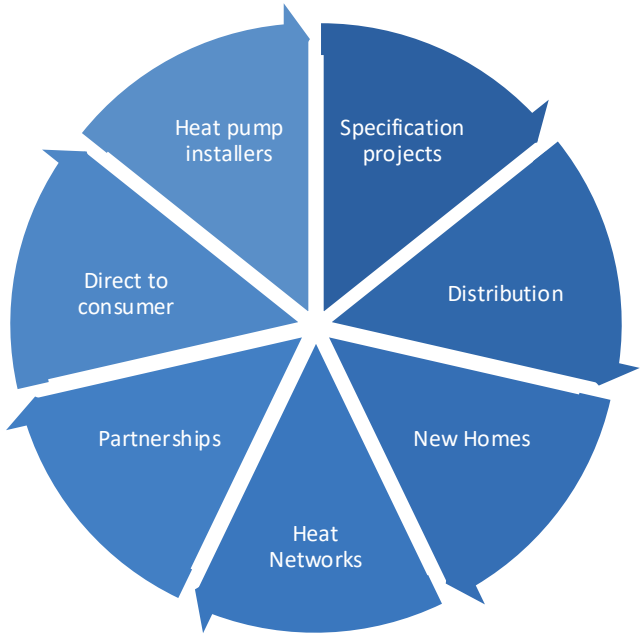
## Firat Ucer
### Regional Sales Manager
NIBE

NIBE

# HEJ

NIBE Energy Systems Ltd

# Our Route to Full Market Coverage




+

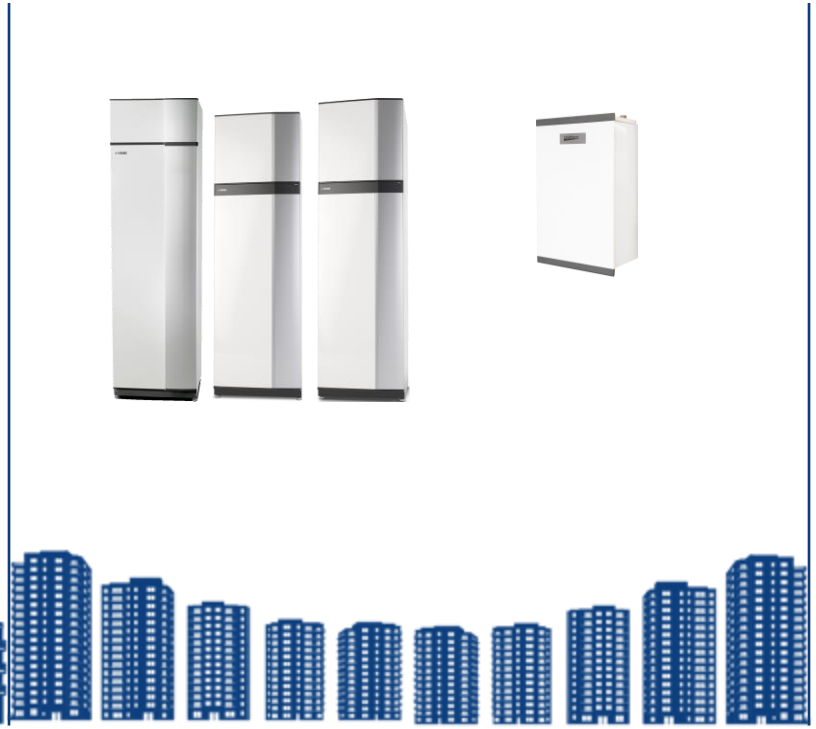
=

**Total domestic market coverage**

**NIBE addresses the UK domestic heating market through industry leading products and diverse routes to market.**

# Product Summary

NIBE



**Standard housing**
Air Source Heat Pump
Ground Source Heat Pump
Exhaust Air Heat Pump

**Low rise housing**
Exhaust Air System Heat Pump
HW Cylinder Heat Pump
Heat Interface Unit

**High rise**
Exhaust Air Heat Pump
Heat Interface Unit

NIBE

# NIBE S735C
# Exhaust Air Heat Pump

# S735-7 C

R290 Refrigerant: naturally occurring GWP = 3
70°C flow temperature

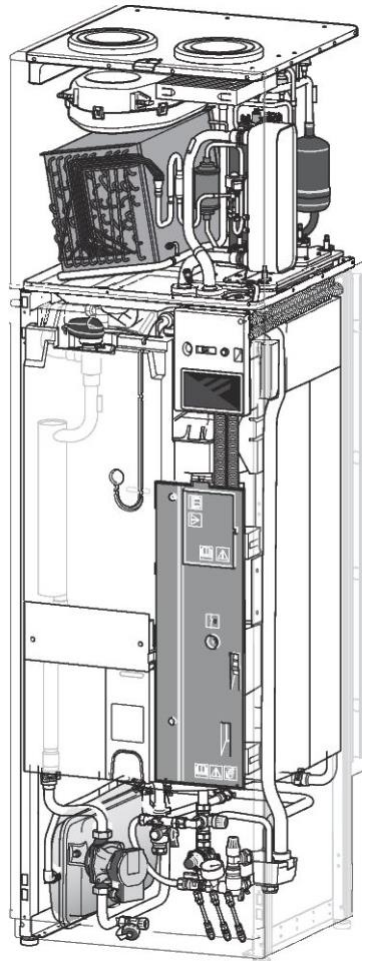
6kW Output (Heating + Cooling )
4kW Output (Heating + Cooling )

40dB(A) – 49dB(A) Sound Power Level
Minimum – Maximum Airflow with compressor

Smart Ventilation – $CO_2$ & Humidity optimisation
Versatility – cMEV and Balanced Supply vent solutions

# S735-7 C

- Active cooling can be provided to UFH or fan coils, via a two-pipe system
- Up to 3kw cooling output (dependent on air flow rates & OEK*)
- Cooling flow temp. of 18° C
- Cooling flow temp. down to 15° C with the use of a humidity sensing stat (THS 10 or ROT 10)
- Fan can be run at 100% whilst cooling- providing a double cooling effect!



# S735-7 C Operating Principle

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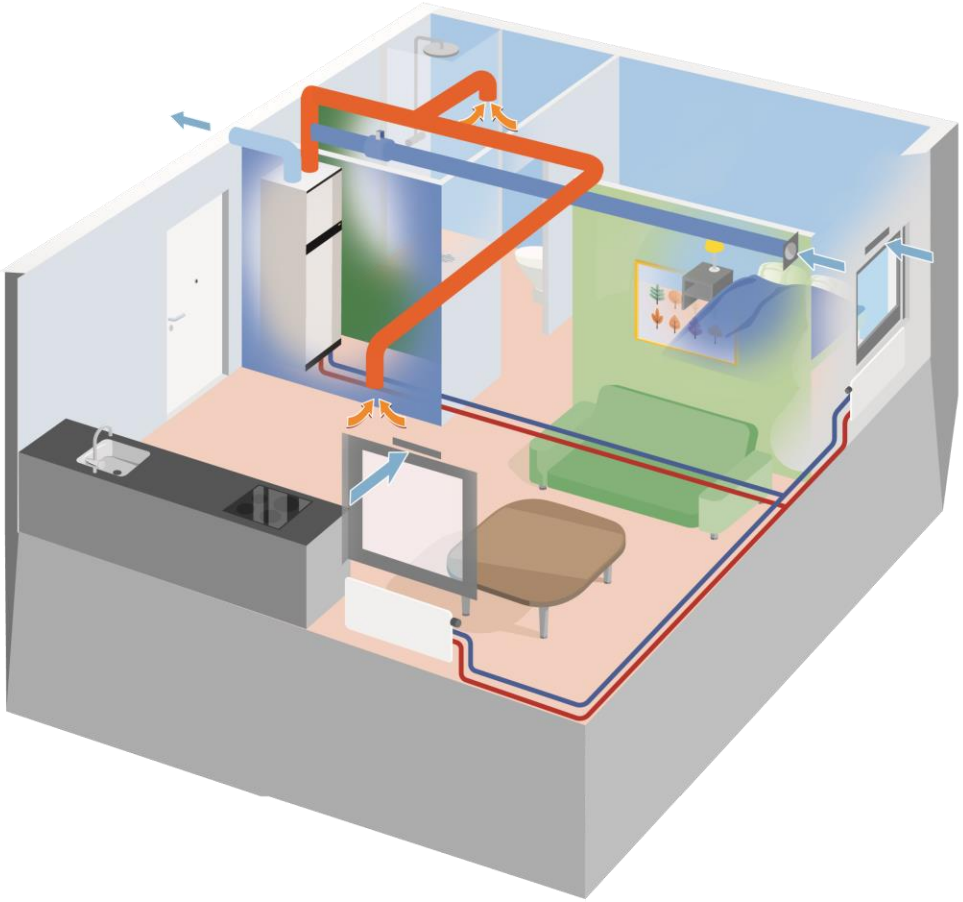
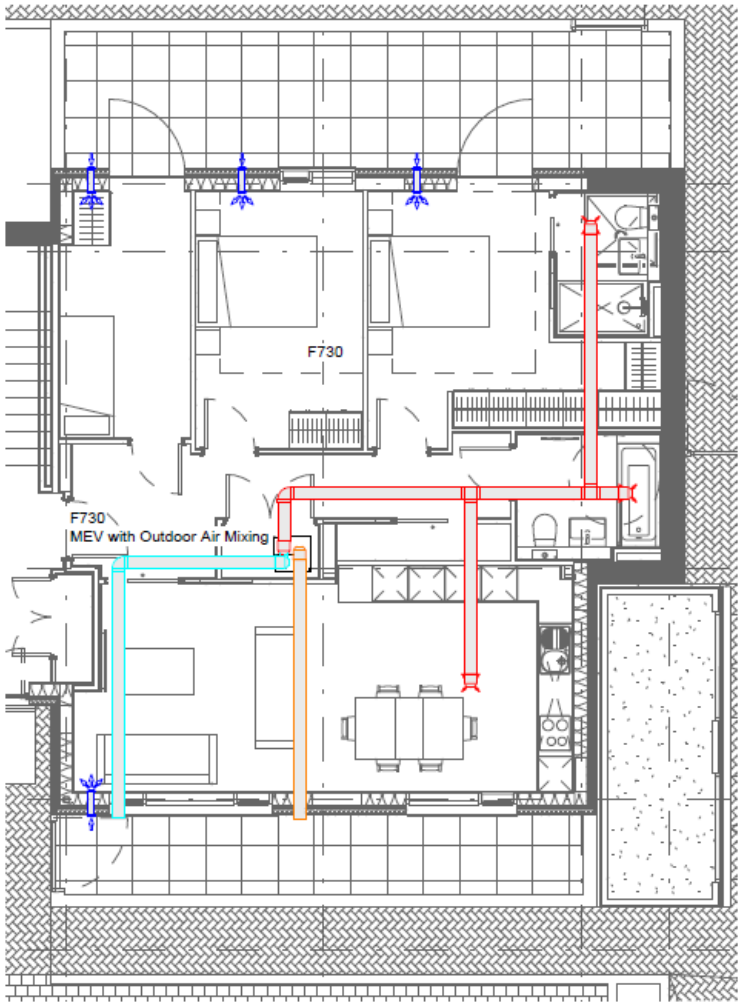
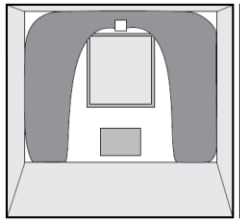
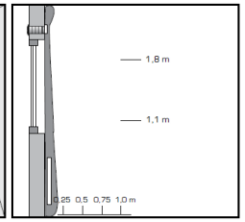






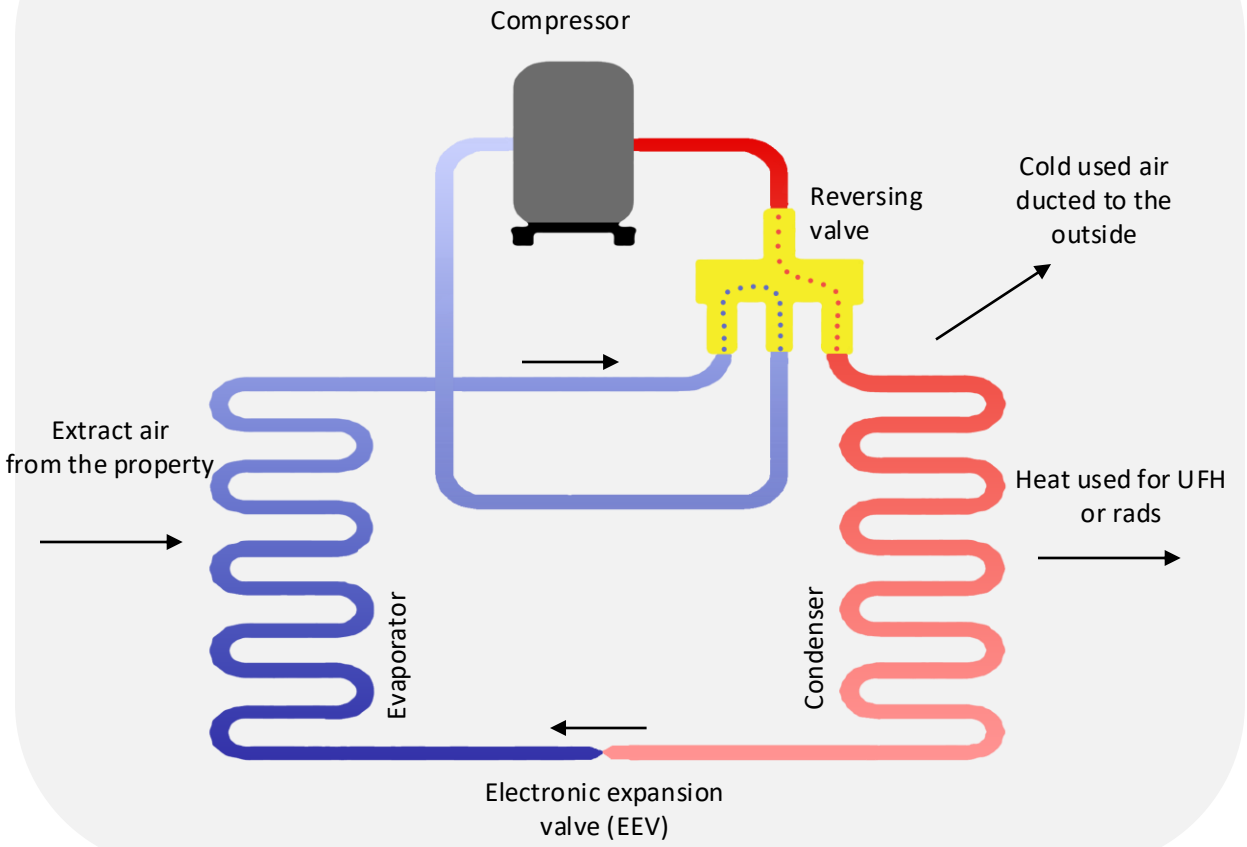

* Radiator heating, frontside
Airflow 8 l/s,
indoor temp +21°C
Power 500 W,
outdoor temp -20°C

Radiator heating, sideways
Airflow 8 l/s,
indoor temp +21°C
Power 500 W,
outdoor temp -20°C

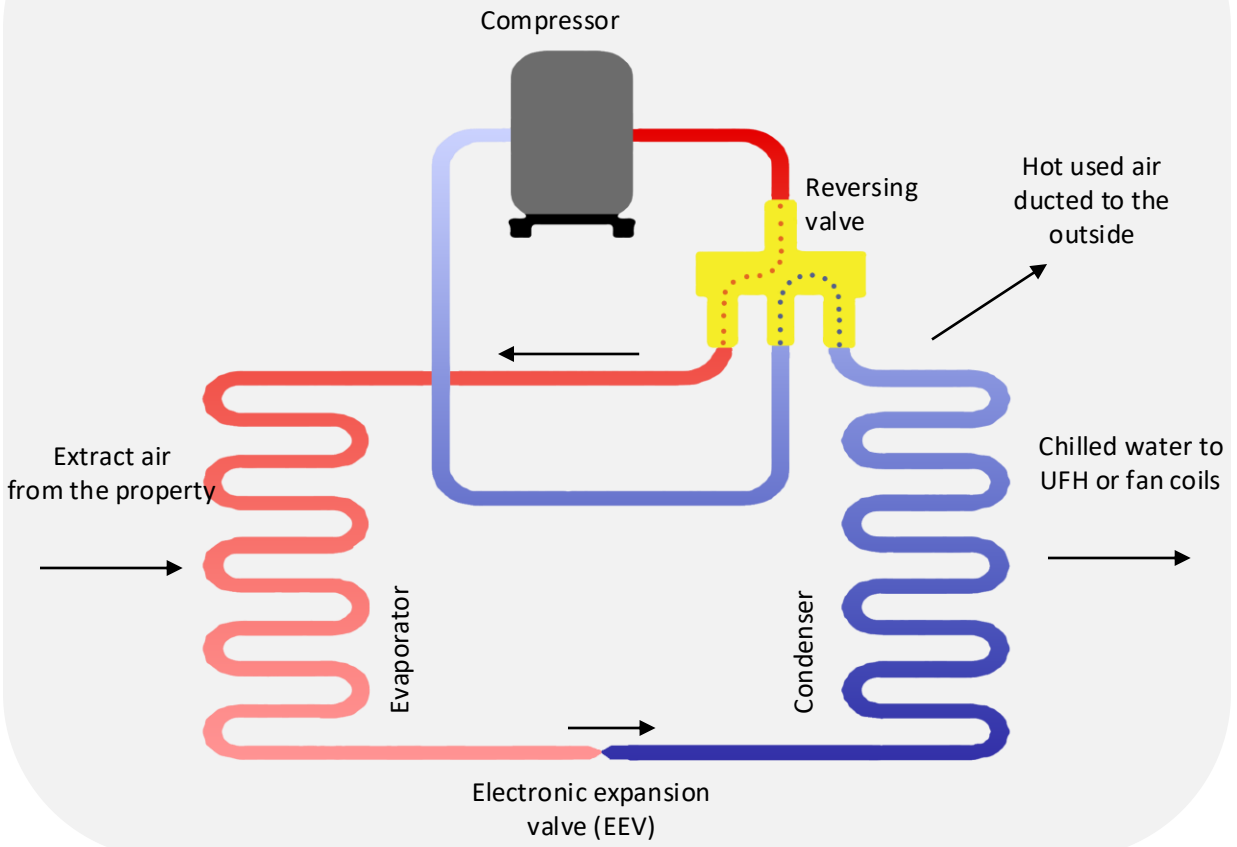
# S735-7 C

NIBE

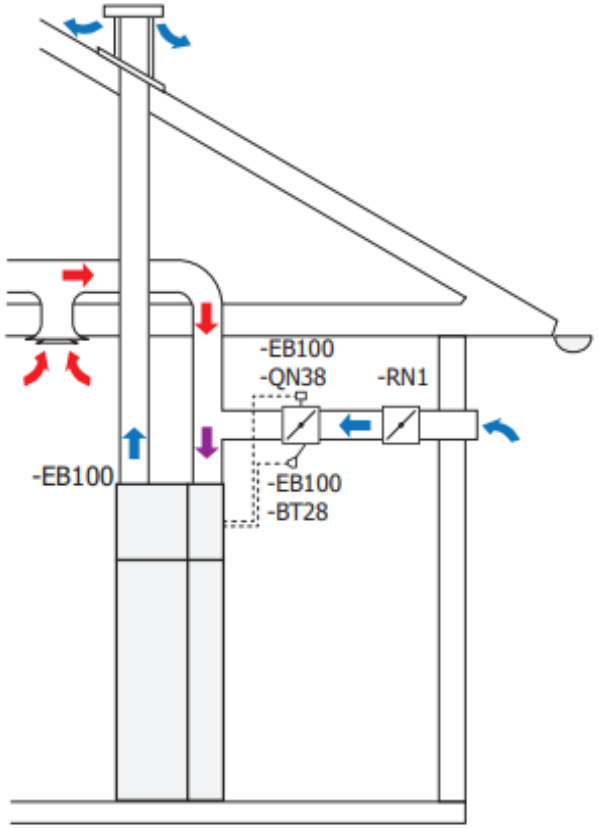
## Heating Mode

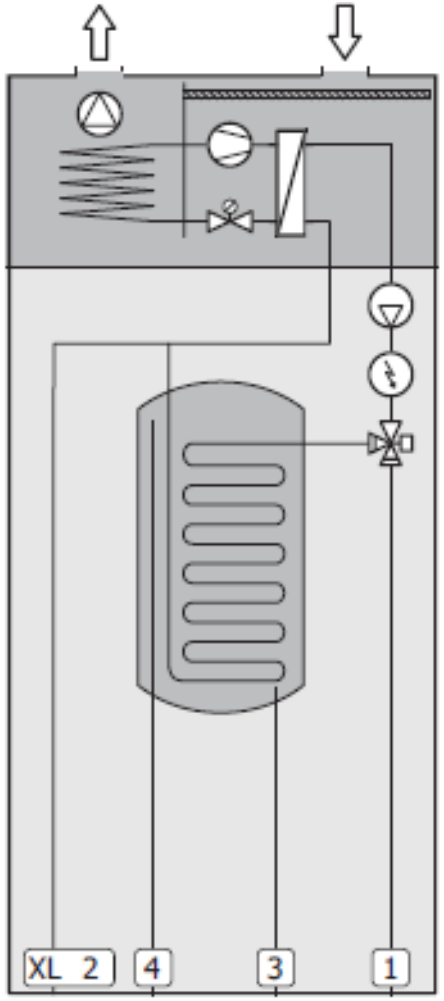



## Cooling Mode



# S735-7 C



# S735-7 C + SAM S42

## Mechanical Supply & Extract Ventilation Cooling

- Mechanical Supply & Extract Ventilation with SAM S42 removes any requirement for passive wall ventilators
- SAM S42 integrated heat exchange battery tempers incoming supply air, ensuring it is cooler than outside
- Tempered supply air in combination with the active cooling function provides a faster, more efficient cooling effect, ideal for larger properties

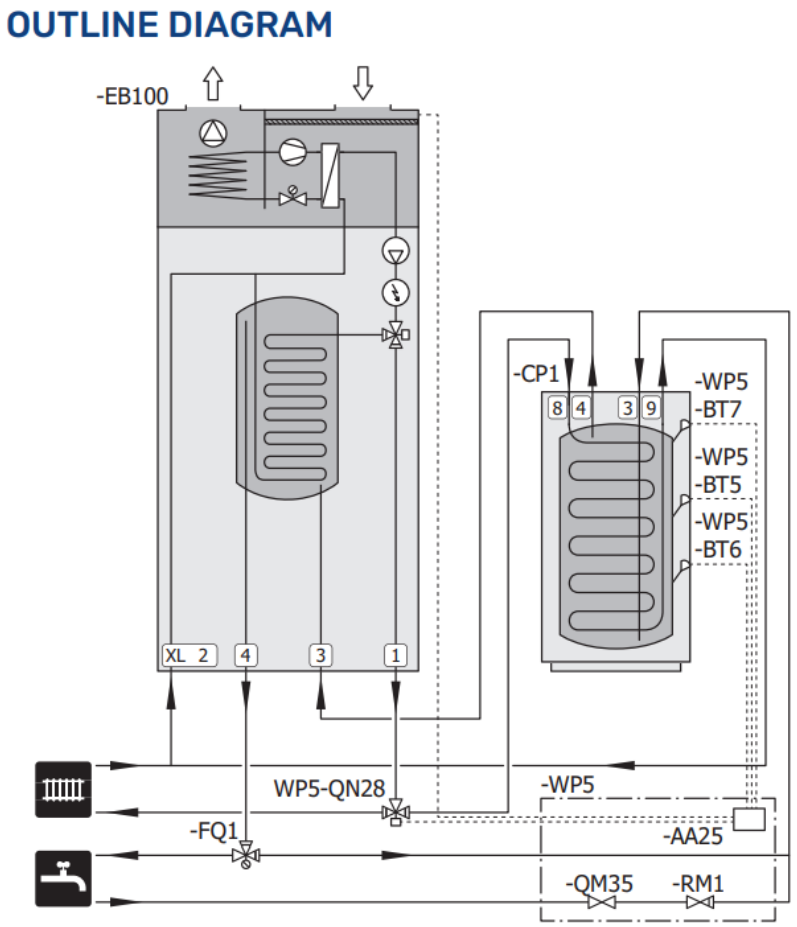
# S735-7 C Additional Accessories

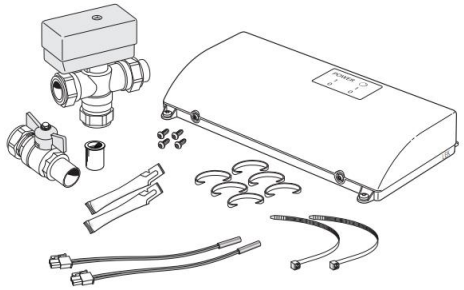
- **DEW S42**

  Docking arrangement for additional VPB S200 & DWS S42 hot water cylinders with S735 C.

  Hot water draw comes from internal S735 C cylinder, which is replenished with the water contents in the relevant cylinder accessory.

  The internal 180 litre cylinder is re-charged as a priority.  Hot Water and Heating priority can be adjusted as required.



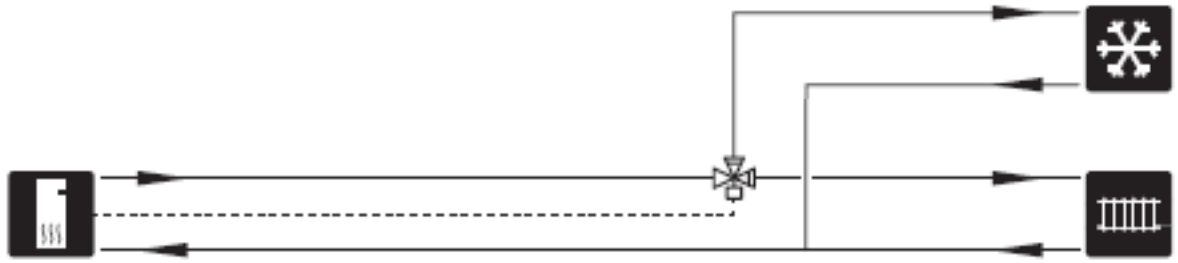



# S735-7 C Additional Accessories

- **VCC S12 (267009)**

  **New** Three-way valve

To be used when systems use different types of emitters, eg; Radiators upstairs & Underfloor downstairs



NIBE

# Feeling the heat: part 2

**Dan Neasham**
**Head of Sustainability and Performance**
Future Homes Hub

**Max Becker**
**Head of MEP**
Wates

**Nick Houghton-Best**
**National Head of New Build**
Daikin

**Adam Tckaz**
**Business Development Director - Sustainable Heat**
GTC

**Firat Ucer**
**Regional Sales Manager**
NIBE

# Powering up

**David Adams**
**Strategic Advisor**
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**Nicola Kennedy**
**Head of Microgrids**
E.ON Next

**Swetta Coopmah**
**Head of Smart Energy Systems**
BEAMA

**Neil Madgwick**
**Head of Connections Service Delivery**
UK Power Networks

**Dan Nicholls**
**Chief Product Officer**
SNRG

# Powering up


## David Adams

### Strategic Advisor

Future Homes Hub

# The Future Homes Standard Essentials

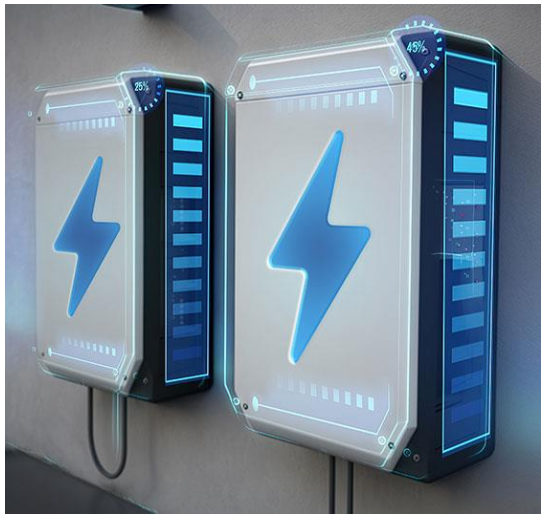
## Seven actions to de-risk delivery today


1. Lead early, learn fast, share lessons
2. Prioritise grid availability
3. Own the customer journey
4. Evolve your design
5. Get heating design right
6. Build as designed
7. Commission with care

**www.futurehomes.org.uk/future-homes-standard-ready**

**Google: get future homes standard ready**

# New homes bring new electrical demands

# Developer risks

**Viability:**

Where possible **sites should be assessed**, and **network operator queried** before site acquisition

**Programme:**

**Allow time** for assessment, **operator engagement**, design and **possible reinforcement**

**Design:**

**Competent load assessment** and design, done early, is **essential to ensure right sized connections**

**Commercial:**

Consider larger / more substations, **larger POCs, down stream network enhancement** and mitigation

**Customer:**

Customers will **expect to see benefits** so curtailing export (and import) **should be minimised**

# A change in approach is needed

**Estimate capacity and engage with the network operator early**

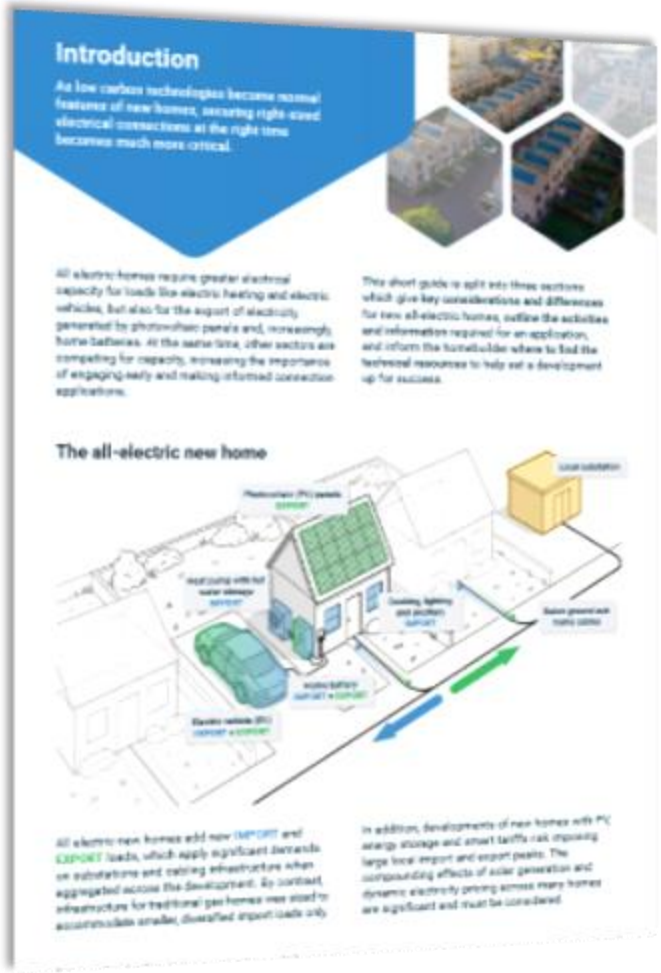
**Choose your delivery model up-front and build your team**

**Avoid over or under-assessing the electrical demand**

**Develop the electrical design with network operator input**

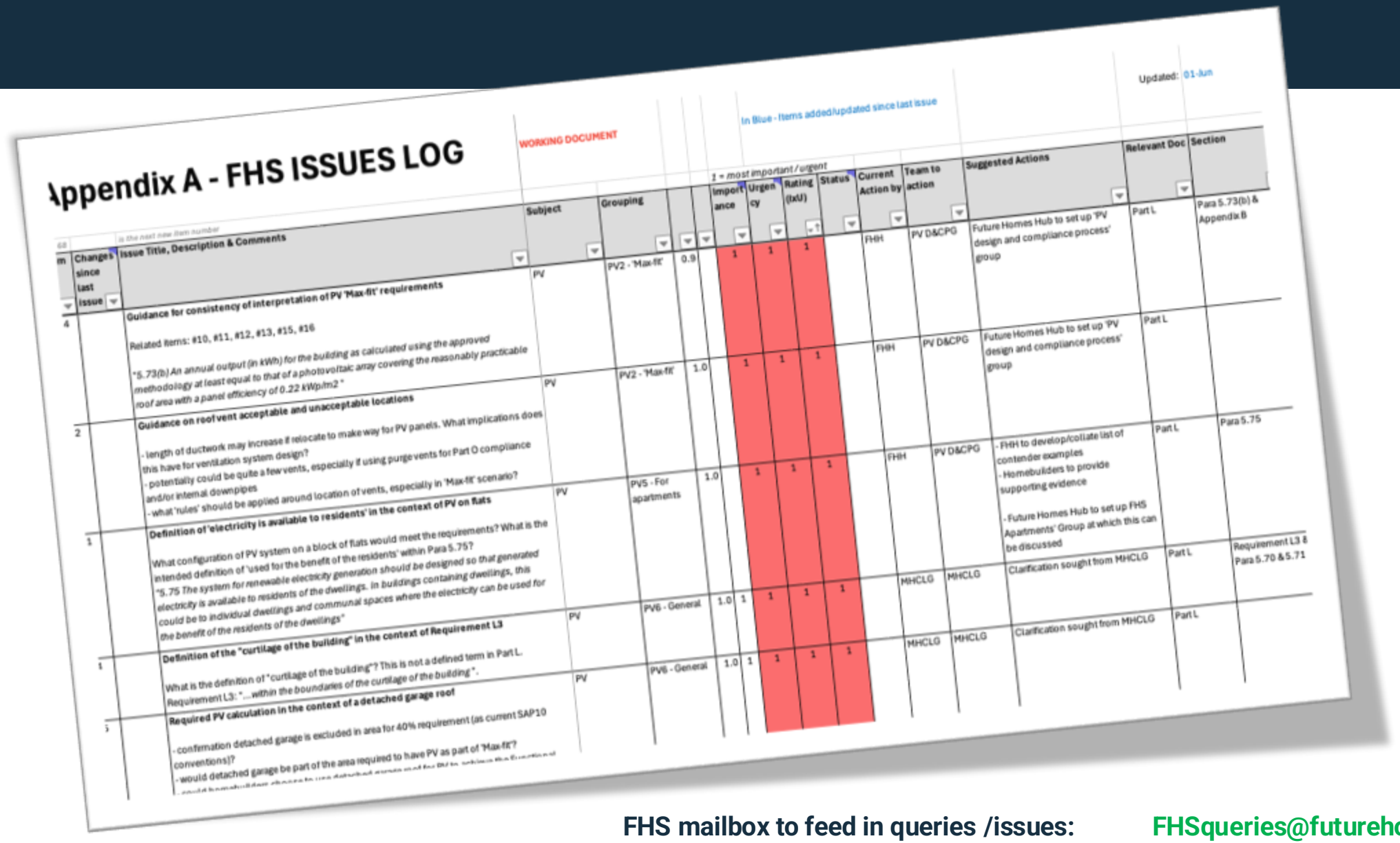
**Remember: Mitigations to connection constraints exist**

# Help is available




- Network operators are very happy to discuss propositions at no cost
- Make sure a competent client agent is engaged early in the process
- Hub guidance is available, with more on the way: https://knowledge.futurehomes.org.uk/resource/grid-connections/

# Facilitating resolution of FHS issues - Hub process



## Appendix A - FHS ISSUES LOG

WORKING DOCUMENT

In Blue - Items added/updated since last issue

Updated: 01-Jun

1 = most important / urgent

| Change since last issue | Issue Title, Description & Comments | Subject | Grouping | | Importance | Urgency | Rating (IxU) | Status | Current Action by | Team to action | Suggested Actions | Relevant Doc | Section |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | **Guidance for consistency of interpretation of PV 'Max-fit' requirements**<br>Related items: #10, #11, #12, #13, #15, #16<br>*"5.73(b) An annual output (in kWh) for the building as calculated using the approved methodology at least equal to that of a photovoltaic array covering the reasonably practicable roof area with a panel efficiency of 0.22 kWp/m2 "* | PV | PV2 - 'Max-fit' | 0.9 | 1 | 1 | 1 | | FHH | PV D&CPG | Future Homes Hub to set up 'PV design and compliance process' group | Part L | Para 5.73(b) & Appendix B |
| 2 | **Guidance on roof vent acceptable and unacceptable locations**<br>- length of ductwork may increase if relocate to make way for PV panels. What implications does this have for ventilation system design?<br>- potentially could be quite a few vents, especially if using purge vents for Part O compliance and/or internal downpipes<br>- what 'rules' should be applied around location of vents, especially in 'Max-fit' scenario? | PV | PV2 - 'Max-fit' | 1.0 | | 1 | 1 | 1 | FHH | PV D&CPG | Future Homes Hub to set up 'PV design and compliance process' group | Part L | |
| 1 | **Definition of 'electricity is available to residents' in the context of PV on flats**<br>What configuration of PV system on a block of flats would meet the requirements? What is the intended definition of 'used for the benefit of the residents' within Para 5.75?<br>*"5.75 The system for renewable electricity generation should be designed so that generated electricity is available to residents of the dwellings. In buildings containing dwellings, this could be to individual dwellings and communal spaces where the electricity can be used for the benefit of the residents of the dwellings"* | PV | PV5 - For apartments | 1.0 | | 1 | 1 | 1 | FHH | PV D&CPG | - FHH to develop/collate list of contender examples<br>- Homebuilders to provide supporting evidence<br>- Future Homes Hub to set up FHS Apartments' Group at which this can be discussed | Part L | Para 5.75 |
| 1 | **Definition of the "curtilage of the building" in the context of Requirement L3**<br>What is the definition of "curtilage of the building"? This is not a defined term in Part L.<br>Requirement L3: "...within the boundaries of the curtilage of the building". | PV | PV6 - General | 1.0 | 1 | 1 | 1 | 1 | MHCLG | MHCLG | Clarification sought from MHCLG | Part L | Requirement L3 & Para 5.70 & 5.71 |
| 1 | **Required PV calculation in the context of a detached garage roof**<br>- confirmation detached garage is excluded in area for 40% requirement (as current SAP10 conventions)?<br>- would detached garage be part of the area required to have PV as part of 'Max-fit'? | PV | PV6 - General | 1.0 | 1 | 1 | 1 | 1 | MHCLG | MHCLG | Clarification sought from MHCLG | Part L | |

**FHS mailbox to feed in queries /issues:** FHSqueries@futurehomes.org.uk

# Powering up

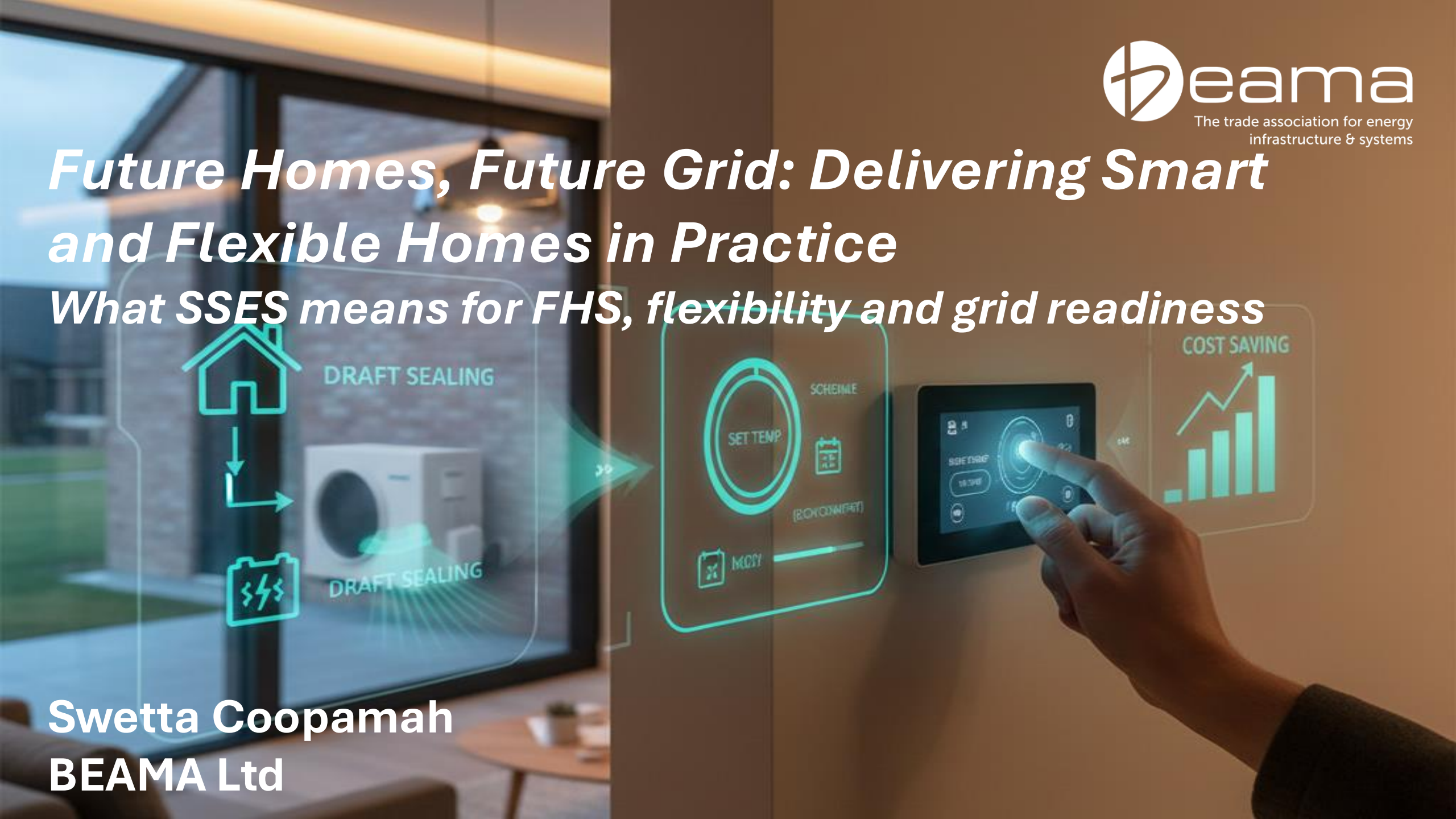
## Nicola Kennedy
### Head of Microgrids
E.ON Next

# Powering up

## Swetta Coopmah

### Head of Smart Energy Systems

BEAMA




# *Future Homes, Future Grid: Delivering Smart and Flexible Homes in Practice*

## *What SSES means for FHS, flexibility and grid readiness*

**Swetta Coopamah**
**BEAMA Ltd**

The trade association for energy infrastructure & systems

# Agenda

1. What is SSES?
2. Why is SSES happening?
3. Products in scope/ not in scope
4. How will SSES work in practice?
5. What are the timelines
6. Why this matters for FHS and new build
7. What are the benefits
8. Challenges
9. What success looks like

# What is SSES (Smart Secure Electricity Systems)

SSES is the Government's programme focused on how connected energy technologies operate securely, flexibly and interoperably within the wider electricity system.

**SSES focuses on how connected technologies:**

- Operate securely
- Respond flexibly to grid needs
- Communicate and work together effectively

**Covers technologies such as:**

- Heat pumps and other heating devices
- EV charge points
- Battery storage

**Key themes:**

- Flexibility
- Interoperability
- Cyber security
- Smart functionality

# Why is SSES happening?

## The electricity system is changing rapidly

**Homes are becoming increasingly electrified through:**

- Heat pumps
- EV charging
- Battery storage
- Smart technologies

**This creates new challenges for the electricity system:**

- Higher electricity demand
- Greater peak pressure on local networks
- More variable renewable generation
- Need for smarter demand management

**SSES is intended to help enable:**

- Consumer-led flexibility
- Smarter use of electricity demand
- Better coordination between homes and the grid

# What products are in scope?

## In scope:

1. Smart EV charge points
2. Domestic/small-scale battery storage systems
3. Heat
    - Heat pumps (air-source, ground-source,
    - water-source excluding air-to-air)
    - Hybrid heat pumps (but not the fuel boiler itself)
    - Storage heaters (non-hydronic, distributed)
    - Heat batteries (direct-charging types only)
    - Standalone direct electric hot water cylinders
    - Hot water heat pumps

## Not in scope:

1. Electric vehicles themselves Grid-scale battery storage
2. Large public charging infrastructure
3. Non-smart/dumb devices
4. Air-to-air heat pumps
5. Indirect cylinders (heated via a heat pump or boiler)
6. Indirect heat batteries
7. Any heating appliance over 45 kW

# How will SSES work in practice?

The future home becomes part of a connected energy system

| Homes increasingly contain: | These technologies can: |
| --- | --- |
| • Heat pumps<br>• EV charging<br>• Battery storage<br>• Smart controls and HEMS<br>• Solar and connected technologies | • Respond to electricity price signals<br>• Shift demand away from peak periods<br>• Optimise energy use automatically<br>• Help balance pressure on the grid |

**The aim of SSES is to support:**

- Consumer-led flexibility
- Smarter use of electricity demand
- Better interoperability between technologies
- More secure and connected energy systems

# Where are we now?

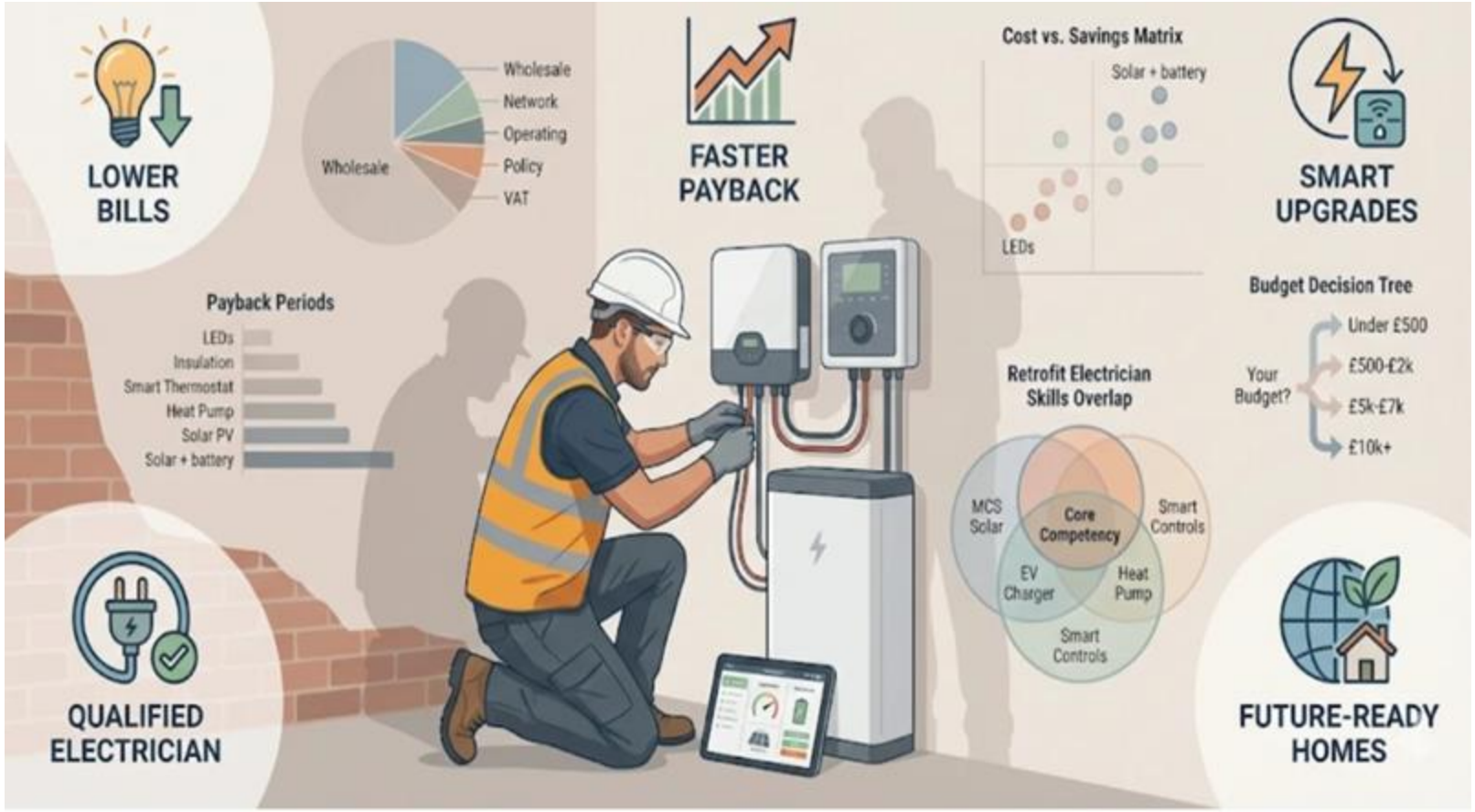
DESNZ is currently progressing the **first phase of the SSES Energy Smart Appliance regulations** following the consultation published in late 2025.
The direction of travel is now moving from policy development towards implementation and delivery.

**The expectation is:**
regulations laid in Parliament in **Q1/Q2 2026** implementation period running through to **31 December 2027** for the wider ESA requirements.
Some EV-only amendments are expected to apply earlier around six months after regulations are made.

| Timeline | SSES activity |
|---|---|
| **Late 2025 / Early 2026** | Phase 1 consultation and policy development |
| **Q1/Q2 2026** | DESNZ expected to lay Phase 1 regulations |
| **Mid/Late 2026** | Some EV-specific provisions expected to begin |
| **Autumn 2026** | Governance and wider implementation work progressing |
| **End 2027** | Wider Phase 1 ESA compliance expected |
| **2027 onwards** | Phase 2 interoperability and wider market integration development expected |

# What are the opportunities for new build? Its huge

We are moving from “smart devices in homes” to “homes operating as integrated energy systems”



# Why this matters for FHS and new build

## New build homes are becoming part of the energy system

### FHS homes are increasingly expected to include:

- Electrified heating
- EV infrastructure
- Smart controls
- Flexible demand capability
- Higher digital connectivity

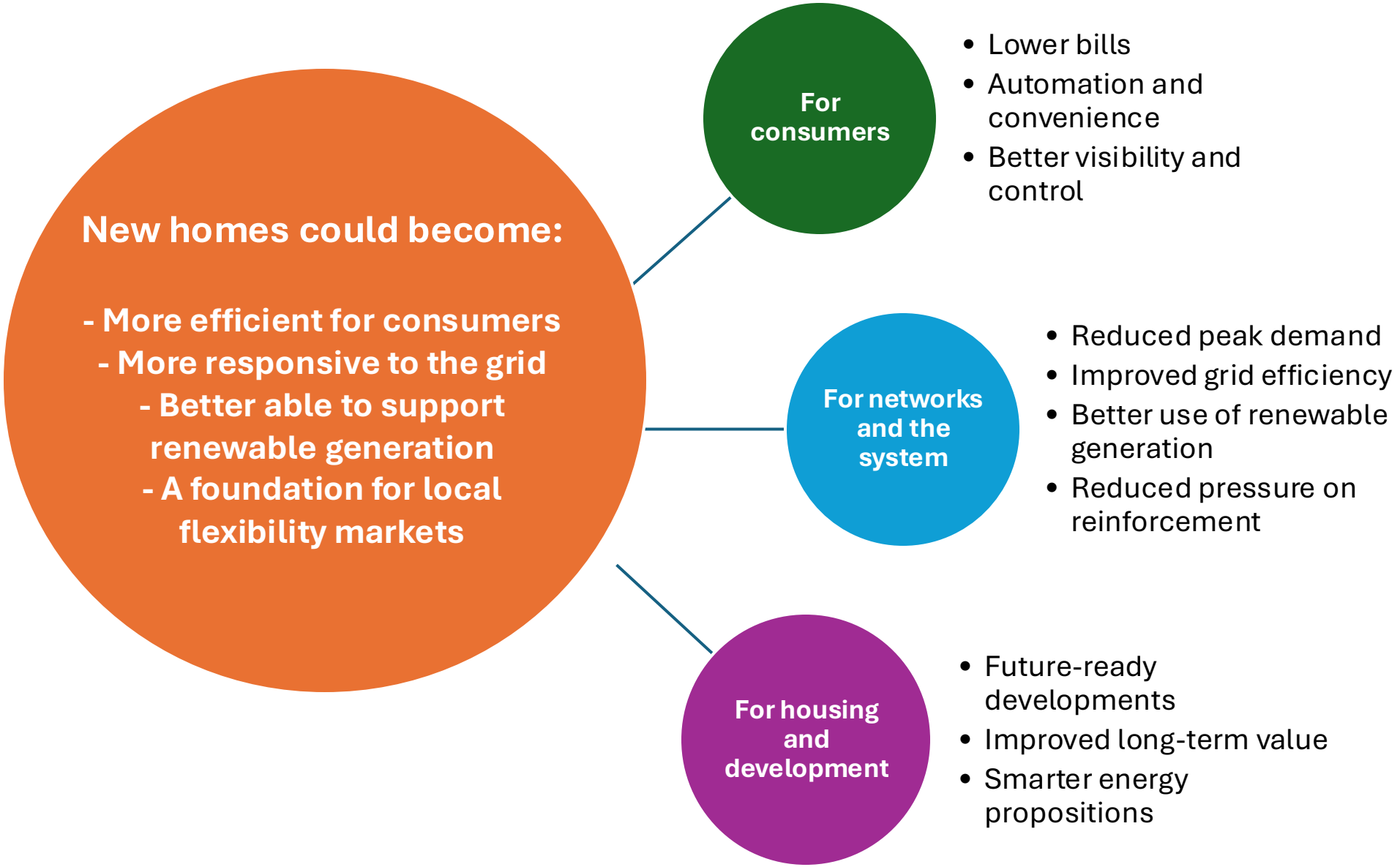
### Opportunity for developers:

- Lower running costs for consumers
- Better optimisation of energy use
- Improved grid utilisation
- Potential participation in flexibility services
- Smarter whole-home energy management

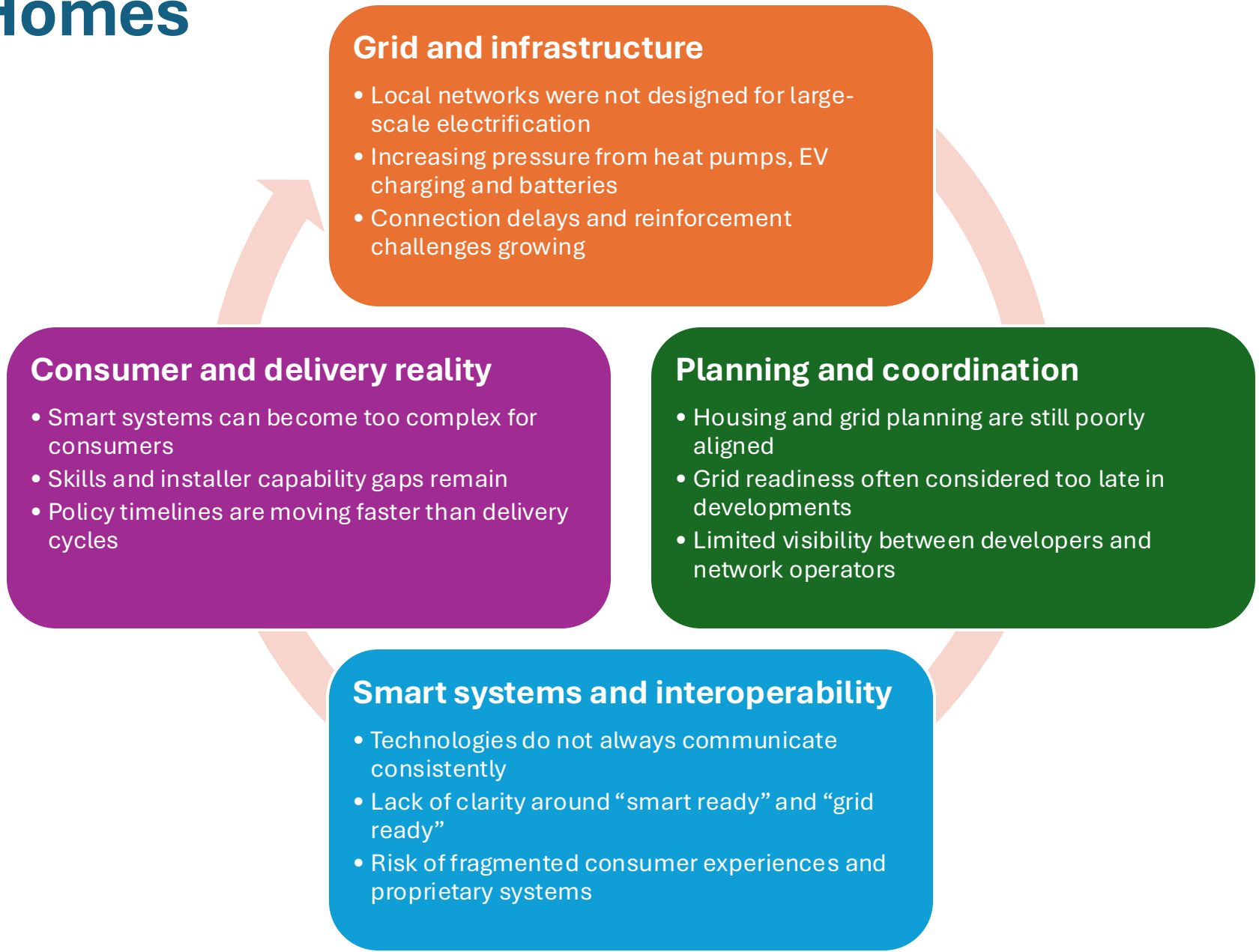
### Why are new builds important?

- Easier to design smart capability in from the start
- Avoids costly retrofit later
- Creates more future-ready housing stock

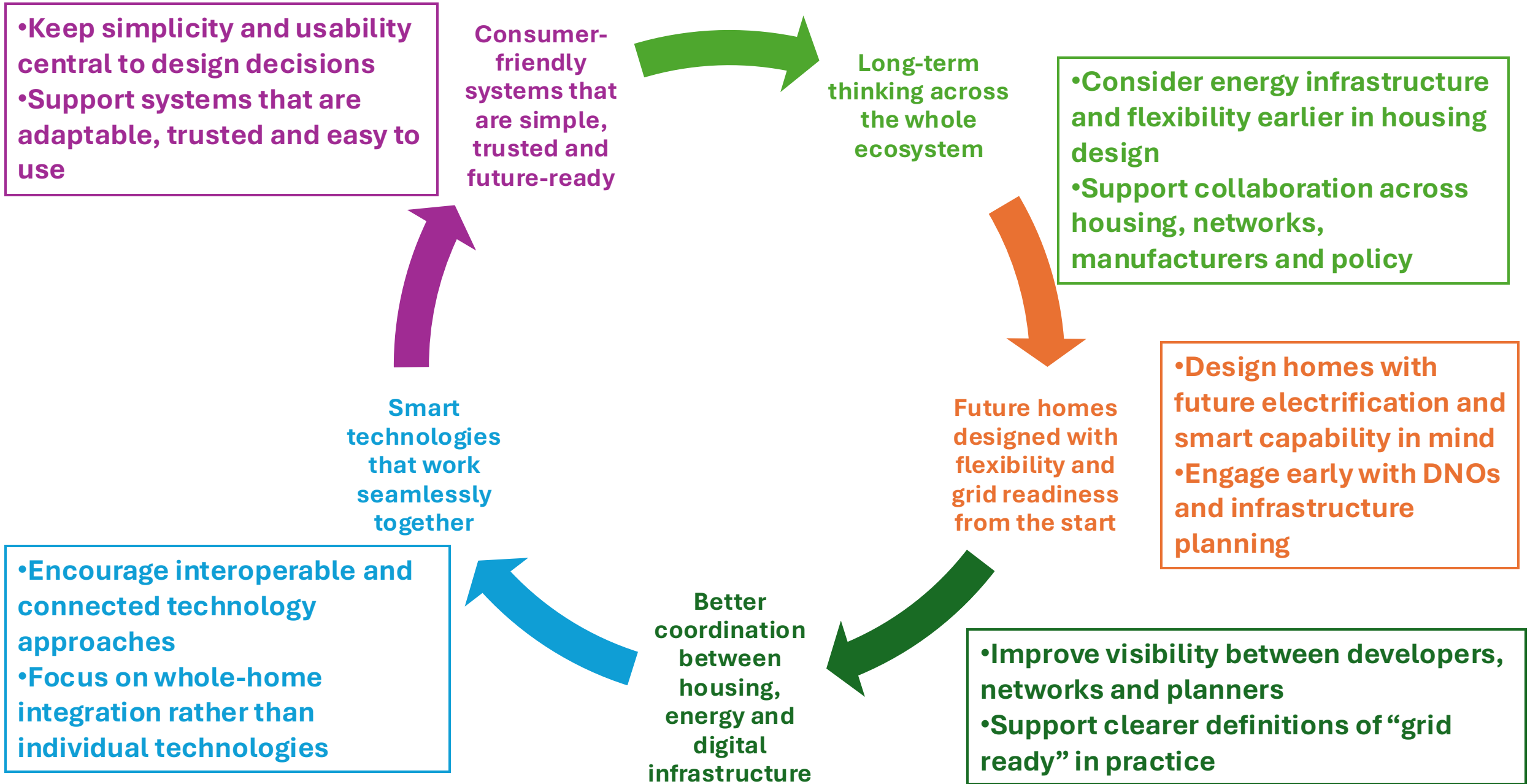
# What are the long-term benefits?



# Key Delivery Challenges for FHS and Smart Flexible Homes



# What does success look like?



# Powering up

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**Chief Product Officer**
SNRG

# Future Homes Standard Technical Conference

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# NETWORKING BREAK

## Coming up next...
## Learning by doing
## Wesley Suite (Programme B)




Be sure to share your experience on LinkedIn using #FHSReady