



WELCOME TO THE

Future Homes Standard Technical Conference



Be sure to share your experience on LinkedIn using #FHSready



Future Homes Standard Essentials

Sponsored by **e-on next**



David Adams

Strategic Advisor

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

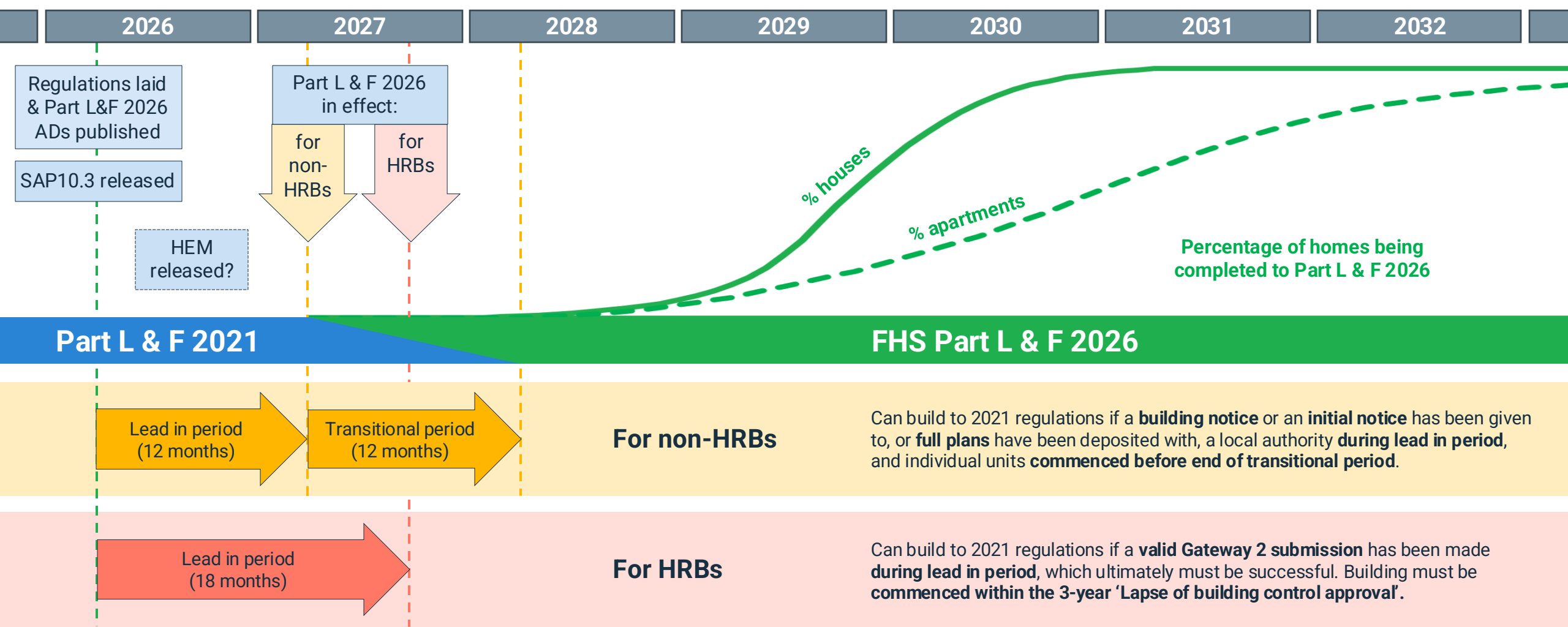


Part F 2026





FHS Timeline





The Future Homes Standard Essentials

Seven actions to de-risk delivery today





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

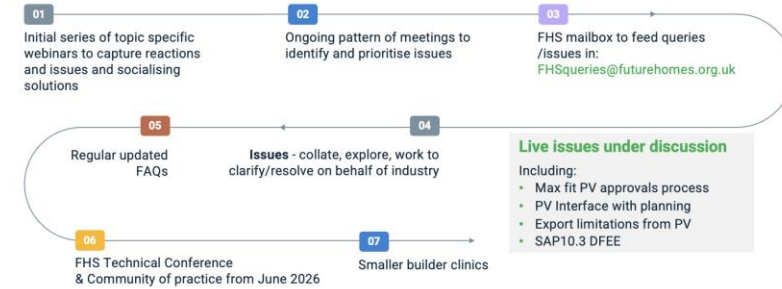
Appendix A - FHS ISSUES LOG

WORKING DOCUMENT

In Blue - Items added/updated since last issue

Updated: 01 Jun

Issue Title, Description & Comments	Subject	Grouping	Importance	Urgency	Rating (RU)	Status	Current Action by	Team to action	Suggested Actions	Relevant Doc	Section
Guidance for consistency of interpretation of PV 'Max fit' requirements Related items: #10, #11, #12, #13, #15, #16	PV	PV2 - 'Max fit'	0.9	1	1	1	FHS	PV DACPG	Future Homes Hub to set up 'PV design and compliance process' group	Part L	Para 5.73(b) & Appendix B
"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 kWh/m ² "	PV	PV2 - 'Max fit'	1.0	1	1	1	FHS	PV DACPO	Future Homes Hub to set up 'PV design and compliance process' group	Part L	
Guidance on roof vent acceptable and unacceptable locations - length of ductwork may increase if relocate to make way for PV panels. What implications does this have for ventilation system design? - potentially could be quite a few vents, especially if using purge vents for Part G compliance under terms of downpipes - what 'rules' should be applied around location of vents, especially in 'Max fit' scenario?	PV	PV3 - For apartments	1.0	1	1	1	FHS	PV DACPO	- FHS to develop/collate list of contender examples - Homebuilders to provide supporting evidence	Part L	Para 5.76
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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	All things PV Wesley Suite (Programme B)
10:10 - 11:00	Feeling the heat: part 1 Wesley Suite (Programme B)
11:00 - 11:30	Morning Break and Exhibition
11:30 - 12:20	Fabric first & reactions to SAP 10.3 Wesley Suite (Programme B)
12:20 - 13:10	Powering up Wesley Suite (Programme B)
13:10 - 14:00	Lunch and Exhibition
14:00 - 14:50	Fresh thinking on ventilation & IAQ Wesley Suite (Programme B)
14:50 - 15:40	Feeling the heat: part 2 Wesley Suite (Programme B)
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 <i>sponsored by PassivUK</i>



Future Homes Standard Technical Conference



All things PV



David Adams
Strategic Advisor
Future Homes Hub



Neil Macdonald
Principal Technical
Specialist
NHBC



Jack Taylor
Technical Director
Allume Energy



Adam Tilford
Technical Innovation
Project Manager
Vistry



Mike Shields
Design and Estimating
Director
UPOWA Ltd



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All things PV

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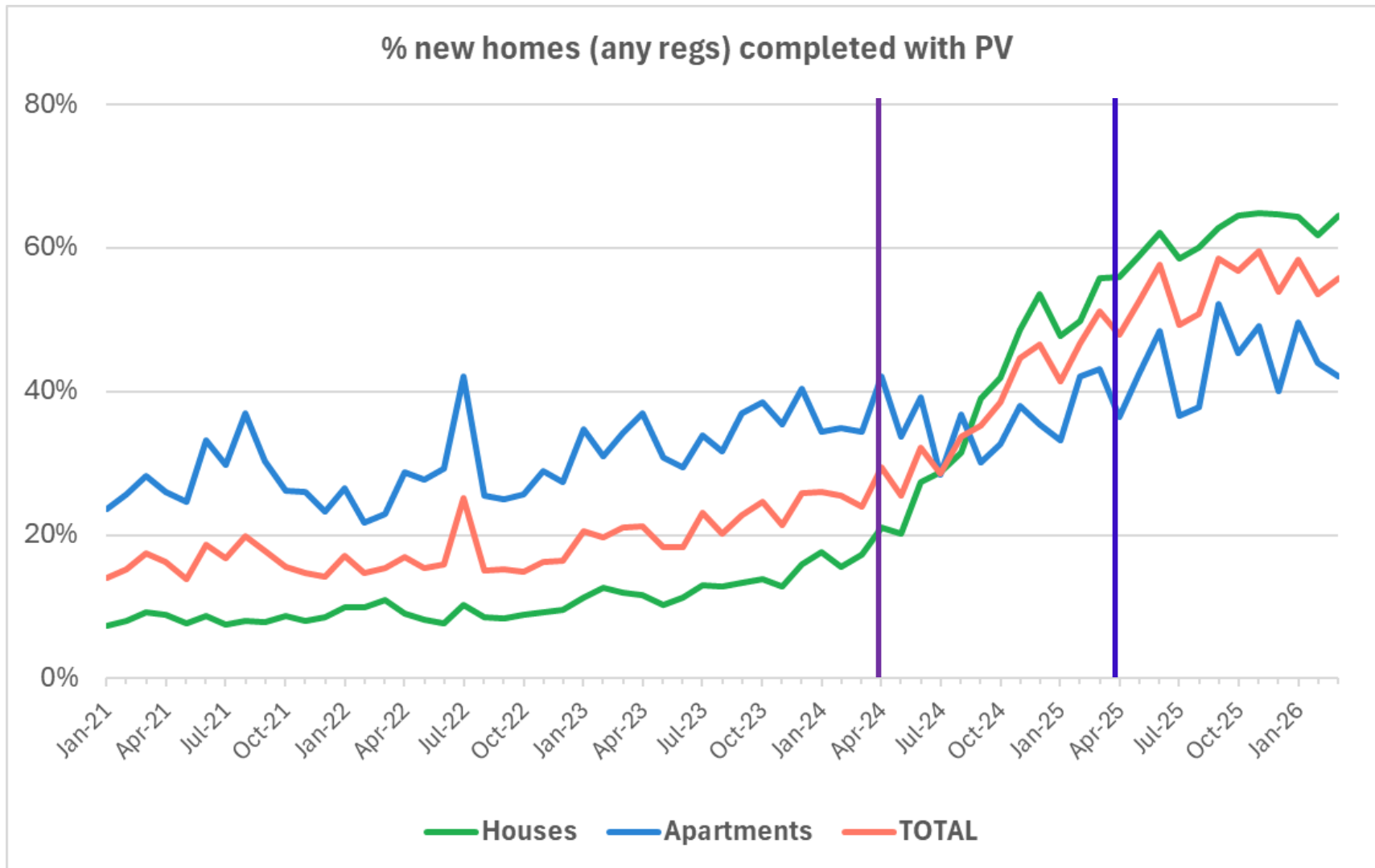
The Future Homes Standard Essentials

Seven actions to de-risk delivery today





PV on new homes





On-site generation of electricity

- L2.** Where a system for on-site electricity generation is installed—
- reasonable provision must be made to ensure that—
 - the system and its electrical output are appropriately sized for the site and available infrastructure;
 - the system has effective controls; and
 - 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.
- 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.
 - Installed peak power (kWp) equal to photovoltaic panels with an efficiency of 0.22kWp per m² installed over an area equivalent to 40% of the dwellinghouse's ground floor area (see equation 5.1).
 - Orientated south-east to south-west.
 - Pitch of 45 degrees.
 - Not overshadowed.
 - 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/m².

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—
- designed to enable generated electricity to be available for the use of residents of the dwellings;
 - 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—

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

- 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—

- 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

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

B1 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 0.22kWp/m². 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	39m ²
Photovoltaic area	16m 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

Updated: 01-Jun

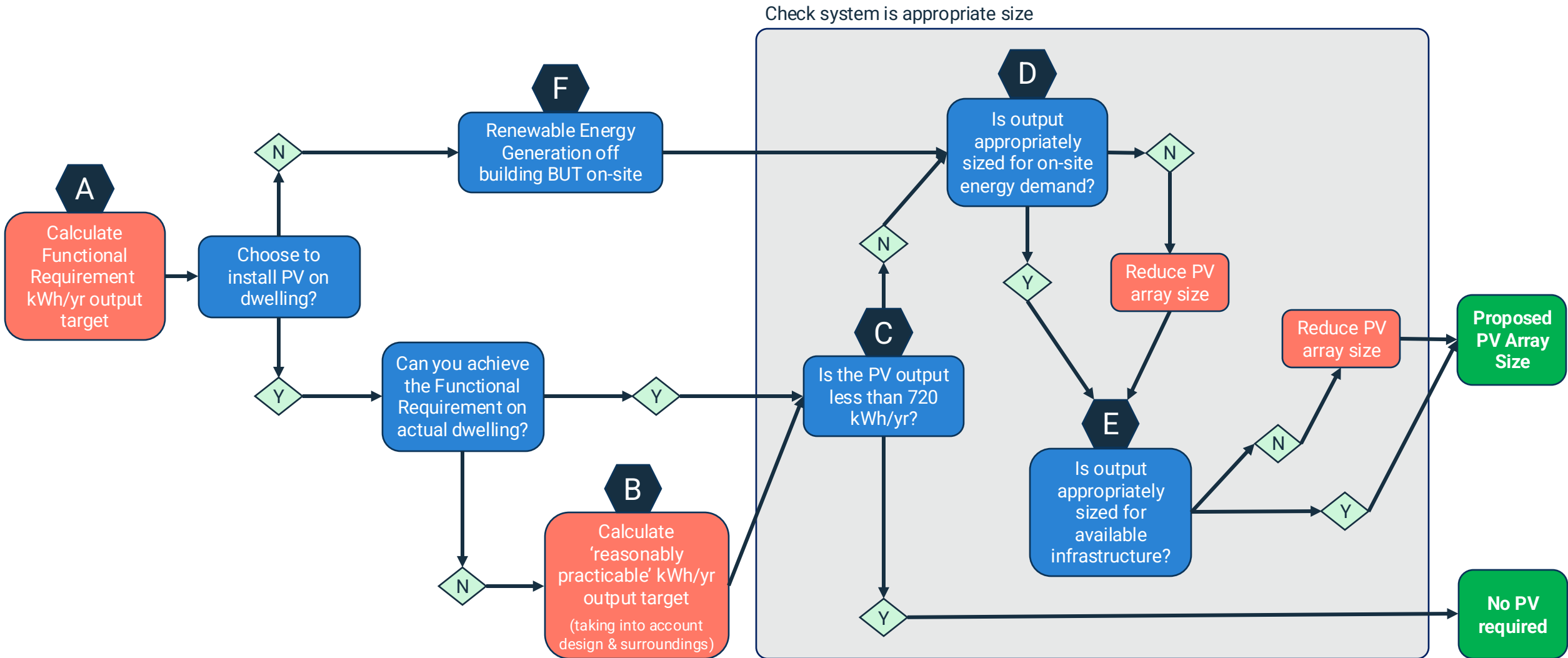
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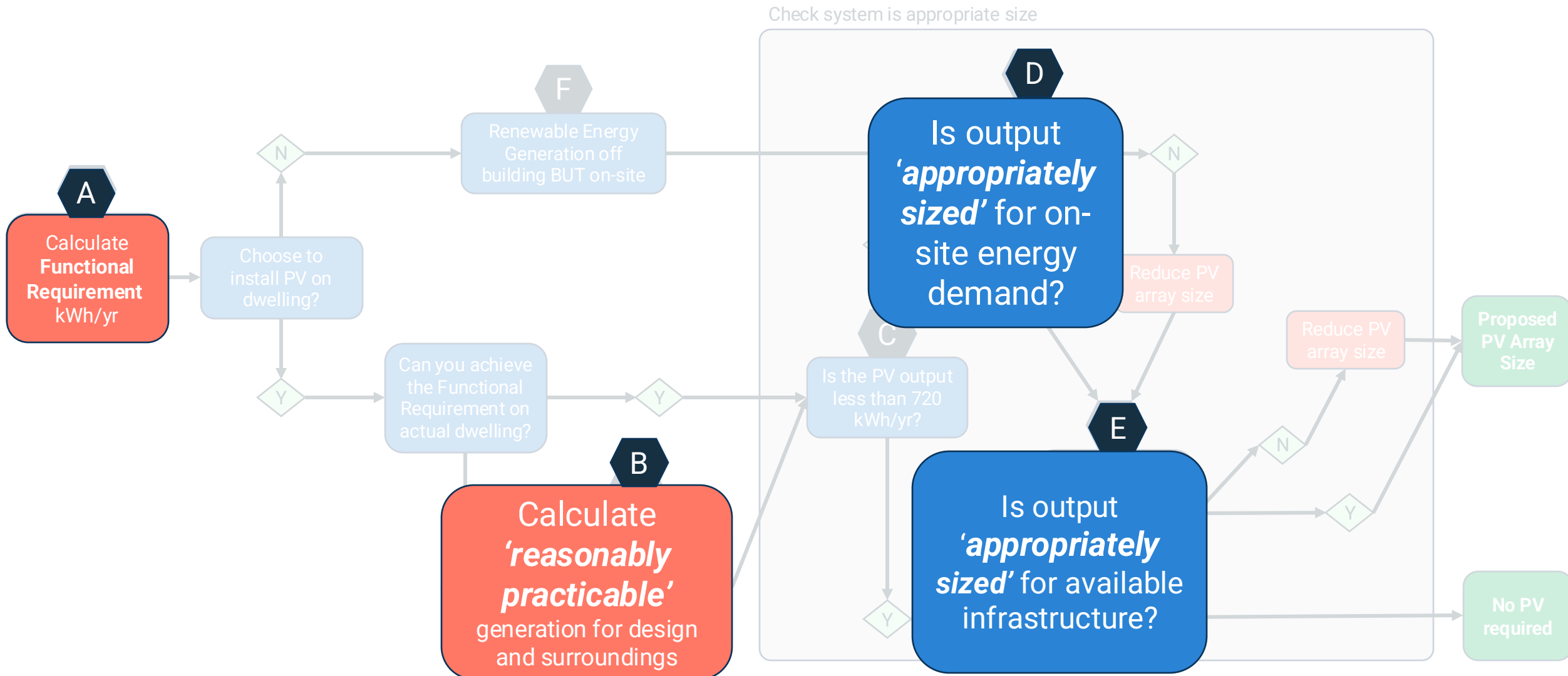
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FHS PV array size calculation process overview - Houses



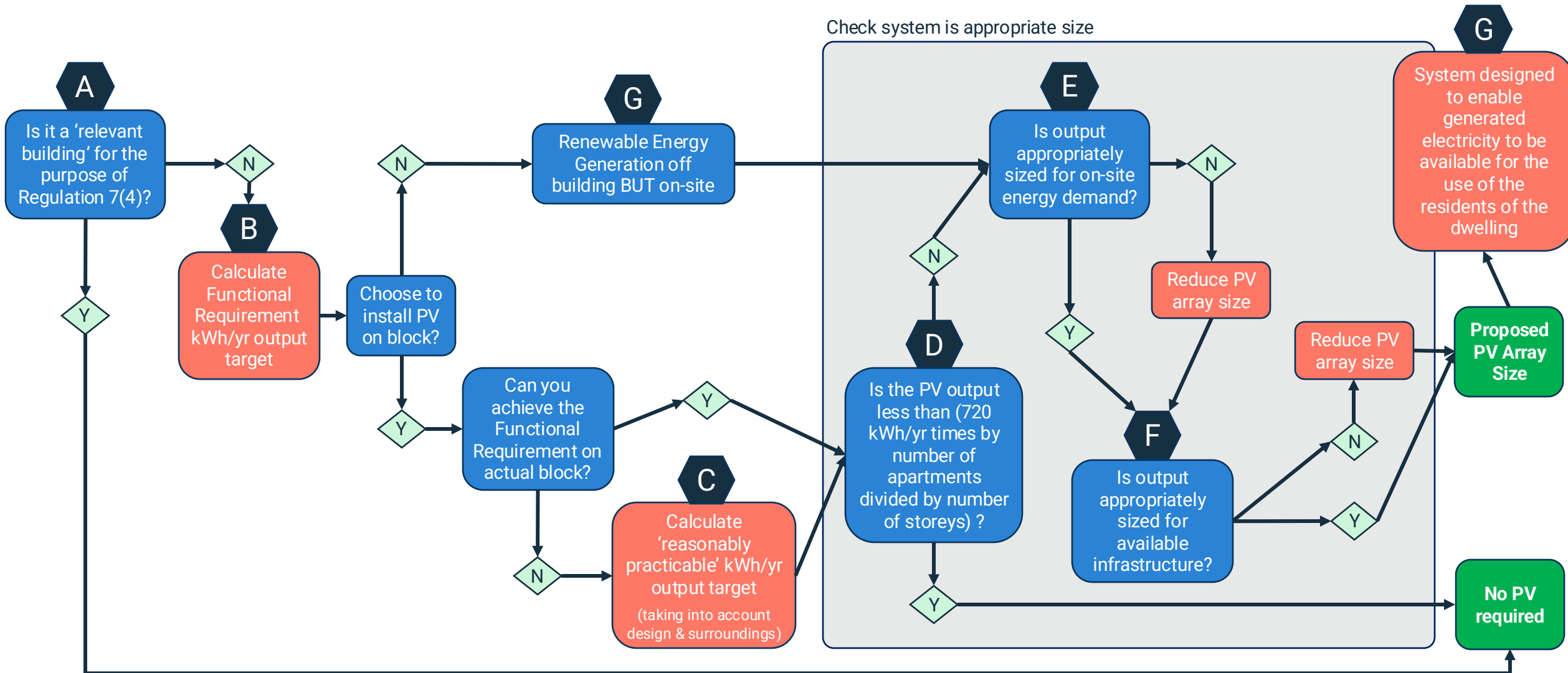
FHS PV array size calculation process overview - Houses



FHS PV array size calculation process overview

- Apartments

Block compliance route shown





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All things PV

Mike Shields
Design & Estimating Director
UPOWA Ltd

Future Homes Standard: Solar PV design considerations

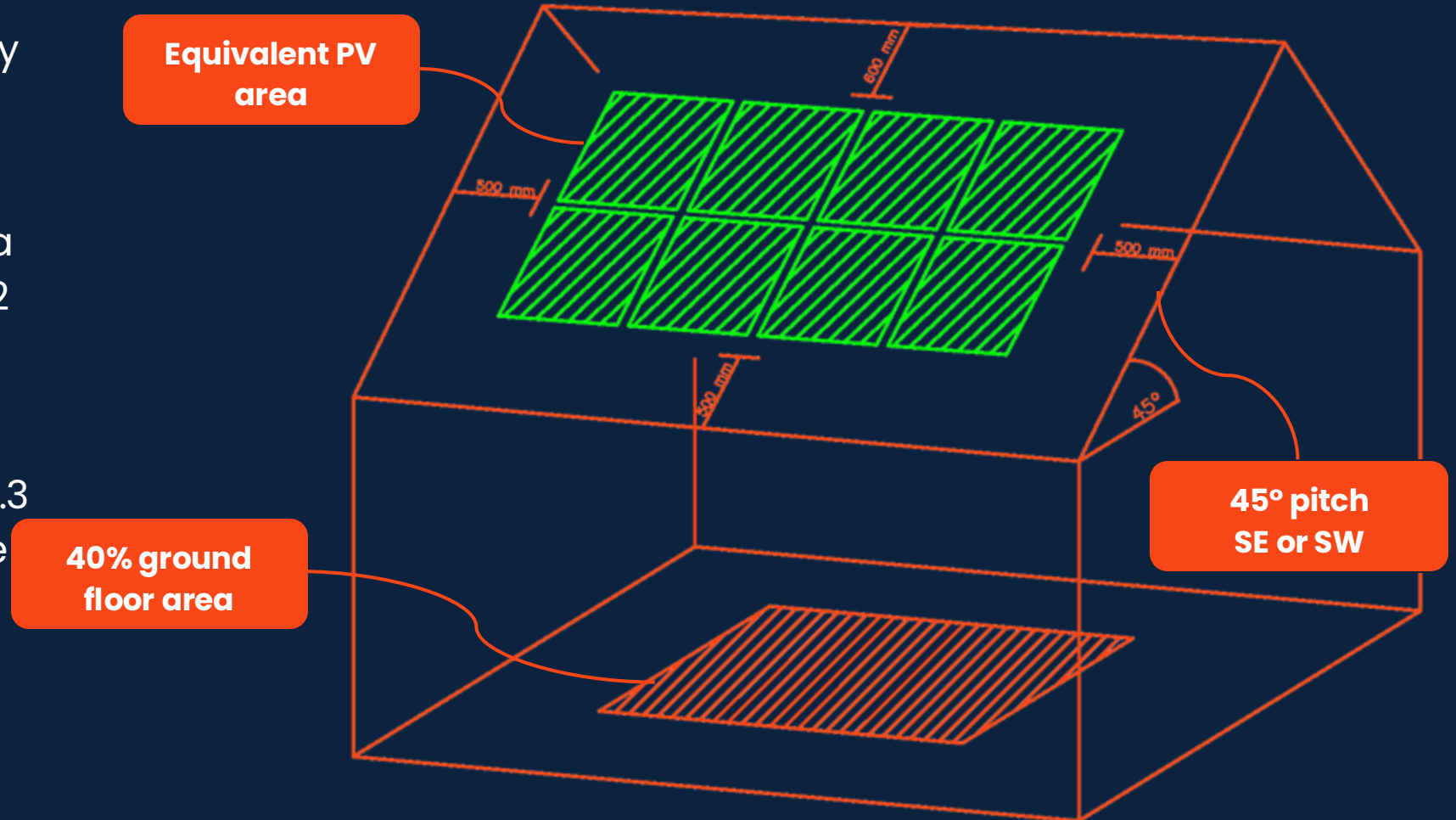
Solar PV is no longer a late-stage decision — it's a design constraint.

Mike Shields
Design & Estimating Director, UPOWA



Understanding the PV compliance challenge

- ✓ Based on approximately 40% of the dwelling's ground floor area
- ✓ Assumes solar PV with a minimum output of 0.22 kWp/m²
- ✓ Annual energy yield calculated using SAP 10.3 and, in future, the Home Energy Model

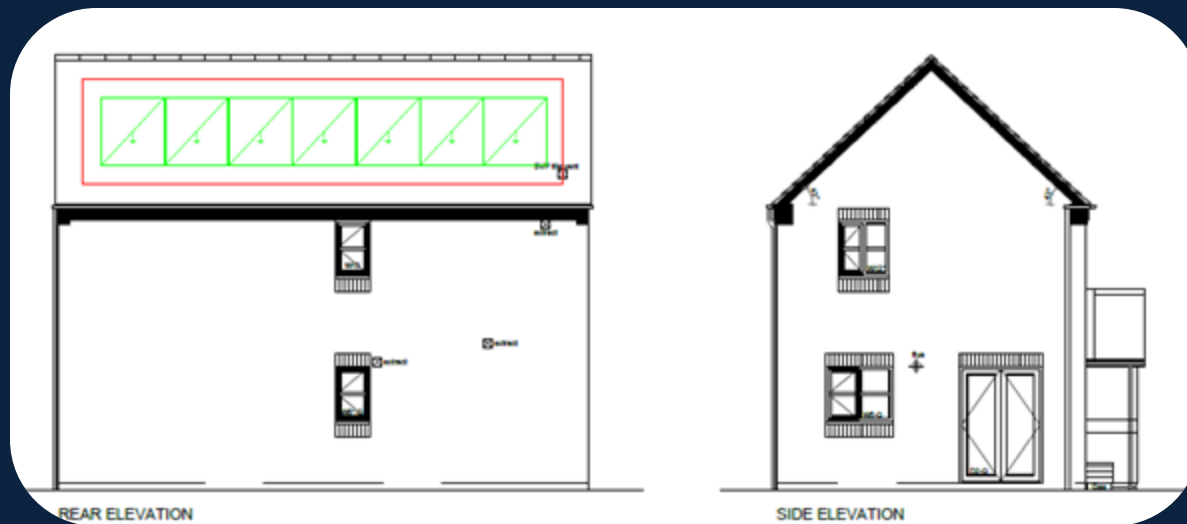


What does a compliant PV design look like?

Simple roofs = simpler compliance

- ✓ Simple roof geometry
- ✓ Large uninterrupted roof planes
- ✓ Minimal roof obstructions
- ✓ High roof utilisation
- ✓ Greater opportunity to achieve target provision

Good solar PV design starts with good roof design



**FHS Pass ✓
Max-fit PV
design**

Following current offset requirements and proposed Part B clearance recommendations

Key roof design constraints

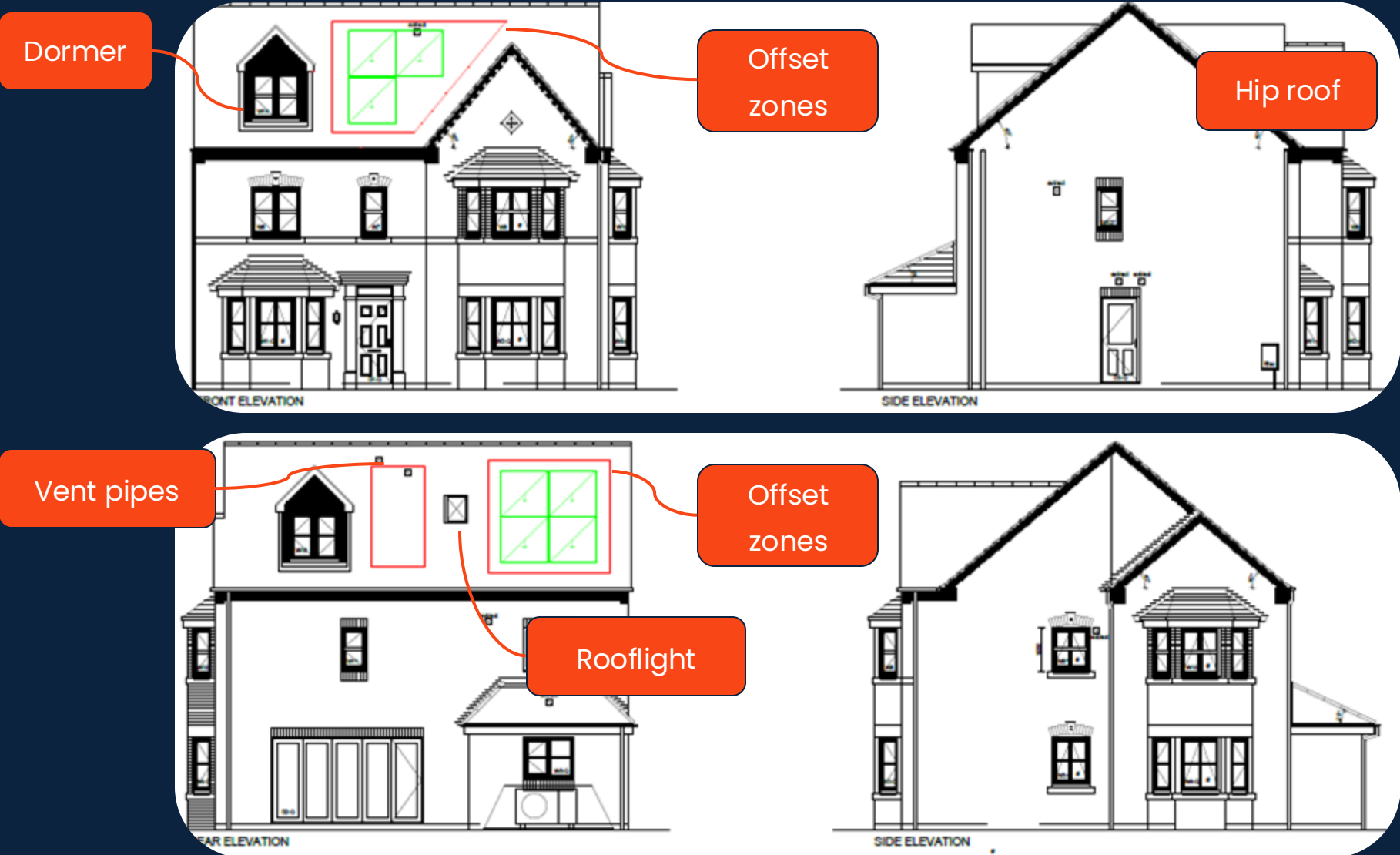
FHS Fail Max-fit PV design

Target 7.44 kWp

Result = 3.15 kWp

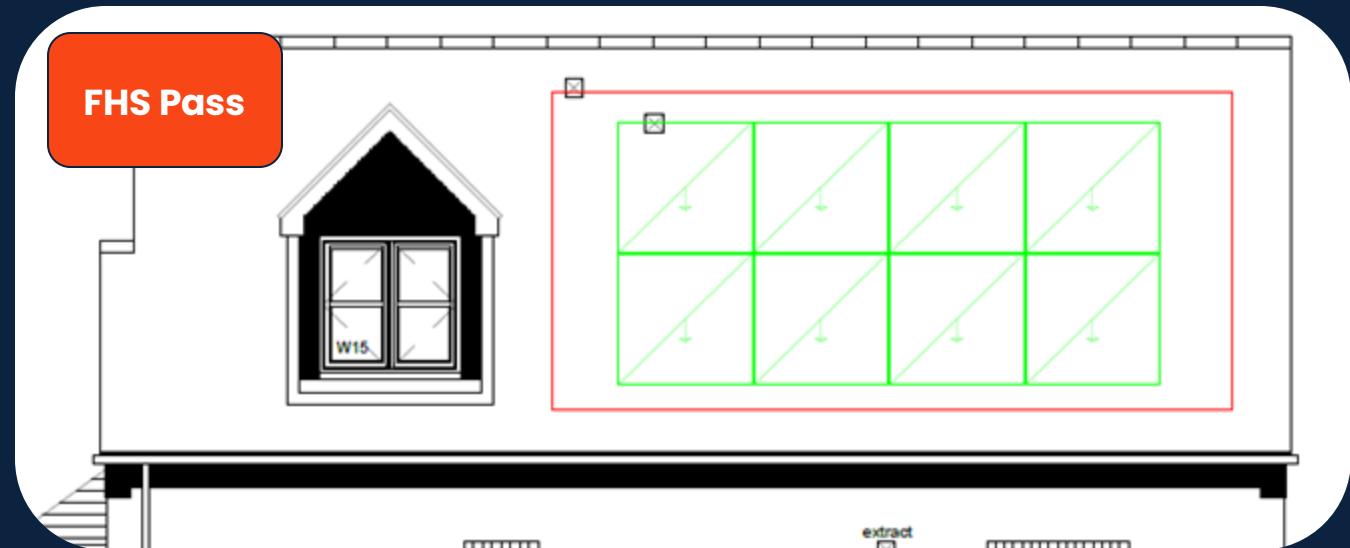
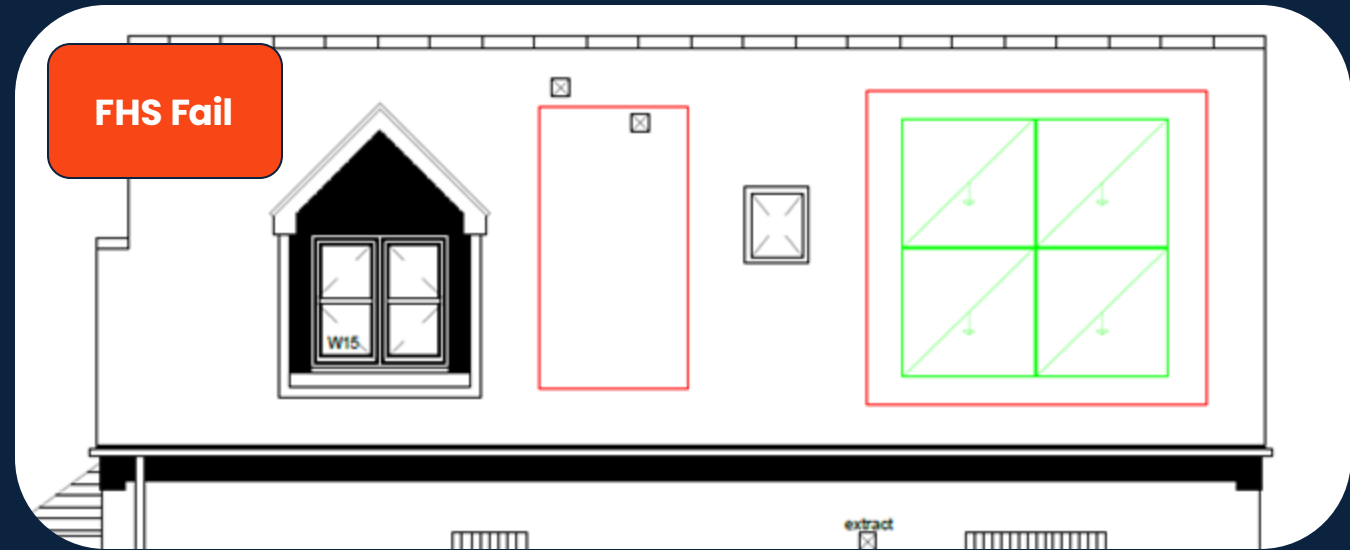
10 x PV panels missing

Total roof area does not equal usable roof area

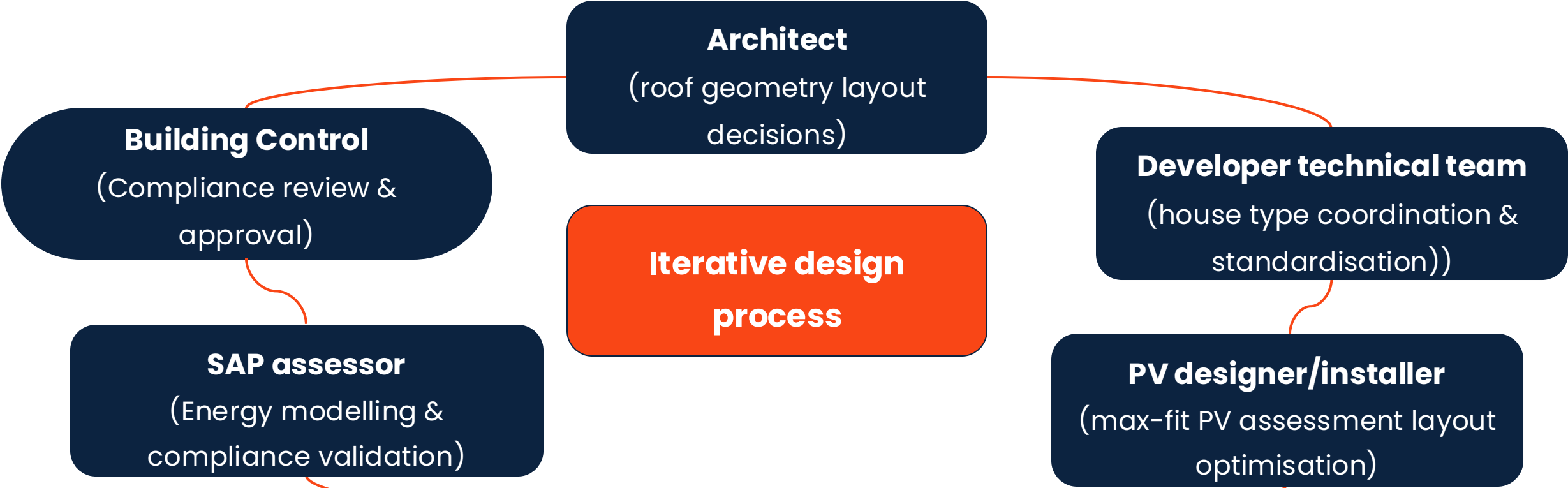


If the 40% requirement cannot be met

- ✓ Complete max-fit assessment in accordance with Approved Document L
- ✓ Identify opportunities to increase usable roof area (e.g relocating rooflight & vents)
- ✓ Reassess achievable solar energy yield
- ✓ Submit supporting evidence to Building Control where required



Designing for compliance



Early collaboration creates greater opportunity for compliance

What next...

Assess early

Review housetypes and identify compliance risks

Optimise early

Maximise usable roof area and solar provision

Design for delivery

Embed PV into the design process from the outset

**Future Homes Standard compliance doesn't start on site.
It starts at the drawing board.**



Future Homes Standard Essentials

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All things PV

Jack Taylor
Technical Director
Allume Energy

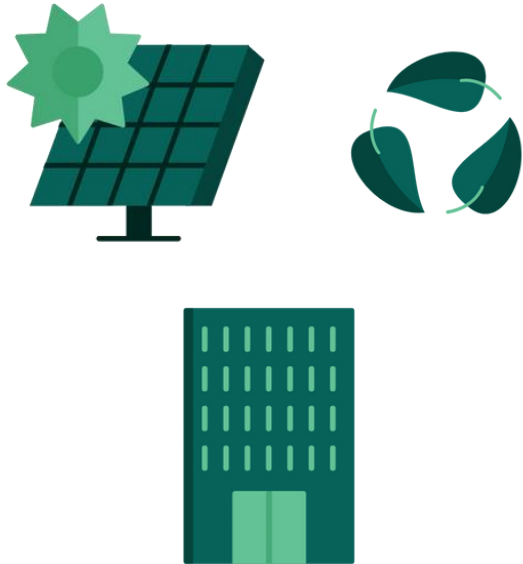


SolShare

Jack Taylor, General Manager of Europe
jack.taylor@allumeenergy.com
allumeenergy.com



HEM specifies **40% PV**



Solar brings benefits under SAP and HEM

However, PV for flats has always been **challenging**

Turn this **requirement into an opportunity** with Shared Solar

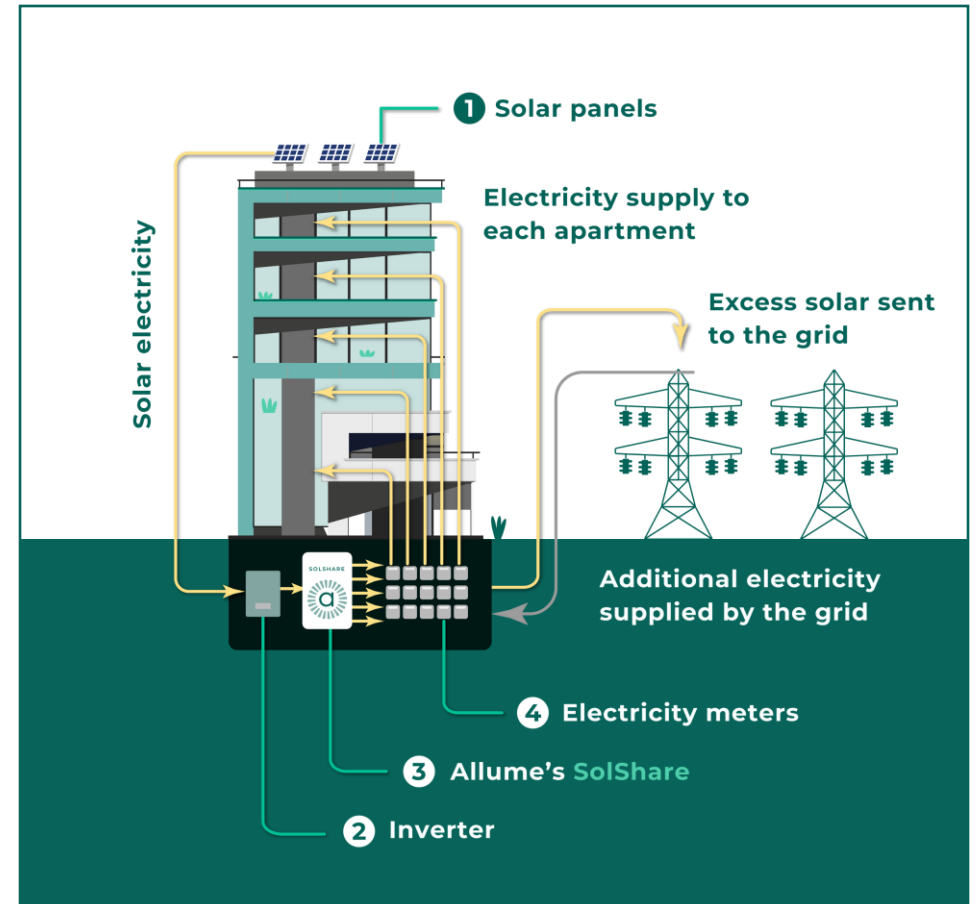
Allume has created **SolShare**

- **SolShare:** World's only solar system to directly connect multiple flats to a single rooftop PV and battery.
- A proven solution to over **10,000 flats.**



Benefits of SolShare (shared solar & battery system)

- ✓ Direct PV connection to individual flats
- ✓ Tailorable kWp: typically delivering 5–15 SAP points.
- ✓ 20–50% bill savings for residents (solar only).
- ✓ Solves fire safety concerns
- ✓ Easy, affordable & less intrusive energy efficiency measure.
 - All at a cost of approx. £1.5 – 4k per flat (turnkey).





Future Homes Standard Essentials

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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



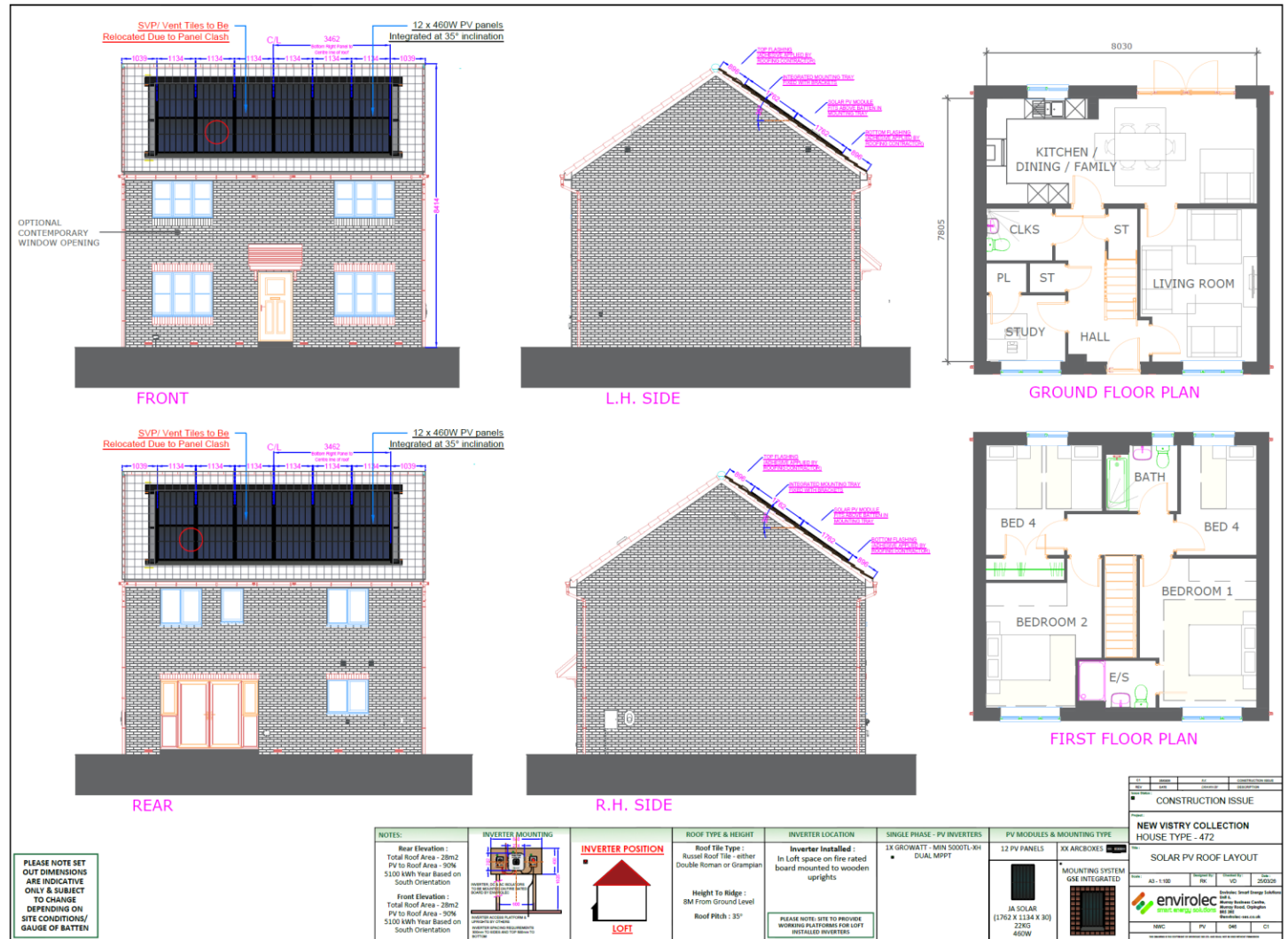
Understanding the PV requirement

- 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



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
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Partnerships



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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



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Feeling the heat: part 1

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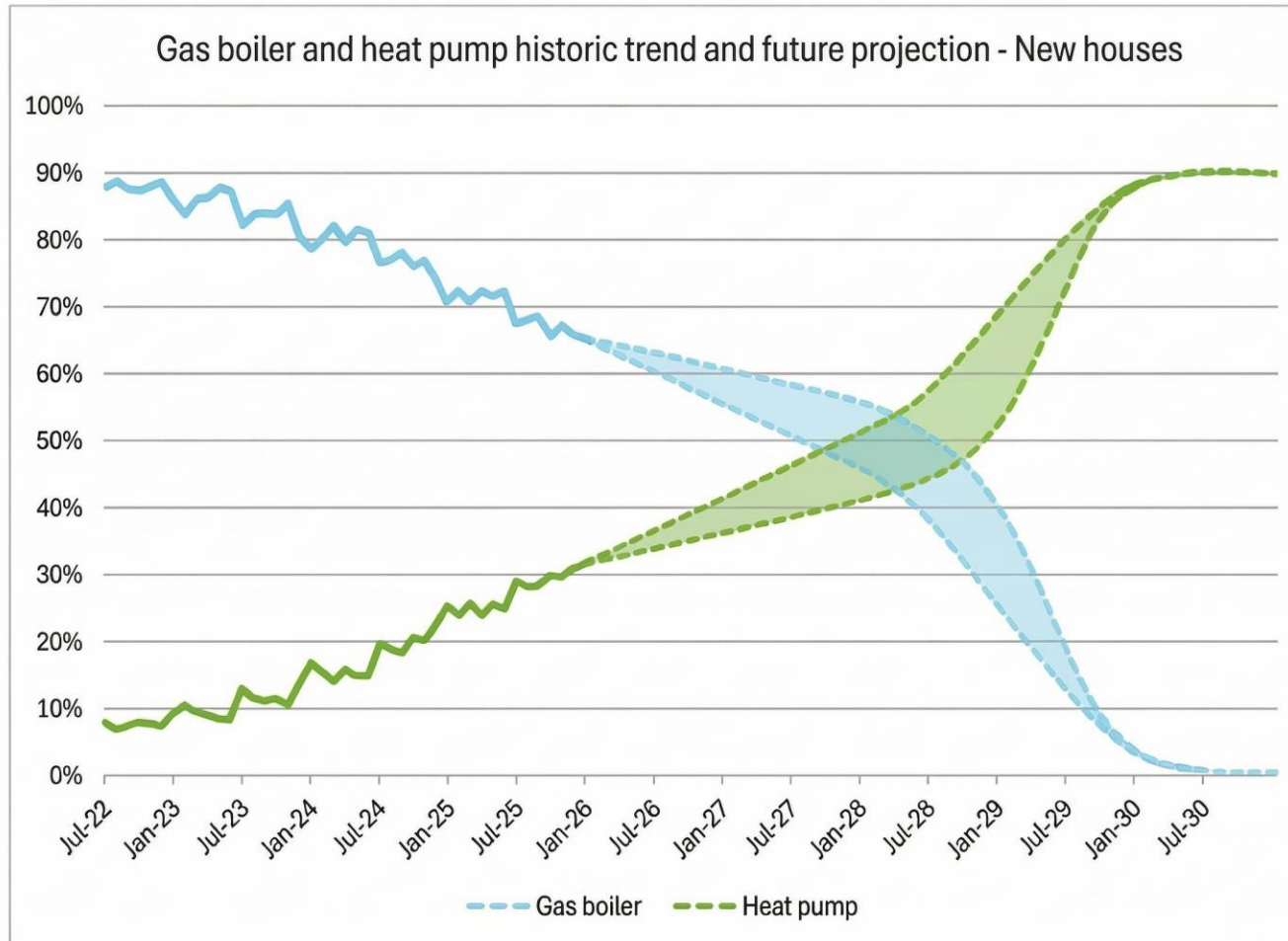


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Seven actions to de-risk delivery today

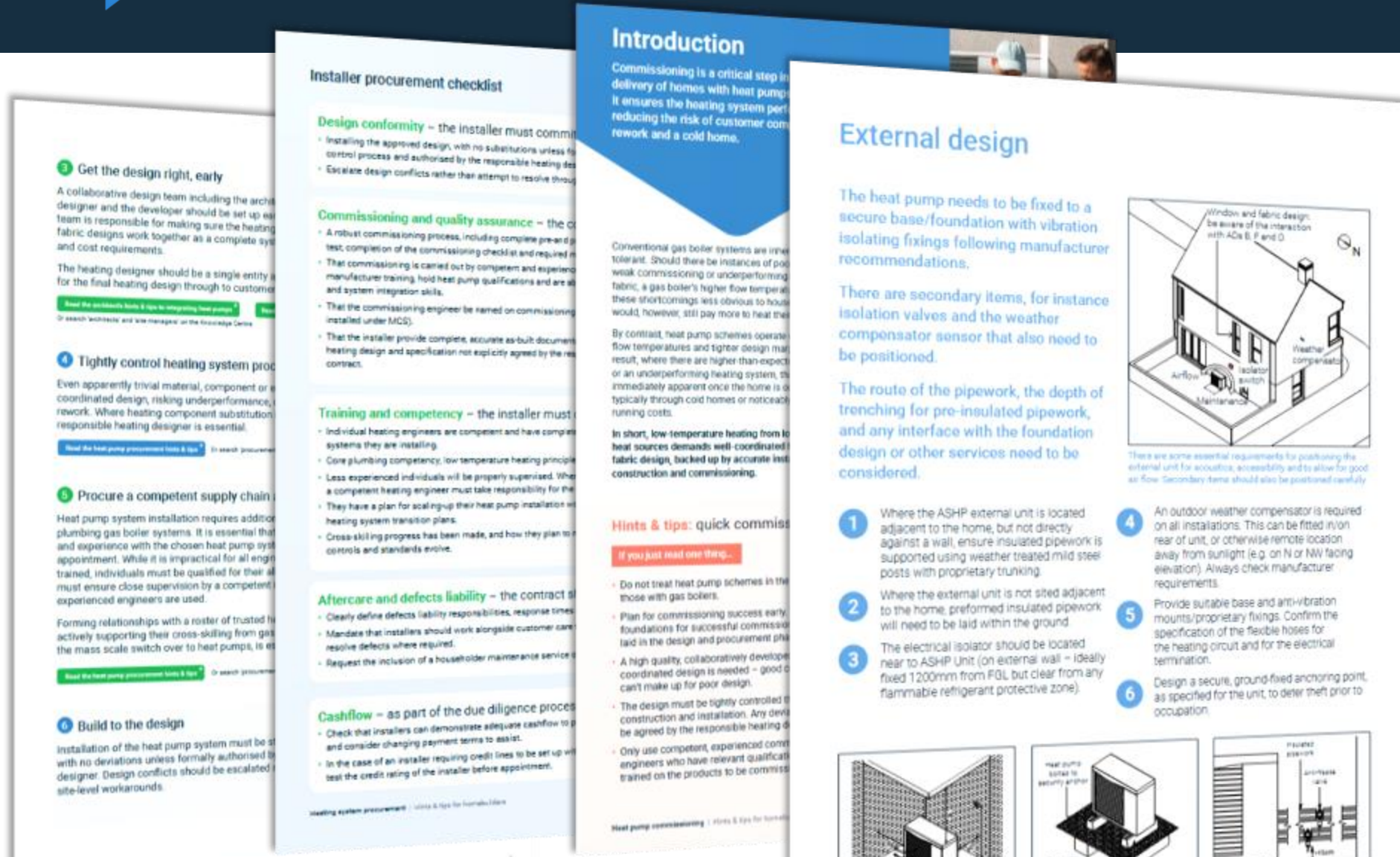


The sector is already scaling up



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

Some of our heat pump guidance

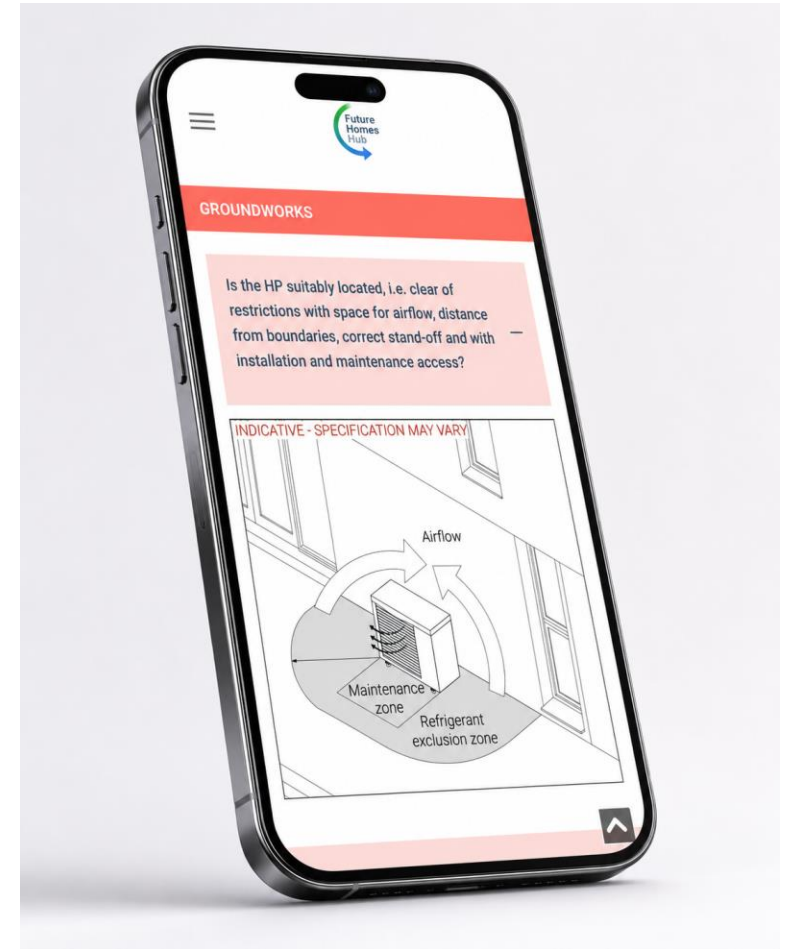
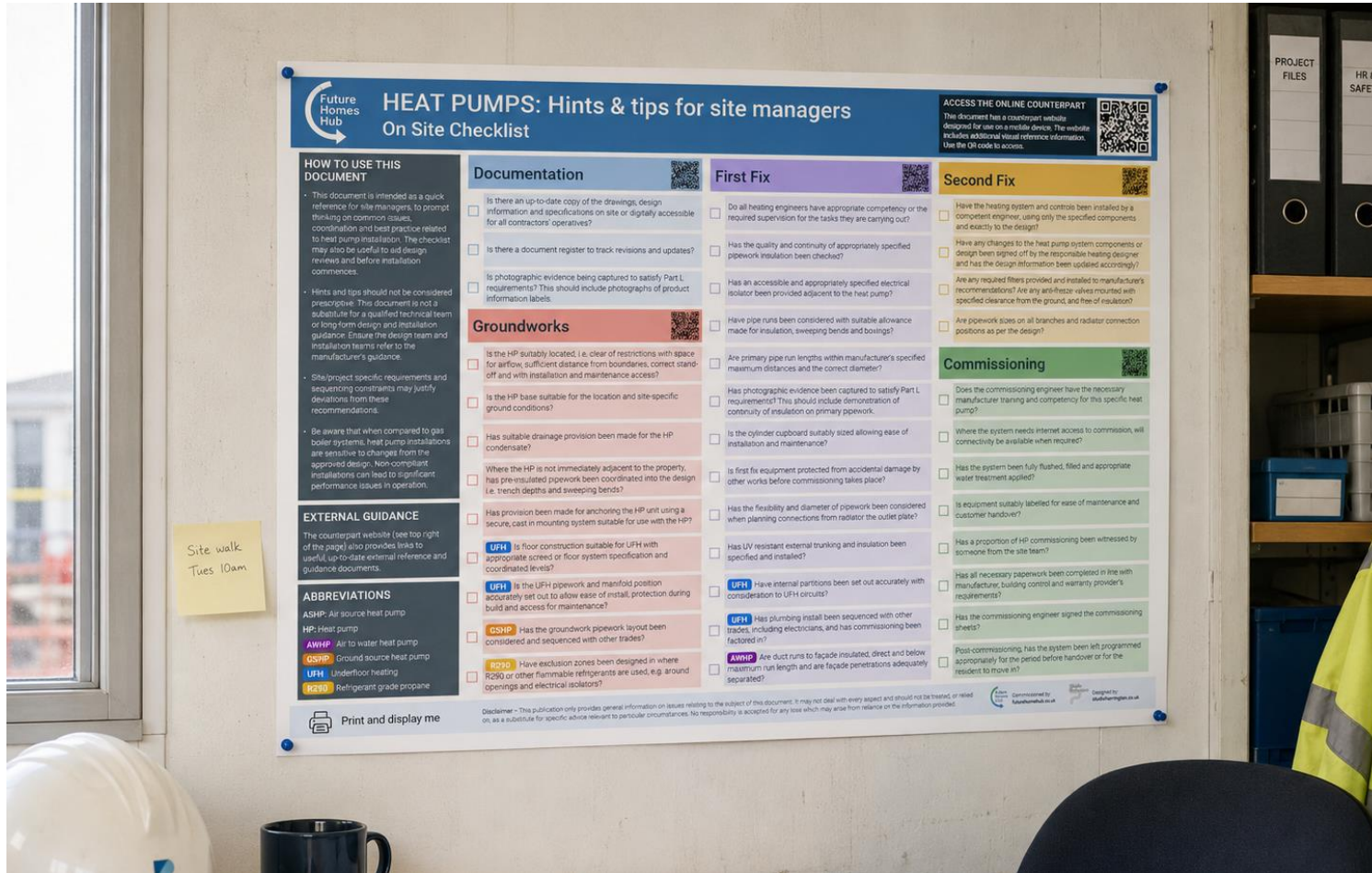


Including:

- 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

Updated: 01-Jun

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Future Homes Standard Essentials

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Feeling the heat: part 1

Dan Hastings

Group Technical & Innovation Manager

Barratt Redrow



Barratt Redrow

Feeling the Heat: The Developer's Perspective

Dan Hastings

Group Technical & Innovation Manager

June 2026

What Customers Said...



Two thirds said living in an energy efficient home was more important to them now than 12 months ago.

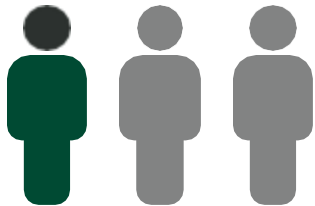


Energy efficiency is the **third** most desirable factor when considering a home purchase.



Low familiarity with Air Source Heat Pumps.

Our Research



A third (33%) say they would prefer to move into an energy efficient home, rather than trying to retrofit their current home with energy efficient features.



Energy efficient homes are one of the biggest ways Britons felt they can **make a difference** to the environment.

Early Engagement with Heat Pump Manufacturers

- **Learning** from their expertise.
- Early tender - pricing agreements put in place – surety of stock in the merchant chain.
- **Training** for installers, site teams, sales, marketing and customer service.
- Podcasts, videos, website content – **making customers aware** of the changes and highlighting the benefits.
- Focus on **energy efficiency**, future proofing, CO₂ reduction – not cost.
- Setting **customer expectations** – slow response, lower temperatures, continuous running.

The screenshot shows the Barratt Redrow website page for 'Setting up your heating and hot water'. The page includes a navigation bar with 'Find a Home', 'Schemes & Offers', 'Buying with Barratt', 'Buying Guides', and 'Advice & Inspiration'. The main heading is 'Setting up your heating and hot water' with a sub-heading 'Ensuring your home is as cosy as possible means keeping it at a comfortable temperature and having hot water at the turn of a tap. A bit of background knowledge about your central heating will help it run efficiently, save you money and give it a long life.' Below this, there are sections for 'How your heating system works', 'Types of central heating system', and 'Air source heat pump'. The 'Air source heat pump' section includes a small image of a Vaillant heat pump unit and text explaining how it works and the importance of settings.

The screenshot shows a Redrow website page with a red background. The main heading is 'HOW WE'RE USING AIR SOURCE HEAT PUMPS TO BOOST ENERGY EFFICIENCY'. Below the heading is a date '11TH SEPTEMBER 2024' and a 'SHARE' button. The central image shows a Vaillant air source heat pump unit installed on a brick wall. The page also includes a navigation bar with 'Find a new home', 'Locations', 'My Account', 'Discover Redrow', and 'News and Inspiration', and a footer with 'Contact us' and 'Customer Support'.

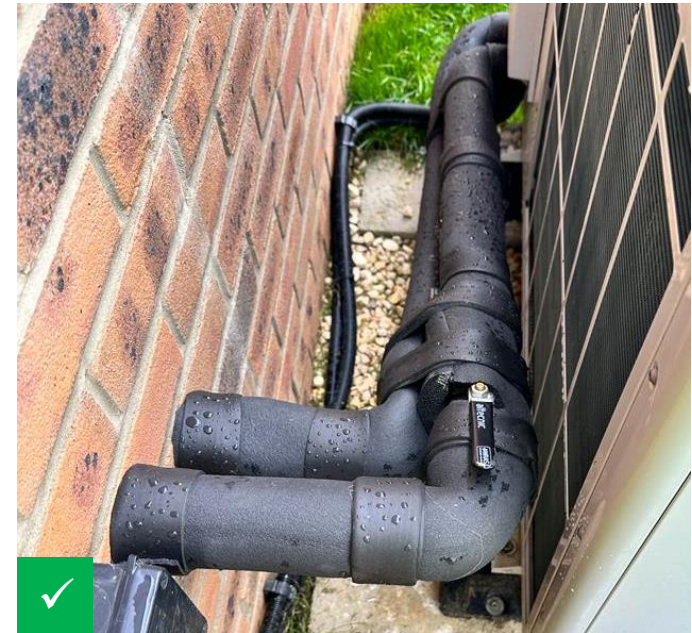
The YouTube video thumbnail features a woman in a red jacket standing next to an air source heat pump unit. The text on the thumbnail reads 'What to expect from your air source heat pump' at the top, 'AIR SOURCE HEAT PUMPS' in large white letters in the center, and the Redrow logo at the bottom. A 'Watch on YouTube' button is visible in the bottom left corner, and a 'Share' icon is in the top right corner.

The YouTube video thumbnail shows a man with a beard and a dark jacket smiling. The text on the thumbnail reads 'Underfloor Heating now included as Standard' at the top, a large red play button in the center, and the Redrow logo at the bottom. A 'Watch on YouTube' button is visible in the bottom left corner, and a 'Share' icon is in the top right corner.

The YouTube video thumbnail shows three people sitting at a table in a kitchen setting. The text on the thumbnail reads 'The New Homes Podcast - Episode 28 | Air sou...' at the top, 'NEW HO... PODCAST' in a red box in the center, and 'AIR SOURCE HEAT PUMPS' in large white letters at the bottom. The Redrow logo is at the bottom right. A 'Watch on YouTube' button is visible in the bottom left corner, and a 'Share' icon is in the top right corner.

Product Trials

- All manufacturers' products were put through on site testing with real customers – very small-scale rollout to begin with.
- Monitoring of energy use to gauge real world COP.
- Valuable insight into real running costs and customer experience.
- Radiator sizes influenced the decision to move to underfloor heating.
- Allowed installers to gauge similarities and differences of products.
- Refinement of Standard Details – list of ancillaries e.g. feet, flexi-hoses, anti-freeze valves, pipe insulation kits, trunking.
- Comparing and contrasting of designs led to an agreed set of design criteria – prior to updated NHBC/CIBSE guidance.
- Agreement from manufacturers and designers on consistent design approach – room temps, air change rates, ext temp.



Practical Issues

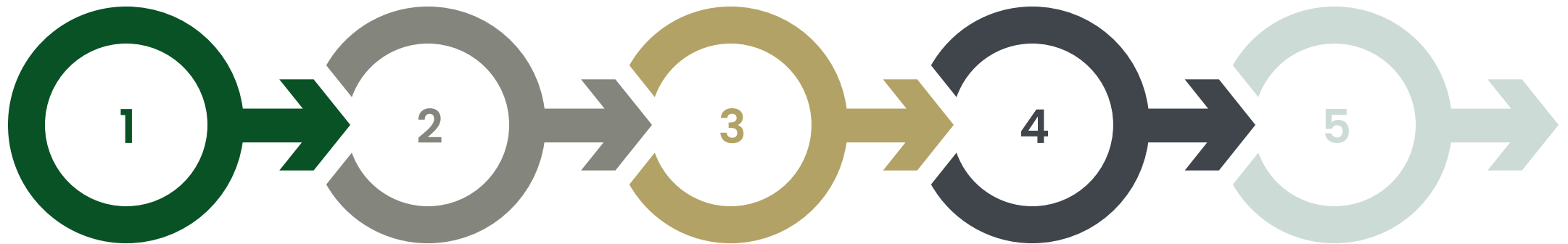
- Siting of external units – consider clearance/safety zones. Needs to be planned early on to suit external works, levels, paths, gates etc.
- Impact on house type designs – window cill heights, patio door positions.
- Size and weight of hot water cylinders – consider loading on joists, additional equipment in cupboards e.g. buffer vessels.
- Positioning and insulation of flow/return pipework.
- Protection of heat pumps once they're fitted – heat pump covers.
- Security concerns – just in time delivery to site, early erection of fences and gates, holding down bolts.



Heat Pump Covers



Heat Pump Mover



1

Design:

Comprehensive design information to recognised standards.
Equipment schedules.
Standard details.

2

Training:

Make sure installer training is mandated. Include site, sales and customer service teams (manufacturers will help).

3

Commissioning:

Standard process. Documented and recorded.

4

Handover

– think of what information the customer needs. User guides, FAQ's, maintenance, warranty.

5

Continued improvement and **innovation**



Future Homes Standard Essentials

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Feeling the heat: part 1

Dan Roberts
Technical Director

Kensa

Delivering Heat Pump Systems that Work

Presented by: Dan Roberts



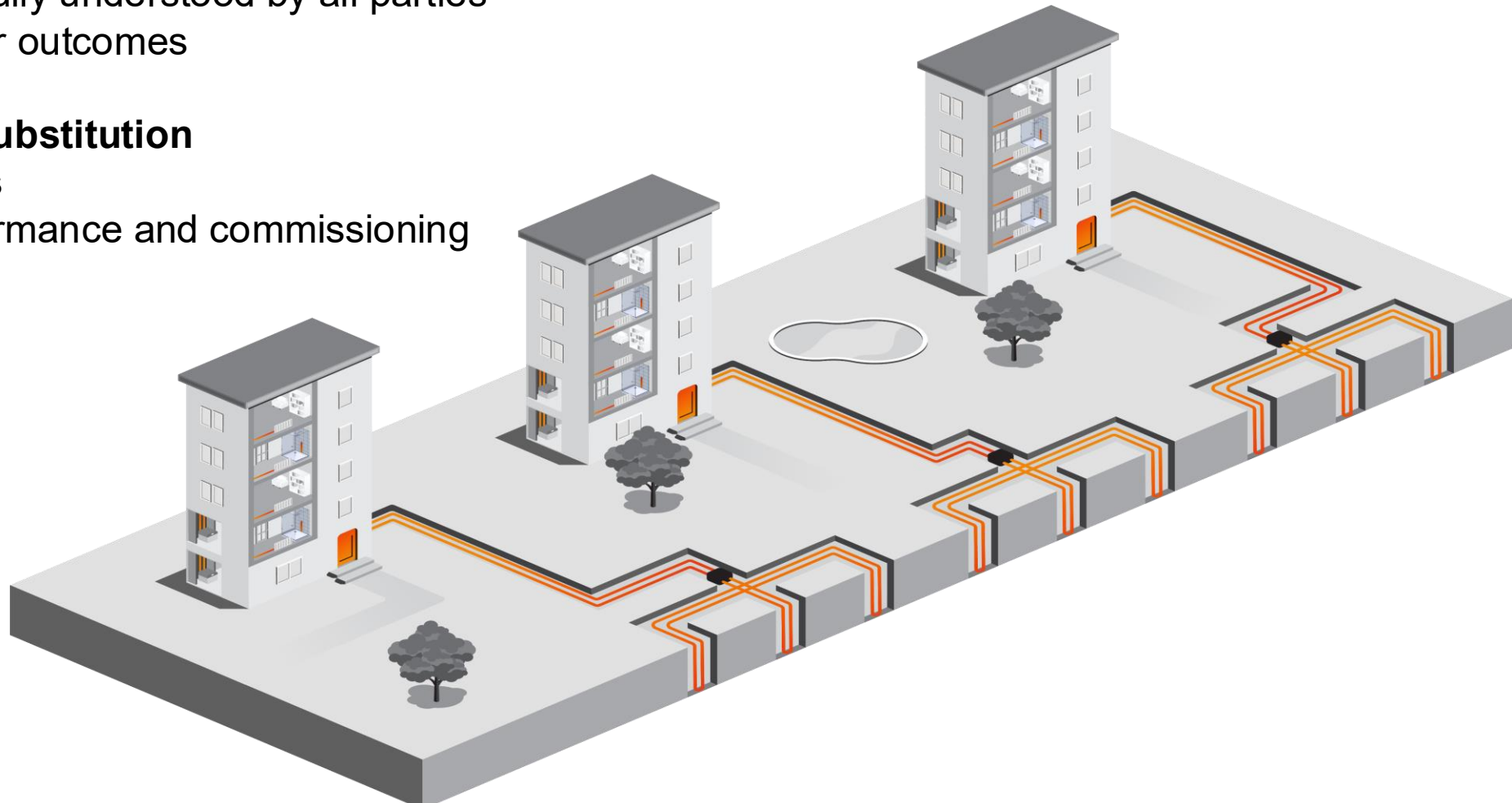
Heat Pumps work when the system works!

- Often technology isn't the issue, delivery is.
- Most issues come from uncontrolled fragmentation across
 - Design
 - Procurement
 - Installation
 - Handover
- Success comes from co-ordinated, accountable delivery.



Get design right – and protect it through delivery.

- Whole-system design must be:
 - coordinated
 - ownership must be fully understood by all parties
 - Focused on end user outcomes
- Key risk: **uncontrolled substitution**
 - “like-for-like” rarely is
 - breaks system performance and commissioning



Manufacturers training must go beyond the box

- Not just how the unit works
- But how the system performs
 - Design intent
 - Controls and integration
 - Commissioning outcomes
- **What good looks like:**
- Training aligned to **system design intent**
- Covers:
 - Design assumptions
 - Controls strategy
 - Commissioning requirements
- Focused on **real-world failure modes**, not theory



“Train the system not the component”

“This only works if we treat it as a partnership—developers, manufacturers, and delivery teams aligned early and designing for repeatability.

Where that happens, we’re already seeing projects de-risk, costs reduce, and delivery improve. The opportunity now is to make that the norm, not the exception.”



Future Homes Standard Technical Conference



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



Future Homes Standard Technical Conference



NETWORKING BREAK

Coming up next...
Fabric first and reactions to SAP 10.3



Be sure to share your experience on LinkedIn using #FHSReady



Future Homes Standard Technical Conference



Fabric first and reactions to SAP 10.3



Ross Holleron
Head of Homes and
Construction
Future Homes Hub



Rory Bergin
Partner for
Sustainable Futures
HTA Design



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Jason Hewins
New Build Dwellings
Manager
Elmhurst Energy



Alex Naraian
Group Head of
Technical
Churchill Living Ltd



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Fabric first and reactions to SAP 10.3

Jason Hewins
New Build Dwellings Manager
Elmhurst Energy

SAP 10.3 and Fabric

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.

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.

- The notional dwelling contained the following changes for fabric;

	Part L 2021	Part L 2026 (FHS)
Floor (w/m ² k)	0.13	
Wall (w/m ² k)	0.18	
Roof (w/m ² k)	0.11	
Door (w/m ² k)	1	
Window (w/m ² k)	u-1.2, g-0.63	u-1.2, g-same as actual
Airtightness	5 m ³ /m ² /hr @ 50 Pa	4 m ³ /m ² /hr @ 50 Pa
Ventilation	Natural with intermittent fans	Continuous dMEV, 0.15 w/l/s

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.



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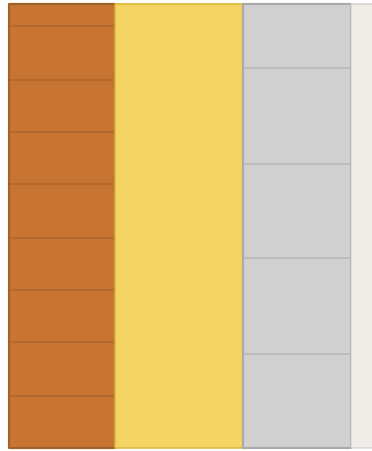


Fabric first and reactions to SAP 10.3

Michael Brogden
Technical Director

Darren Evans

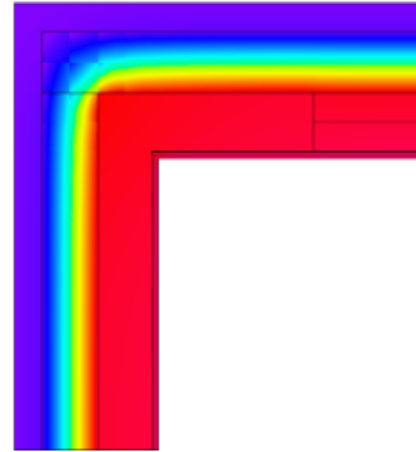
Masonry Construction



Brick Insulation Block

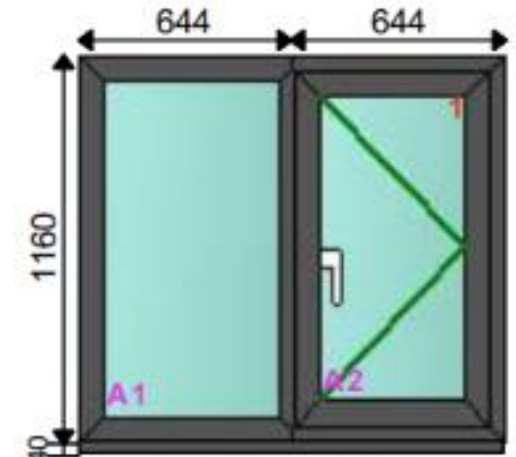
Cavity Widths

100mm still feasible in certain configurations



Psi Values

Greater availability of industry calculations



Windows

Double glazing works. Triple gives comfort

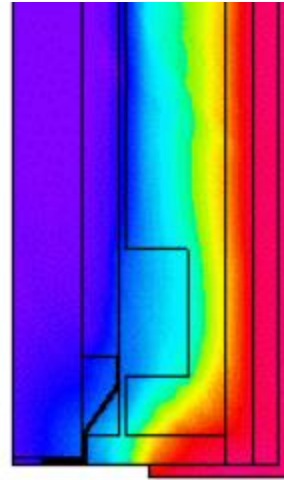
- **Air testing targets are slightly more relaxed**
- **Block compliance no longer permitted on terraced housing**
- **More detailed information to be provided earlier to energy assessors**

Timber Construction



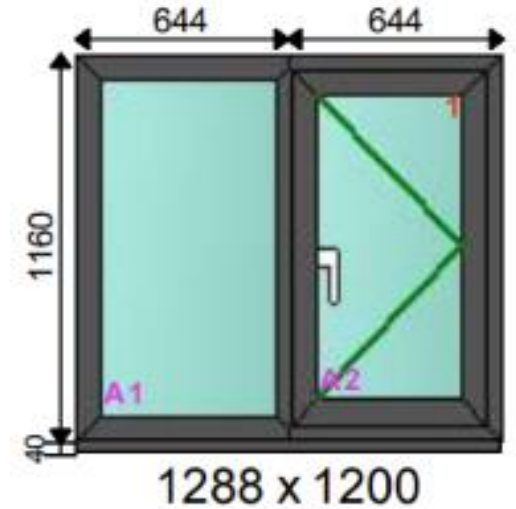
Wall U Values

Comparable to 125/150mm masonry cavities



Psi Values

Small number of industry calculations

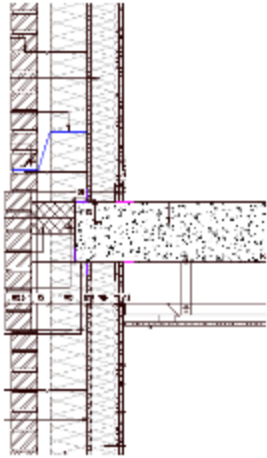


Windows

Double glazing works. Triple gives comfort

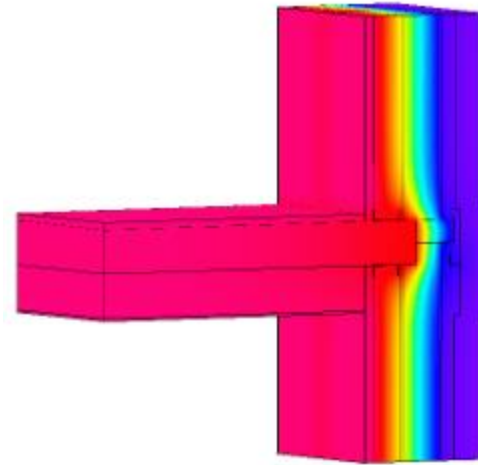
- **Air testing targets are slightly more relaxed**
- **Block compliance no longer permitted on terraced housing**
- **More detailed information to be provided earlier to energy assessors**

HRB Construction



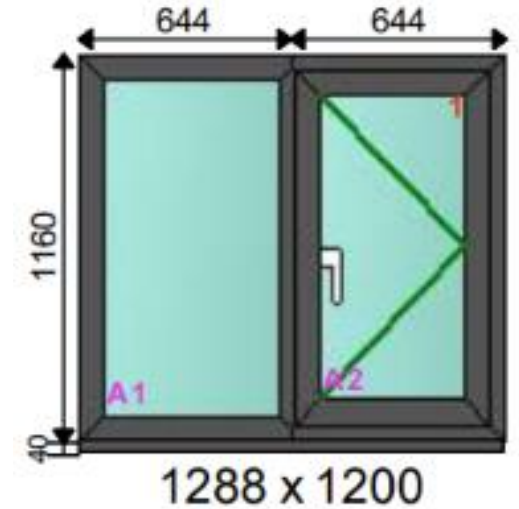
Wall U Values

GLA policy drives higher performance



Psi Values

Bespoke details.
Early engineering input recommended

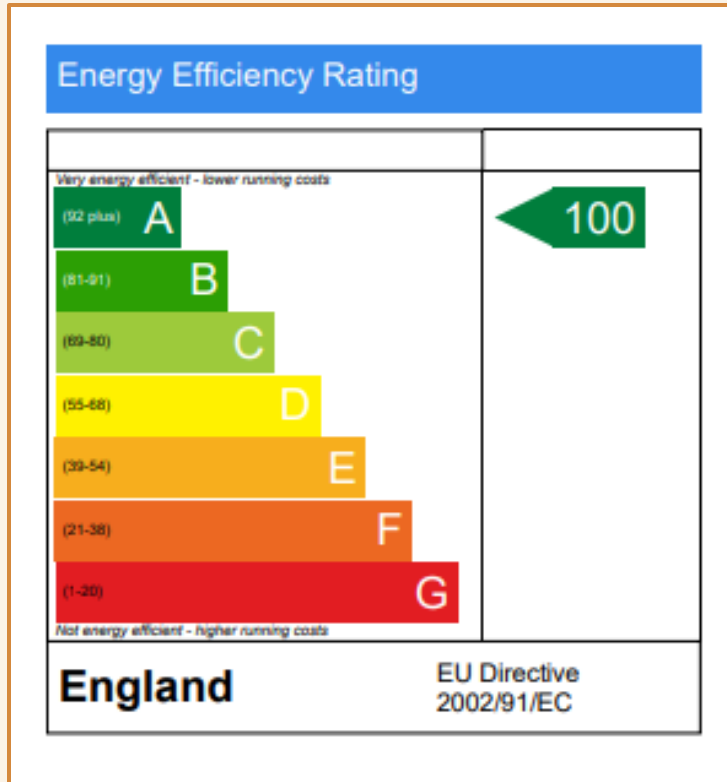


Windows

Triple glazing likely to be needed

- **Air testing targets are slightly more relaxed**
- **Block compliance still permitted for flat blocks**
- **More detailed information to be provided earlier to energy assessors**
- **A fuller, more accurate suite of design information at early RIBA stages crucial - psi values / concrete columns**

EPC ratings

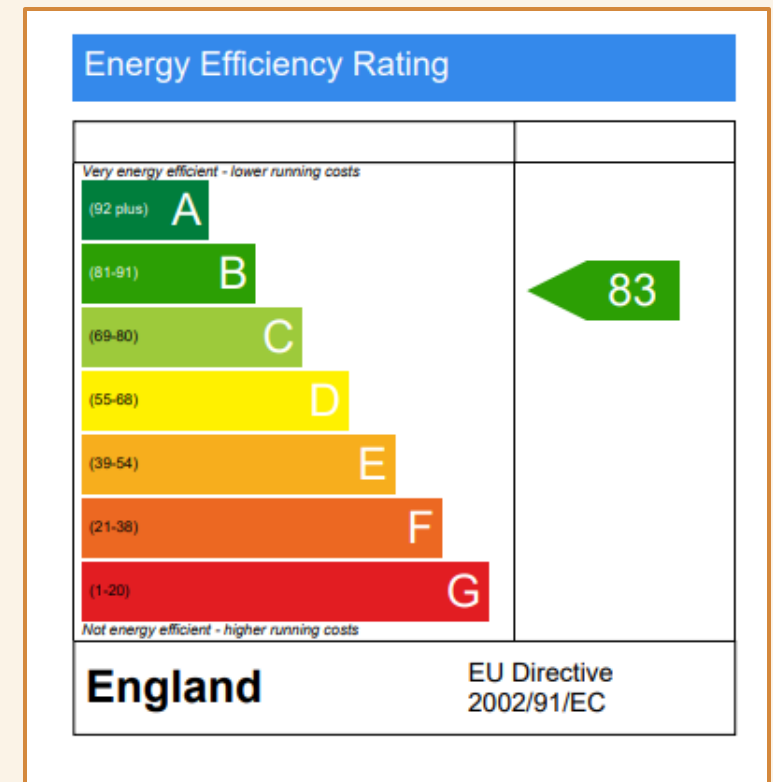


Houses

- Net Zero regulated energy
- EPC A as standard
- EPC score 100+ with battery storage

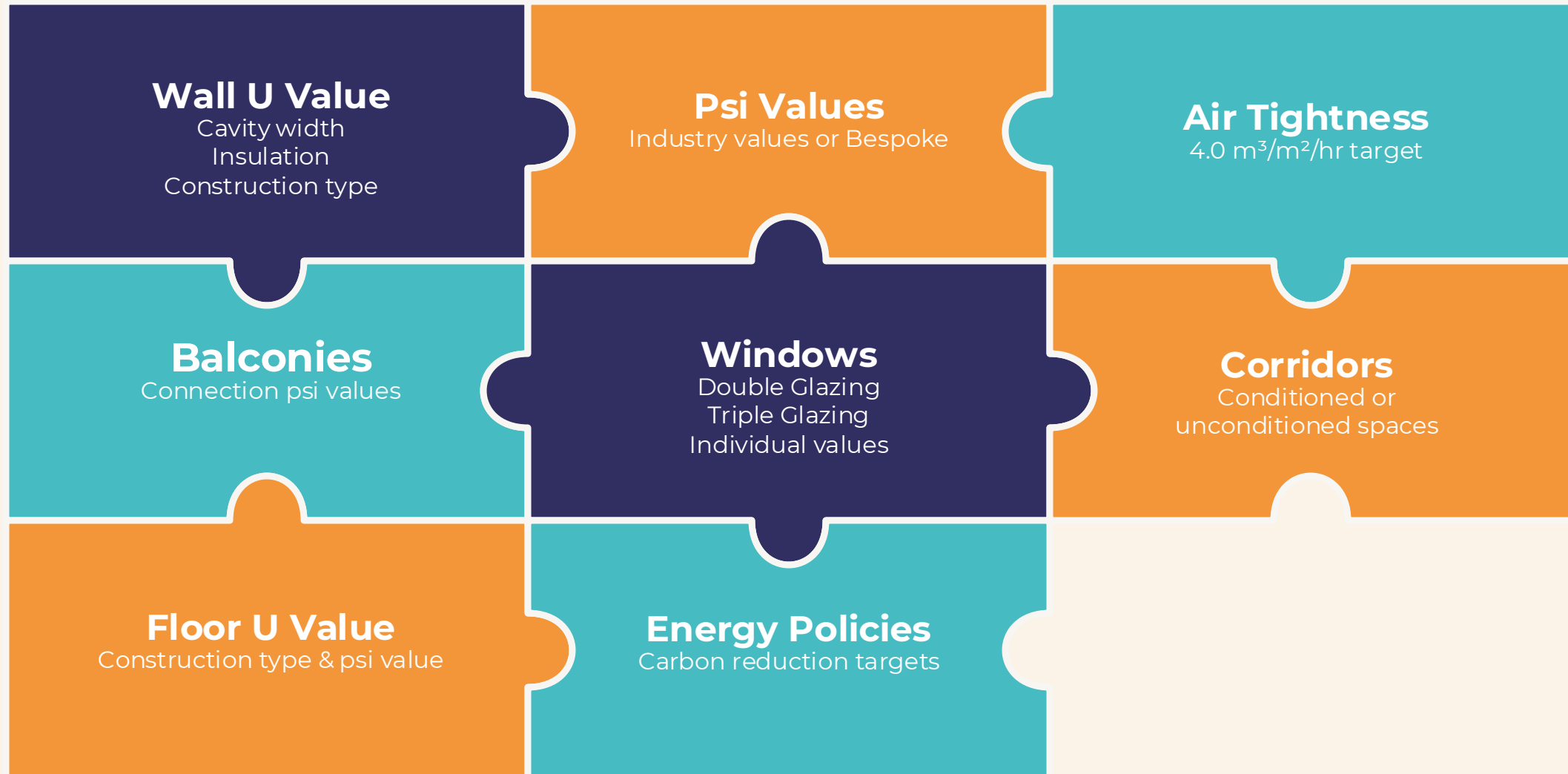
Flats

- EPC B as standard
- Some flats EPC C



PV connection directly to the unit remains the key differentiator in EPC score

How Requirements Interlock



Work with multiple parts simultaneously for the most efficient design and to avoid fabric creep and rising costs



Future Homes Standard Essentials

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Fabric first and reactions to SAP 10.3

Alex Naraian
Group Head of Technical
Churchill Living Ltd

Delivering Fabric-First Homes Under the Future Homes Standard



Innovative building approaches
for sustainable living


Churchill
Living
Your lifestyle • Your choice

Churchill's Fabric-First Strategy and Early Regulatory Response



Why Churchill Went Beyond Part L 2021 Requirements



Proactive Regulatory Compliance

Churchill exceeded Part L 2021 to anticipate future building regulation changes and reduce design rework.

Enhanced Fabric Performance

Improvements included wider masonry cavities, triple-glazed windows, tighter airtightness, and thicker roof insulation.

Integrated Energy Solutions

Increased photovoltaic capacity supported carbon compliance while electric heating ensured simplicity and reliability.

Commercial and Strategic Benefits

Early action reduced hidden costs, coordination challenges, and delivery risks from future regulatory updates.

Emerging Future Homes Standard Pressures on Fabric and Systems



Fabric-First Approach Challenges

Strong fabric-first methods remain crucial but alone do not ensure compliance with Future Homes Standard.

Targeted Fabric Improvements

Upgrading sloped warm roofs and improving airtightness, especially around dormers, are critical detailed optimisations.

Low-Carbon Hot Water Systems

Introduction of air source heat pump hot water cylinders supports low-carbon compliance without major space heating changes.

Layered Compliance Strategies

Combining fabric upgrades, airtightness, and advanced systems enables compliance with cost and build complexity considerations.

Linear Thermal Transmittance (U) and Temperature Factor (T_{int}) Report

Client	Churchill Retirement Living	Reference	R3330
Project	Thermal Bridge Calculation	Revision	1
Author	Robert Lillrup	Date	02/08/2024
Detail Description	BT	Drawing Ref.	CCC00045
Construction Type	BT	Therm. F.R.	Medium
Construction	Masonry Wall w/ 100 mm G204 Insulation, 100 mm 110 Block, 25 mm W0 G102 PIR, Cavity Thermally Broken Liner		
Detail Drawings		Temperature Distribution Report	
Calculation Results			
Linear Thermal Transmittance (U-value) (W/m ² K)		0.0164	
Temperature Factor		0.87	
Notes	Cavity: Remains Unperforated		
Risk of Surface Condensation or Moist Growth*			
Most growth buildings with absorbent internal surfaces - Critical Temperature Factor (T _{int})		0.75	Pass
Dwellings: residential buildings, schools		0.75	Pass
Swimming pools (excluding a dwelling with an indoor pool)		0.90	N/A
Surface condensation: buildings with non-absorbent internal surfaces - Critical Temperature Factor (T _{int})		0.80	N/A
Storage buildings		0.80	N/A
Offices, retail premises		0.80	N/A
Sports halls, schools, care homes, buildings with un-flued gas heaters		0.80	N/A
Buildings with high humidity, e.g. swimming pools, laundries, breweries		0.90	N/A

* The risk of surface condensation or mould growth assessment follows the criteria in BS6263:2015 Appendix A.1.1.1. Assessing the effect of internal lighting at junctions and around openings.





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Fabric first and reactions to SAP 10.3



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Churchill Living Ltd



Future Homes Standard Technical Conference



Powering up



Dan Neasham
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Nigel Banks
Technical Director -
Zero Bills & Low
Carbon Homes
Octopus Energy



Swetta Coopmah
Head of Smart
Energy Systems
BEAMA



Neil Madgwick
Head of Connections
Service Delivery
UK Power Networks



Dan Nicholls
Chief Product Officer
SNRG



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Powering up

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Head of Sustainability and Performance

Future Homes Hub

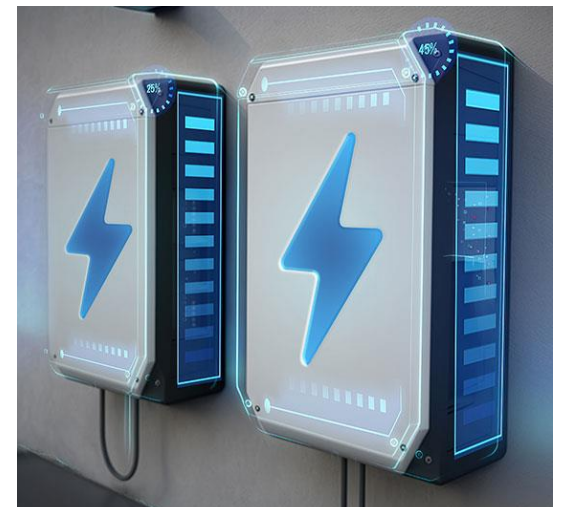


The Future Homes Standard Essentials

Seven actions to de-risk delivery today



New homes bring new electrical demands



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



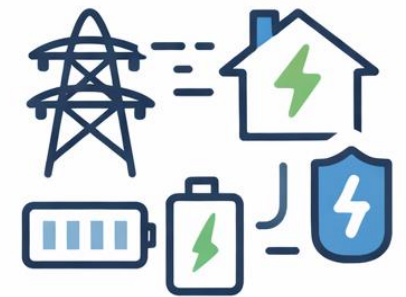
Avoid over or under-assessing the electrical demand

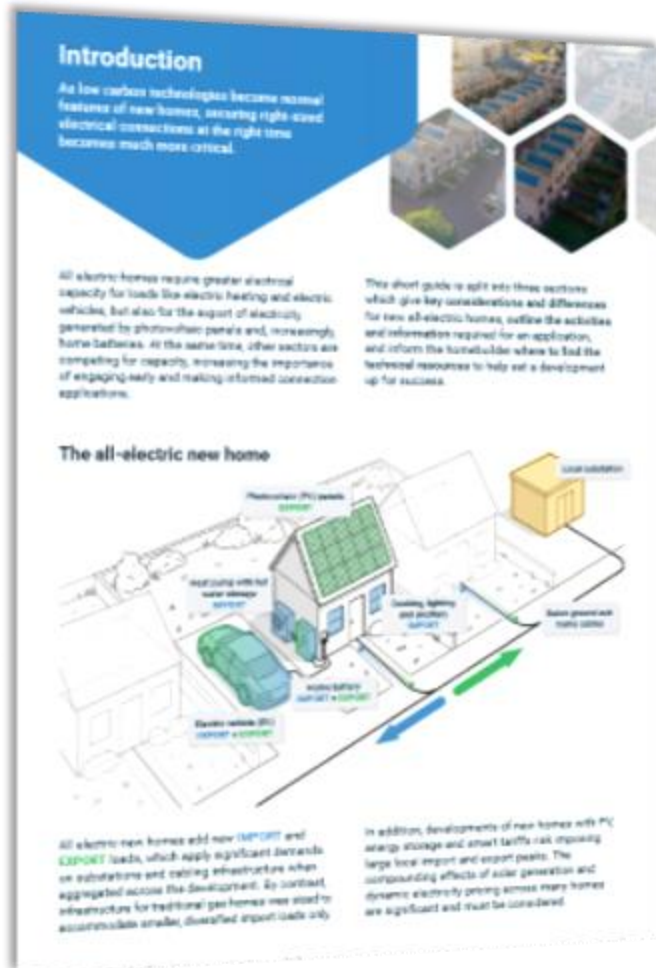


Develop the electrical design with network operator input



Remember: Mitigations to connection constraints exist





- 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

Updated: 01-Jun

WORKING DOCUMENT

In Blue - Items added/updated since last issue

Appendix A - FHS ISSUES LOG

Issue ID	Issue Title, Description & Comments	Subject	Grouping	Importance	Urgency	Rating (xU)	Status	Current Action by	Team to action	Suggested Actions	Relevant Doc	Section
4	<p>Guidance for consistency of interpretation of PV 'Max-fit' requirements</p> <p>Related Items: #10, #11, #12, #13, #15, #16</p> <p>"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"</p>	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	<p>Guidance on roof vent acceptable and unacceptable locations</p> <ul style="list-style-type: none"> - length of ductwork may increase if relocate to make way for PV panels. What implications does this have for ventilation system design? - potentially could be quite a few vents, especially if using purge vents for Part O compliance and/or internal downpipes - 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	<p>Definition of 'electricity is available to residents' in the context of PV on flats</p> <p>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?</p> <p>"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"</p>	PV	PV5 - For apartments	1.0	1	1	1	FHH	PV D&CPG	<ul style="list-style-type: none"> - FHH to develop/collate list of contender examples - Homebuilders to provide supporting evidence - Future Homes Hub to set up FHS Apartments' Group at which this can be discussed 	Part L	Para 5.75
1	<p>Definition of the "curtilage of the building" in the context of Requirement L3</p> <p>What is the definition of "curtilage of the building"? This is not a defined term in Part L. Requirement L3: "... within the boundaries of the curtilage of the building".</p>	PV	PV6 - General	1.0	1	1	1	MHCLG	MHCLG	Clarification sought from MHCLG	Part L	Requirement L3 & Para 5.70 & 5.71
1	<p>Required PV calculation in the context of a detached garage roof</p> <ul style="list-style-type: none"> - confirmation detached garage is excluded in area for 40% requirement (as current SAP10 conventions)? - 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	MHCLG	MHCLG	Clarification sought from MHCLG	Part L	



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Powering up

Nigel Banks

Technical Director – Zero Bills & Low Carbon Homes

Octopus Energy

Powering Up: *The electricity supplier's perspective*

Nigel Banks

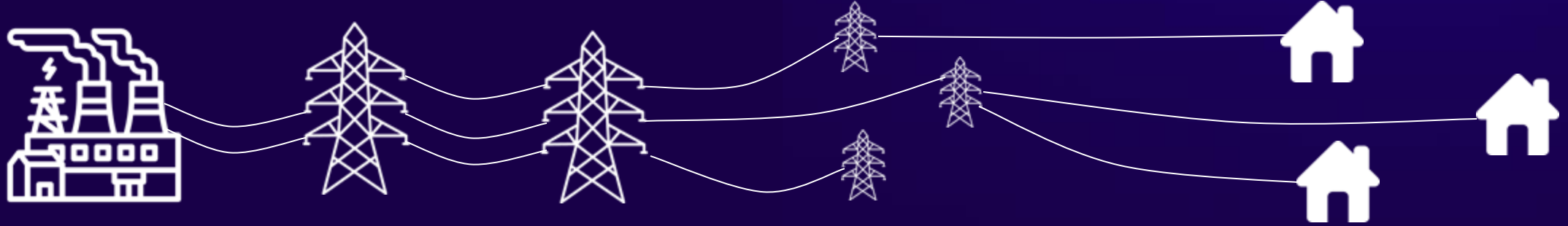
Technical Director, Octopus Energy

octopusenergy



The energy landscape is shifting – from static to decentralised

Before

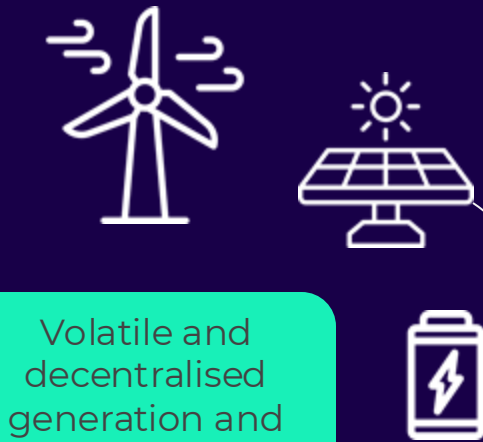


Dispatchable fossil fuel generation

Linear transmission and distribution

Static consumption by the end consumer

Now



Volatile and decentralised generation and storage

Optimised system operations & network energy flows



Unlock flexible, dispatchable home demand

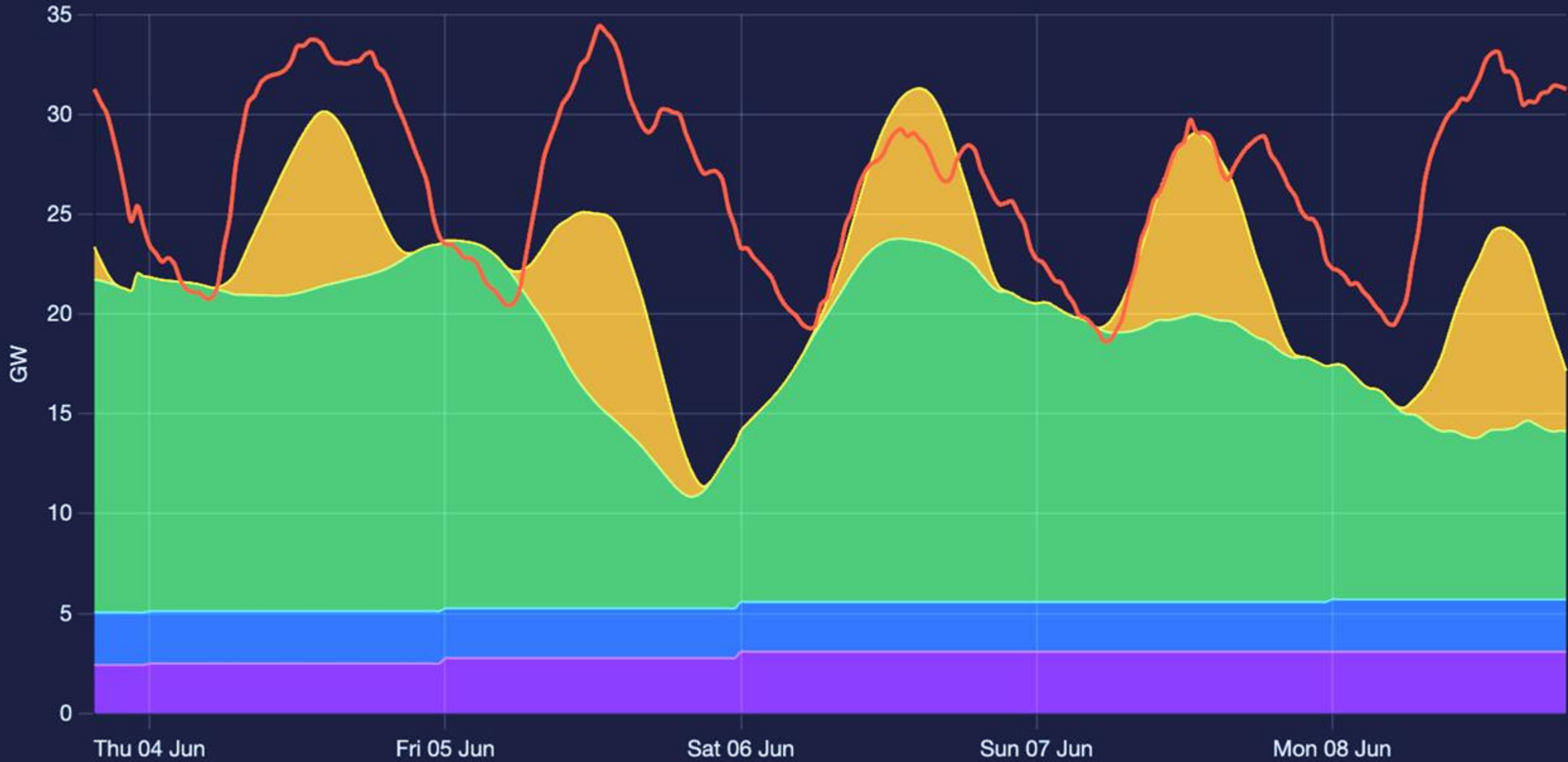


Offer customers **next-generation tariffs** & energy products

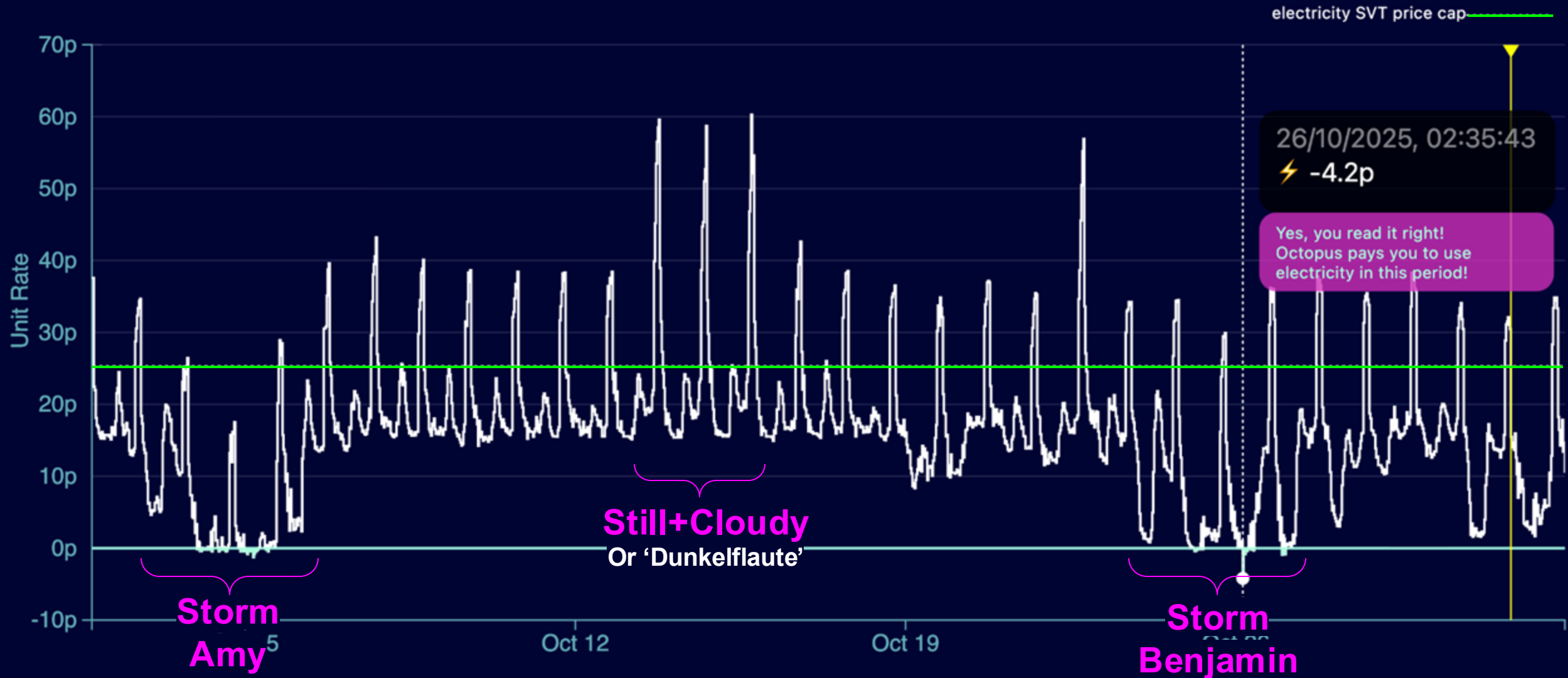


Generation forecast

— Demand — Solar — Wind — Biomass — Nuclear



How the price of electricity changed through October 2025





Agile Octopus

Perfect for anyone who can shift their electricity use outside of peak times



Octopus Tracker

Britain's first tariff to truly follow the wholesale price of energy



Octopus Go

No Intelligent-compatible car or charger? Get four hours of cheap electricity a night for your home and car.



Octopus Outgoing

Check out our fixed and agile tariffs perfect for exporting energy to the grid.



octopus FAN CLUB



Octopus Flux

An import and export tariff giving you the best rates for consuming and selling your energy.



Snug Octopus

The Intelligent tariff for storage heaters. We charge your storage heaters at the cheapest and greenest times of the day, whilst supporting the grid.



Intelligent Octopus Go for electric cars

Super cheap EV smart charging and six hours of cheap home electricity a night



Cosy Octopus

The smart electricity tariff designed to keep heat-pump homes toasty and energy bills cheaper.



Shape Shifters: Trio

Unlock 21 hours of cheaper electricity - every single day

Join hundreds of businesses making big savings with Trio.



ZERO BILLS

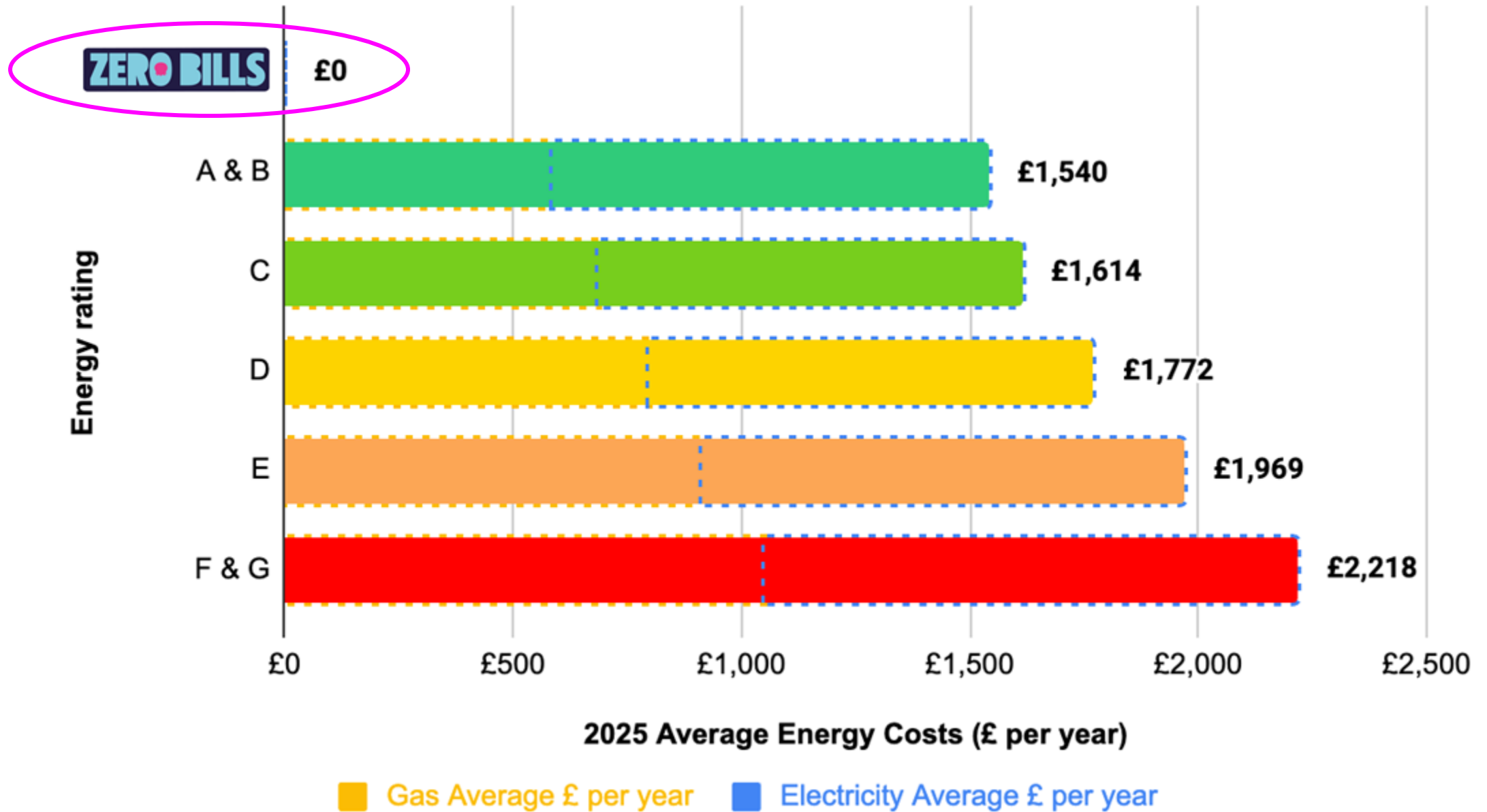
PAY NOTHING FOR 5 YEARS octopusenergy



POWERPACK



Unlocking bills savings well beyond “EPC A” rated homes



Zero Bills: Example Installation:



+ Solar PV



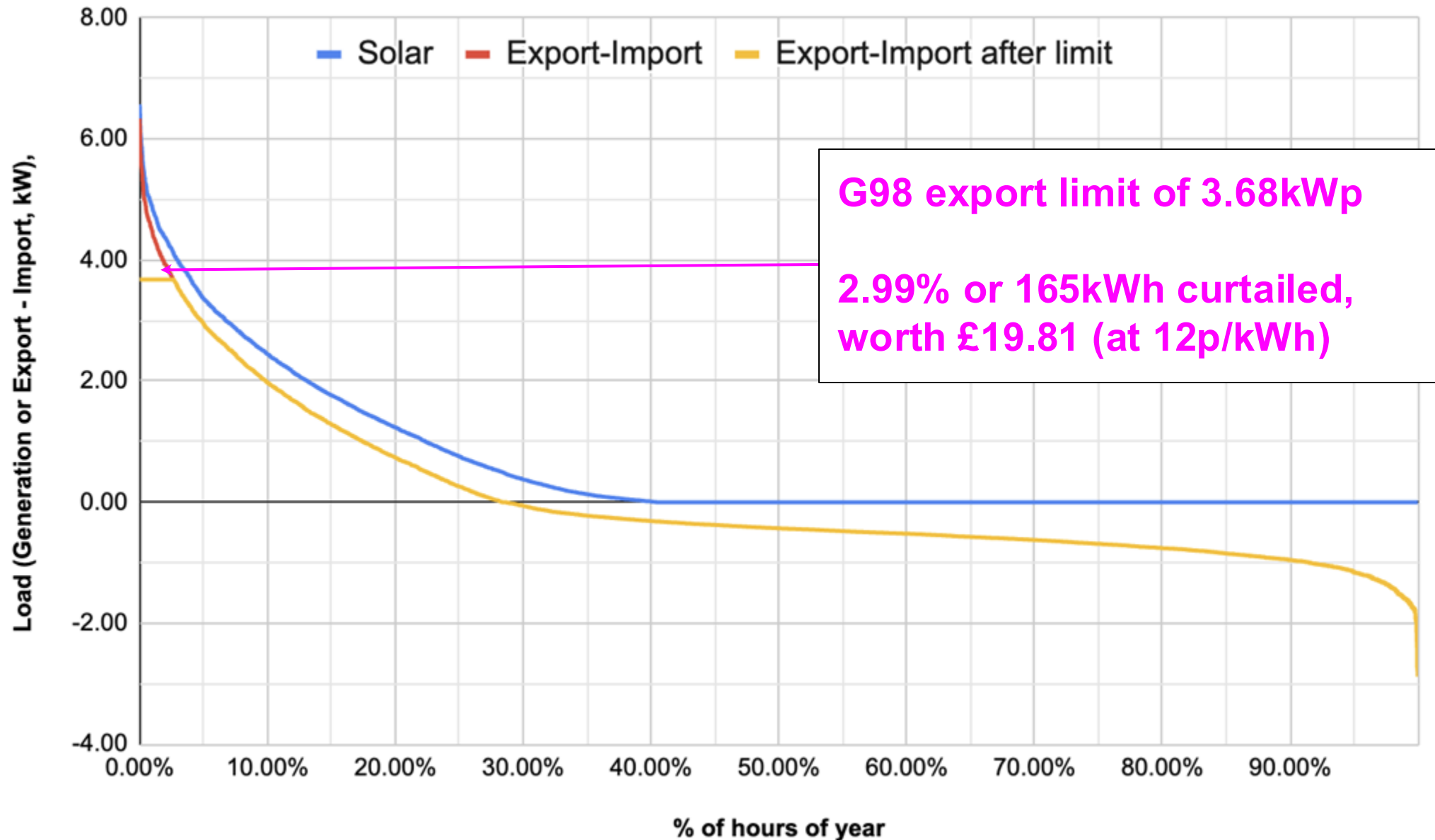
+ Home Battery

+ EV charger

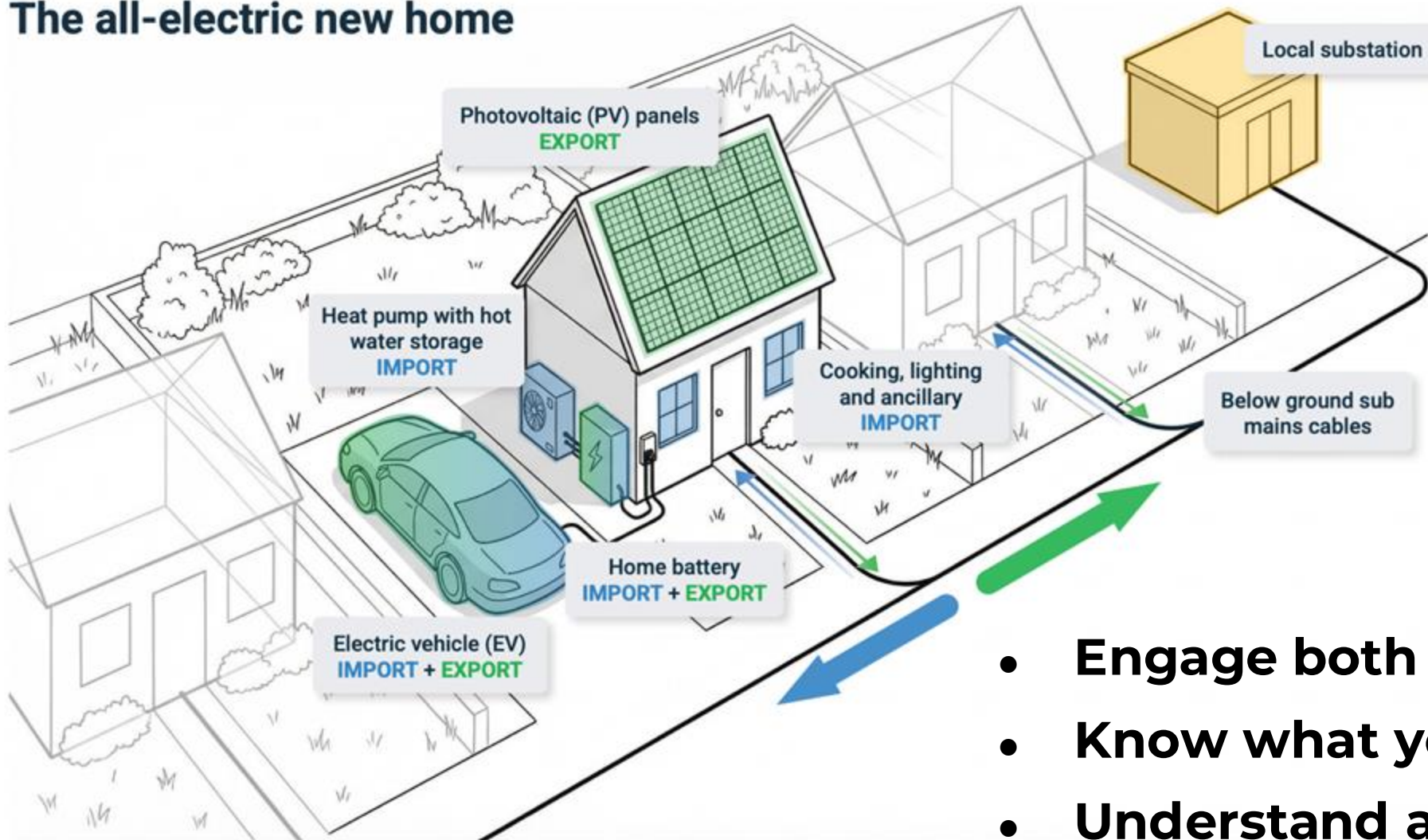


+ Heat Pump!

Semi-D house, 10kWp solar (split N&S), Leeds 2017 solar profile, new build spec, ASHP, No EV load profile (averaged), No BESS



FHH Guidance on Grid connections for The all-electric new home



- Engage both DNO & iDNOs early
- Know what you are asking for
- Understand any constraints
- Mitigations exist & can be implemented with enough time



LOVE &
POWER



nigel.banks@octoenergy.com
07837 516349



Future Homes Standard Technical Conference

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Powering up

Dan Nicholls
Chief Product Officer
SNRG



Future Homes Standard Technical Conference



Powering up



Dan Neasham
Head of Sustainability
and Performance
Future Homes Hub



Nigel Banks
Technical Director -
Zero Bills & Low
Carbon Homes
Octopus Energy



Swetta Coopmah
Head of Smart
Energy Systems
BEAMA



Neil Madgwick
Head of Connections
Service Delivery
UK Power Networks



Dan Nicholls
Chief Product Officer
SNRG



Future Homes Standard Technical Conference



Drinks Reception 5-6pm

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Be sure to share your experience on LinkedIn using #FHSReady



Future Homes Standard Technical Conference



LUNCH BREAK

Coming up next...
Fresh thinking on ventilation & IAQ



Be sure to share your experience on LinkedIn using #FHSReady



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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

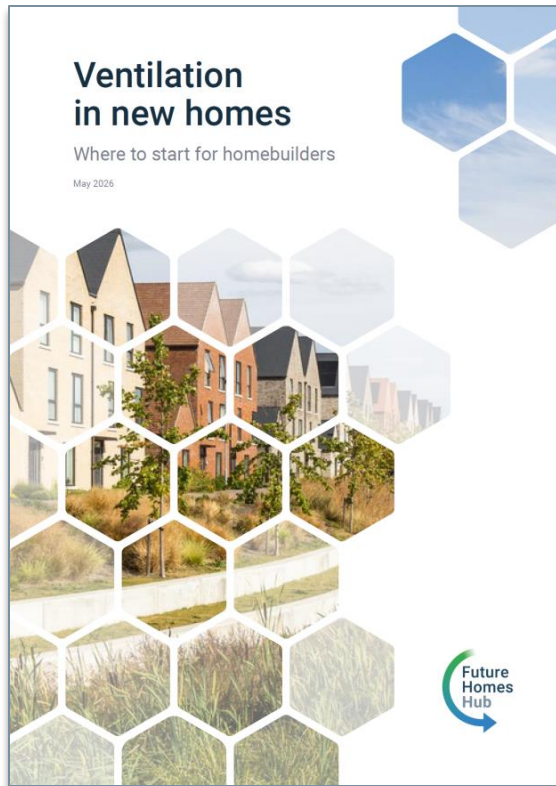
Ventilation as a critical building service

FHS Ready Essentials to de-risk delivery today



Ventilation 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



- 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



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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

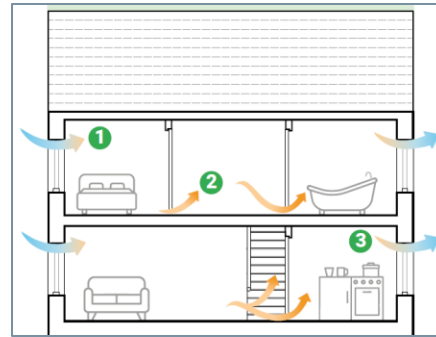
- Same as structure, fire safety, fabric & heating systems
- Considered alongside airtightness strategy
- A challenge across the entire delivery process



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.

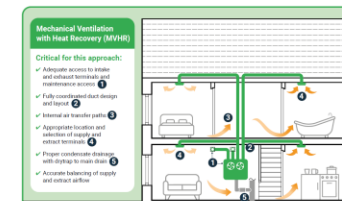
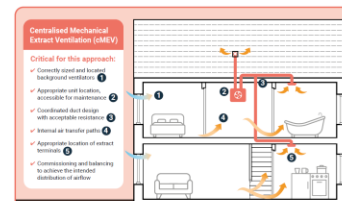
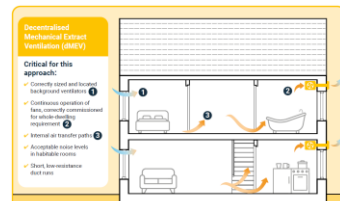
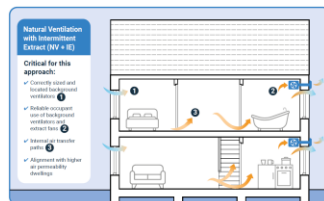
Value of verification & learning from homes in use



- **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





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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



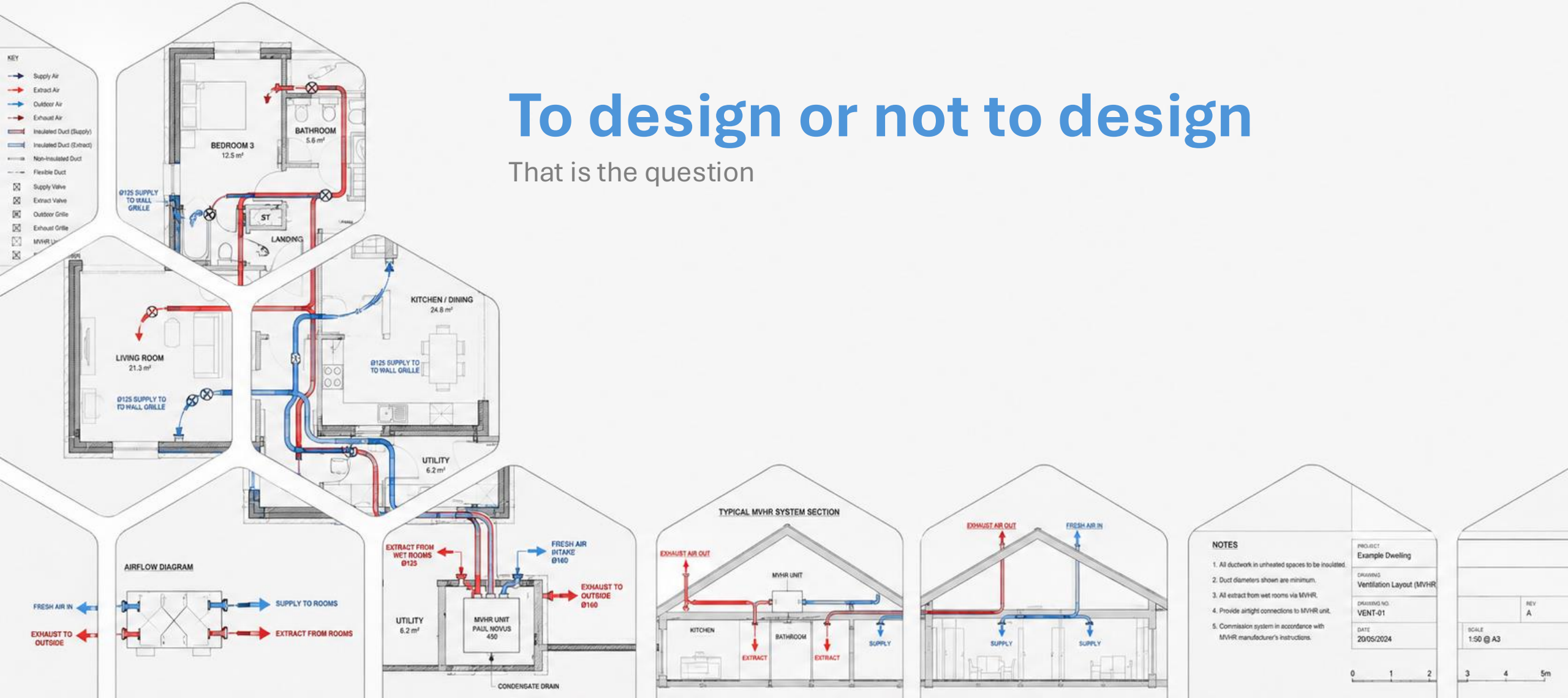
The Wet Fish Conundrum

Why knowledge alone doesn't always deliver competence onsite



To design or not to design

That is the question



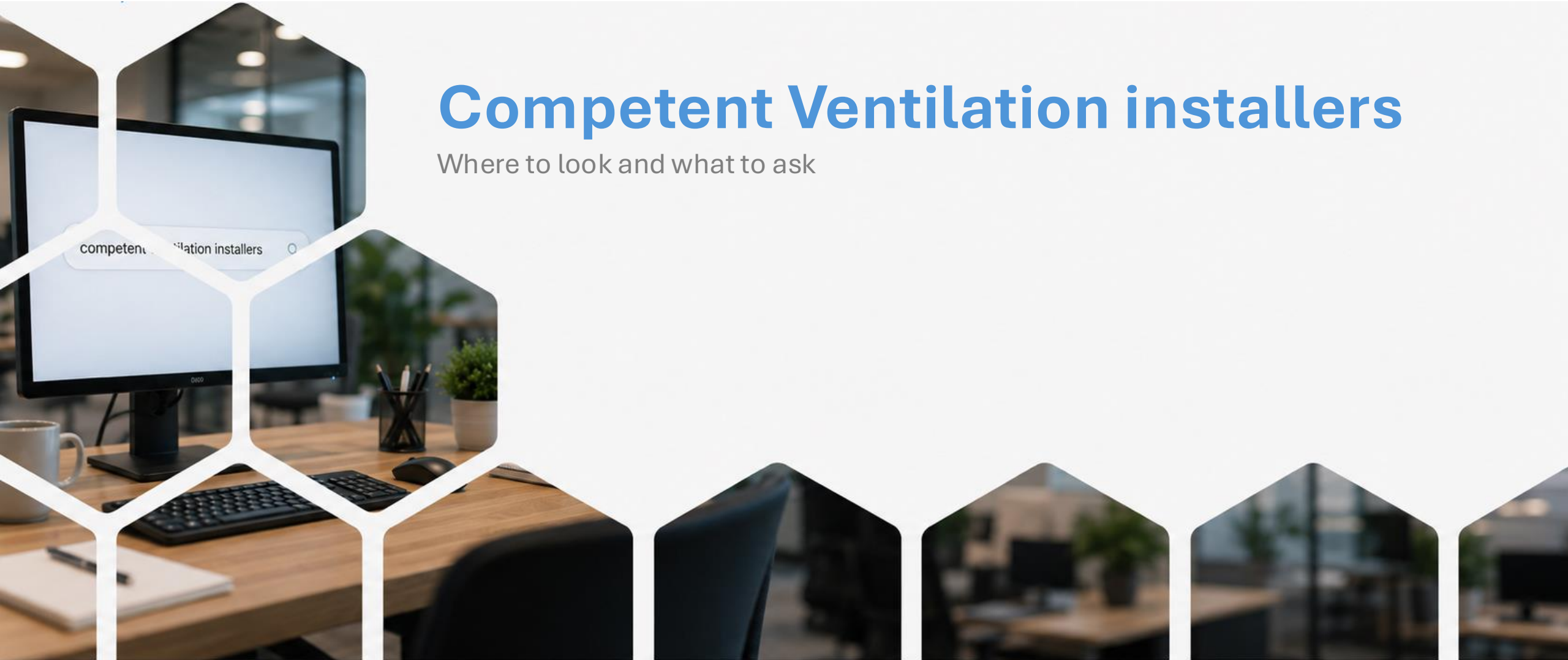
Collaborate to Ventilate

(World Ventil8 Day theme 2025)



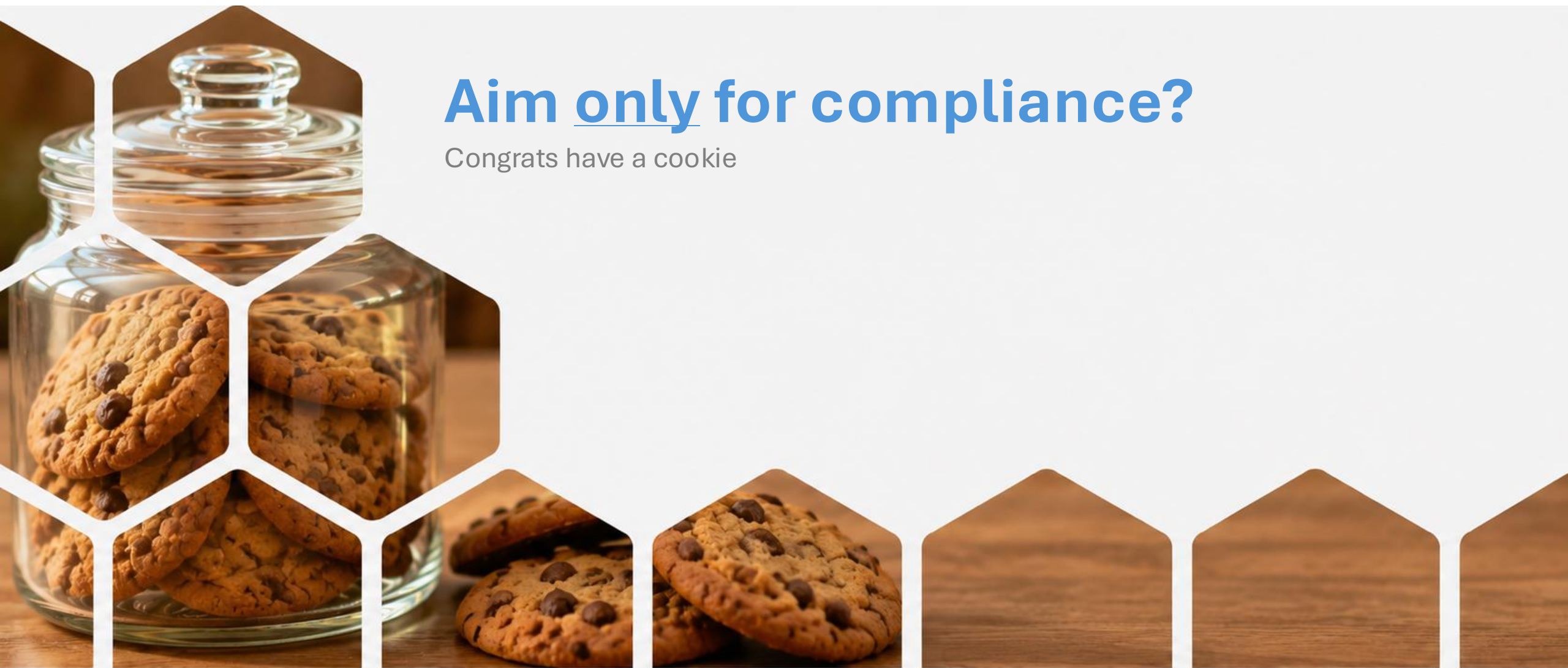
Competent Ventilation installers

Where to look and what to ask

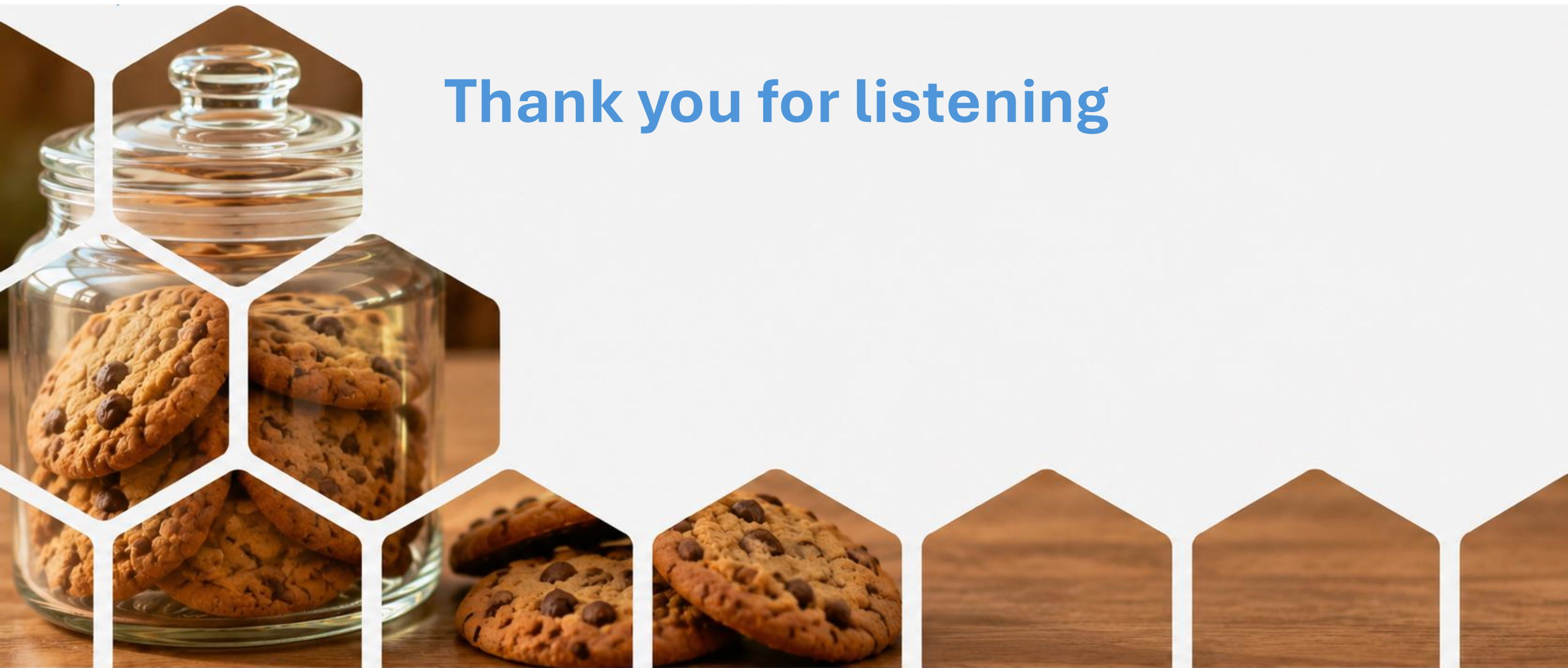


Aim only for compliance?

Congrats have a cookie



Thank you for listening





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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

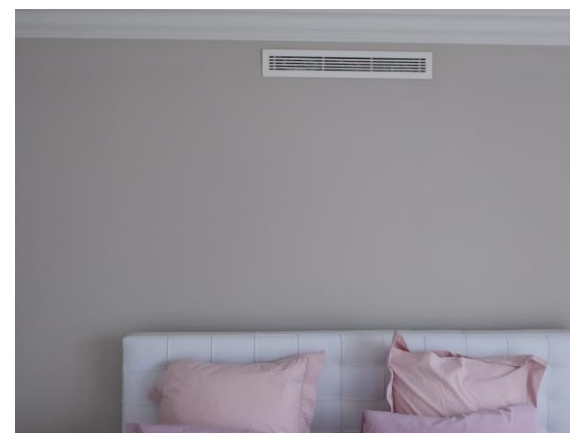
Testing and commissioning

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.

This 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.

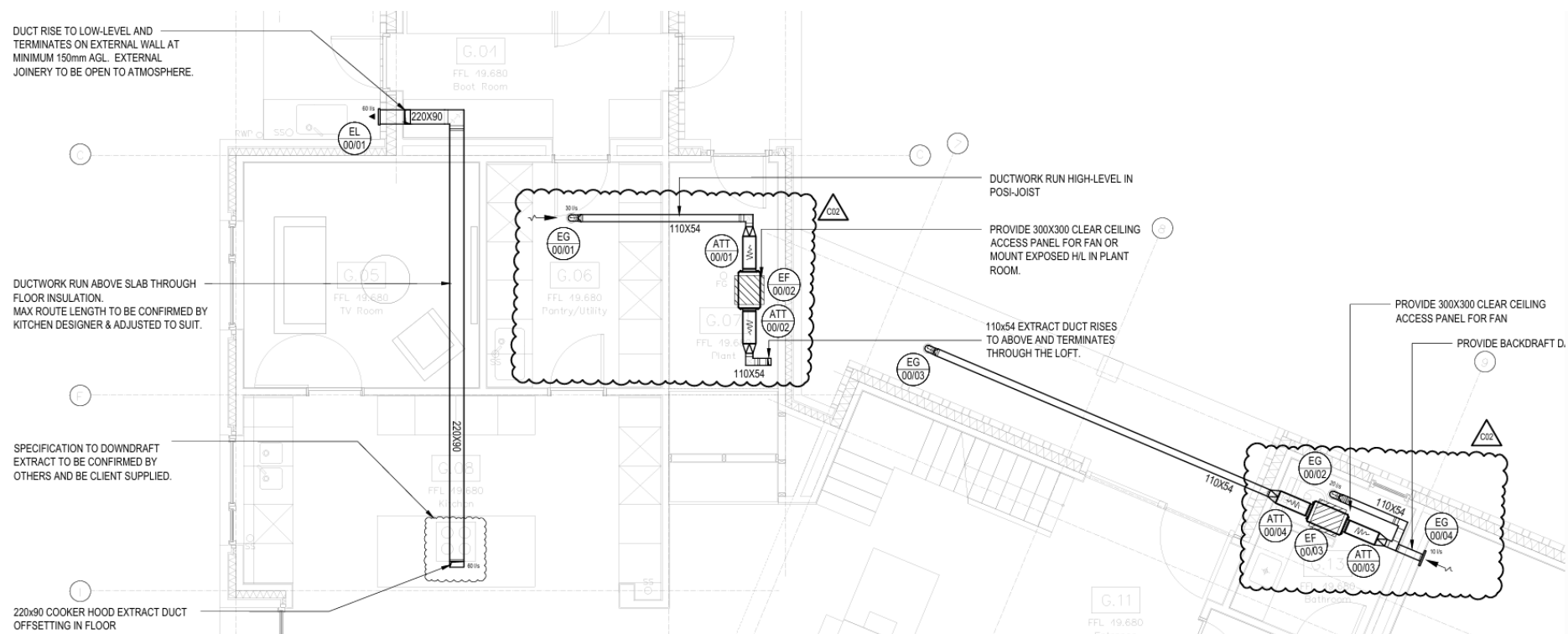
Value Engineering – ‘It’ll do the flow rate....’

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.

<u>Dwelling Details</u>				
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
<u>Extract Normal Speed</u>		<u>Extract Boost Speed</u>		
Kitchen	11	Kitchen	13	
WC	10	WC	10	
Bathroom	11	Bathroom	11	
Ensuite	11	Ensuite	11	
Total Airflow	43l/s	Total Airflow	45l/s	

The design

Provided by the fan manufacturer

Air flow rates met Building Regulations

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 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.



Future Homes Standard Technical Conference



Fresh thinking on ventilation & IAQ



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Head of Homes and
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Future Homes Hub



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Churchill Living Ltd



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Managing Director
Farmwood



Future Homes Standard Technical Conference



Feeling the heat: part 2



Dan Neasham
Head of Sustainability
and Performance
Future Homes Hub



Dr Jaydeep Bhadra
Domestic Sector
Technical Manager
CIBSE



Max Becker
Head of MEP
Wates



Adam Tckaz
Business
Development Director
- Sustainable Heat
GTC



Firat Ucer
Regional Sales
Manager
NIBE



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Feeling the heat: part 2

Dan Neasham

Head of Sustainability and Performance

Future Homes Hub



The Future Homes Standard Essentials

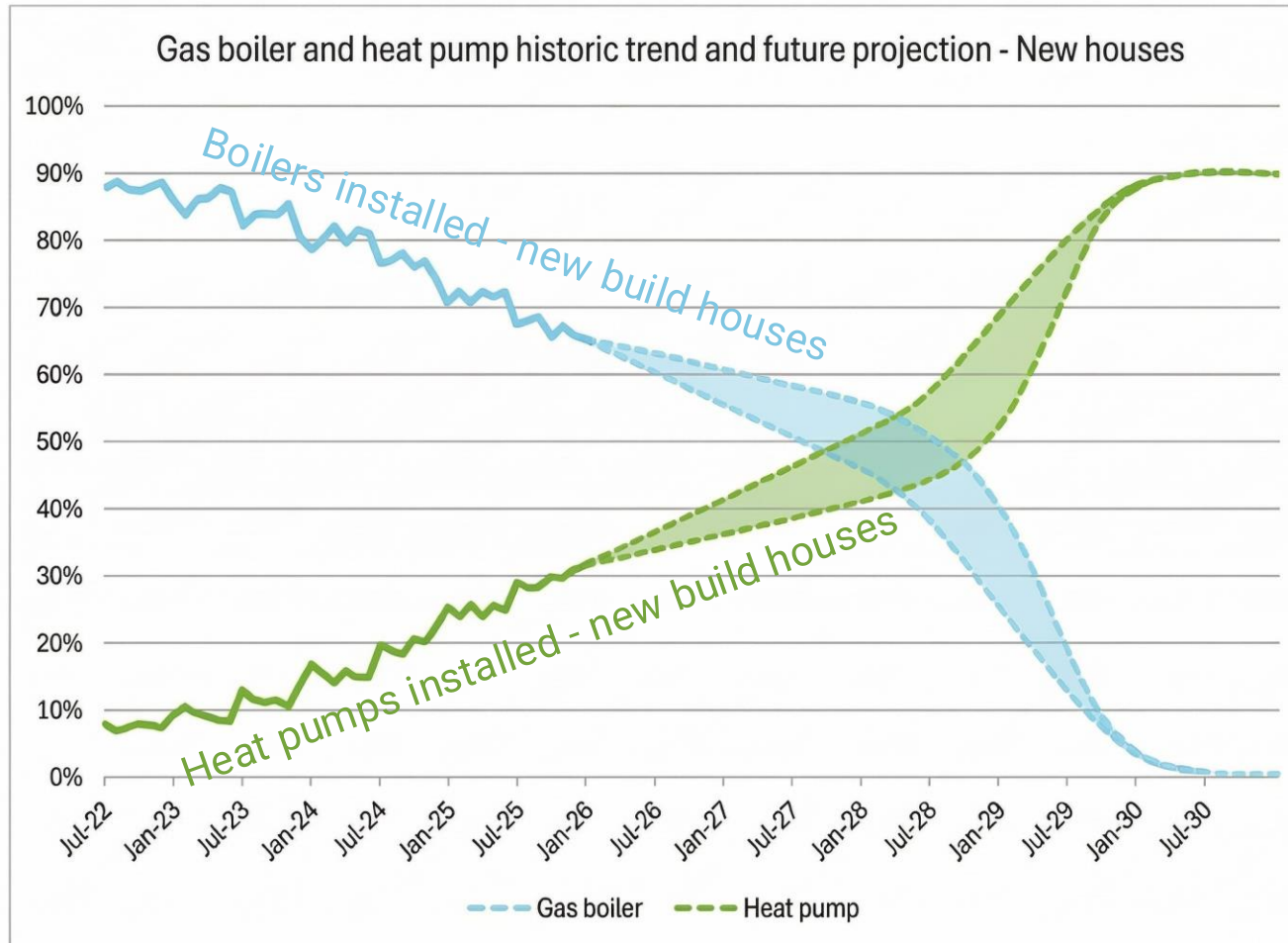
Seven actions to de-risk delivery today



Future Homes Standard means no fossil fuel heating*



The sector is already scaling up...



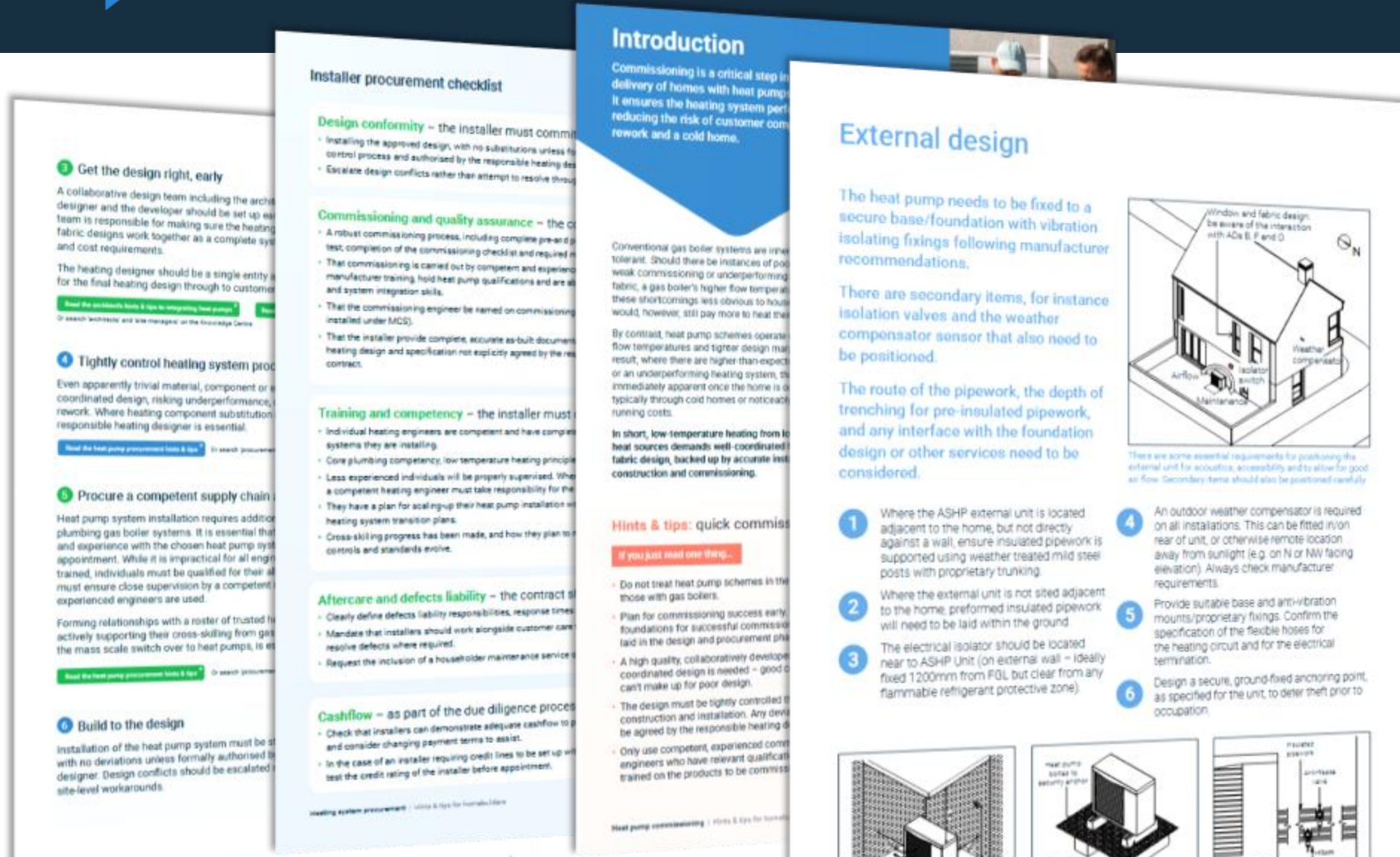
... but we must **de-risk** delivery in advance of adoption of low carbon heating at scale under FHS

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



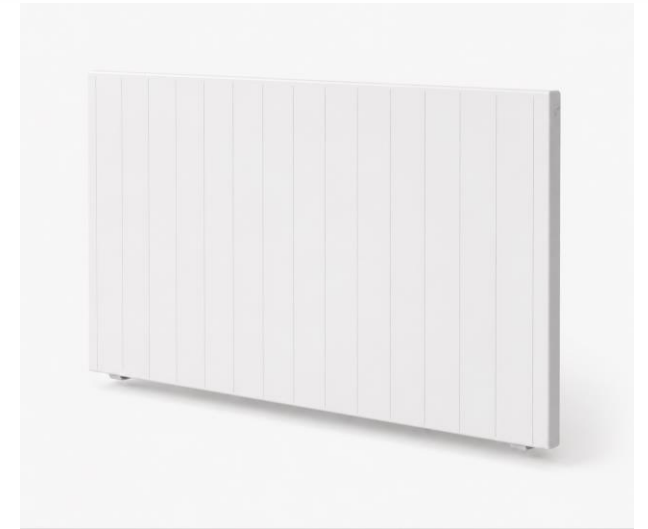
Including:

- 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



Heat networks:

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





Facilitating resolution of FHS issues - Hub process

Updated: 01-Jun

WORKING DOCUMENT

In Blue - Items added/updated since last issue

Appendix A - FHS ISSUES LOG

Issue ID	Issue Title, Description & Comments	Subject	Grouping	Importance	Urgency	Rating (xU)	Status	Current Action by	Team to action	Suggested Actions	Relevant Doc	Section
4	<p>Guidance for consistency of interpretation of PV 'Max-fit' requirements</p> <p>Related items: #10, #11, #12, #13, #15, #16</p> <p>"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"</p>	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	<p>Guidance on roof vent acceptable and unacceptable locations</p> <ul style="list-style-type: none"> - length of ductwork may increase if relocate to make way for PV panels. What implications does this have for ventilation system design? - potentially could be quite a few vents, especially if using purge vents for Part O compliance and/or internal downpipes - 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	<p>Definition of 'electricity is available to residents' in the context of PV on flats</p> <p>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?</p> <p>"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"</p>	PV	PV5 - For apartments	1.0	1	1	1	FHH	PV D&CPG	<ul style="list-style-type: none"> - FHH to develop/collate list of contender examples - Homebuilders to provide supporting evidence - Future Homes Hub to set up FHS Apartments' Group at which this can be discussed 	Part L	Para 5.75
1	<p>Definition of the "curtilage of the building" in the context of Requirement L3</p> <p>What is the definition of "curtilage of the building"? This is not a defined term in Part L. Requirement L3: "... within the boundaries of the curtilage of the building".</p>	PV	PV6 - General	1.0	1	1	1	MHCLG	MHCLG	Clarification sought from MHCLG	Part L	Requirement L3 & Para 5.70 & 5.71
1	<p>Required PV calculation in the context of a detached garage roof</p> <ul style="list-style-type: none"> - confirmation detached garage is excluded in area for 40% requirement (as current SAP10 conventions)? - 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	MHCLG	MHCLG	Clarification sought from MHCLG	Part L	



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Feeling the heat: part 2

Max Becker
Head of MEP

Wates

Wates Residential FHS: The homebuilder's perspective

17 June 2026

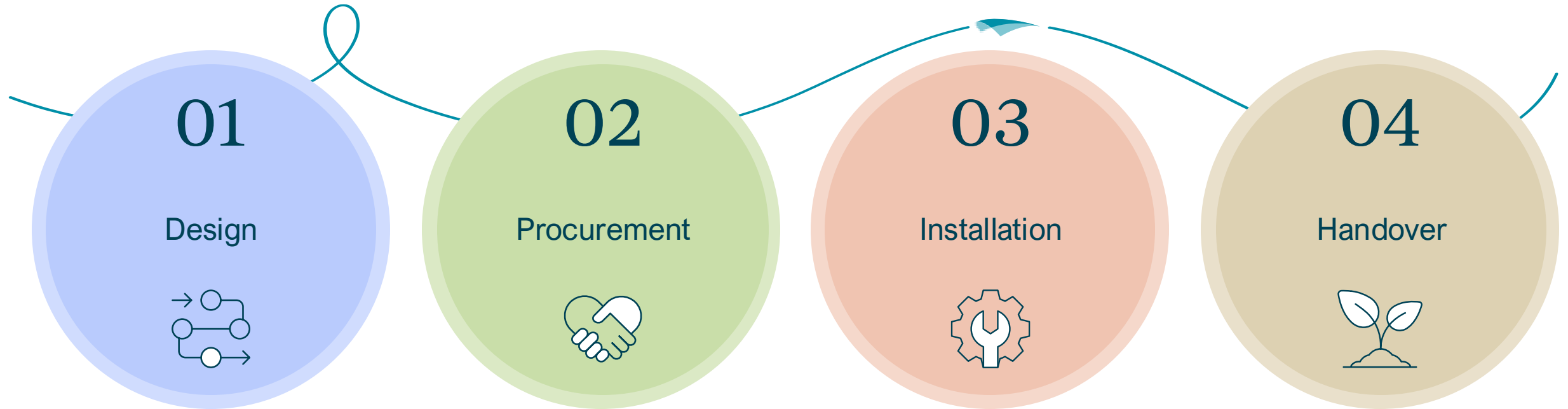
Reimagining places
for people to thrive



Wates
Residential



FHS – Business as Usual



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



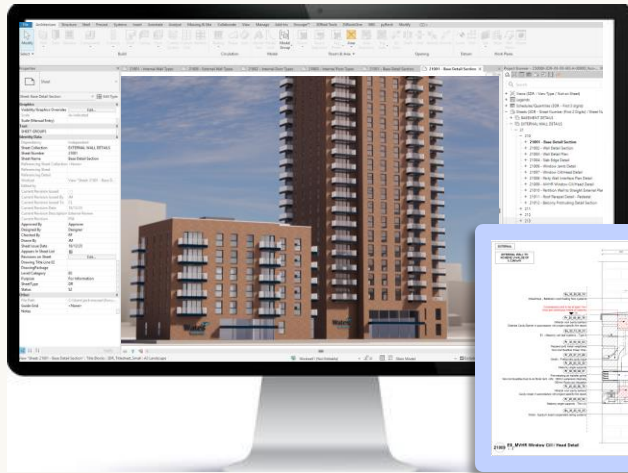
System works & commissioned correctly. Customer turns it off because 'it feels different to a boiler.' Handover is not just paperwork; it's a personalised journey.



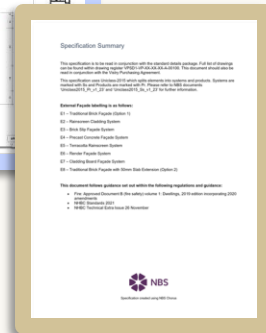
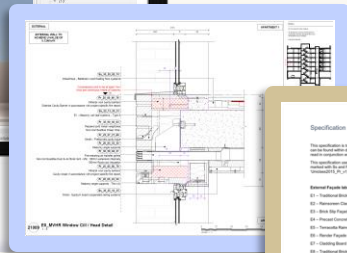
A plan for excellence - Design



Standard House types

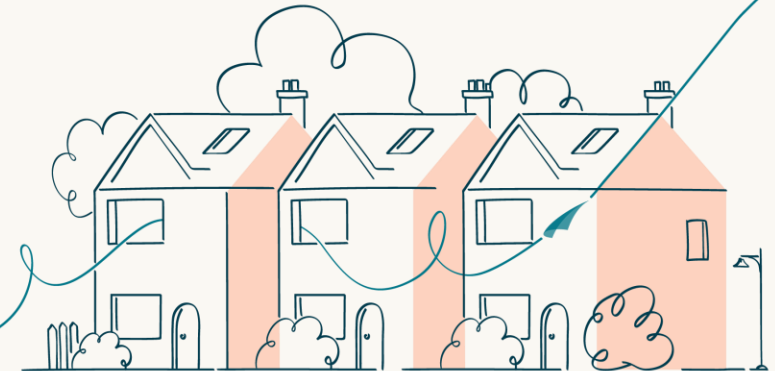


Design Blueprint



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

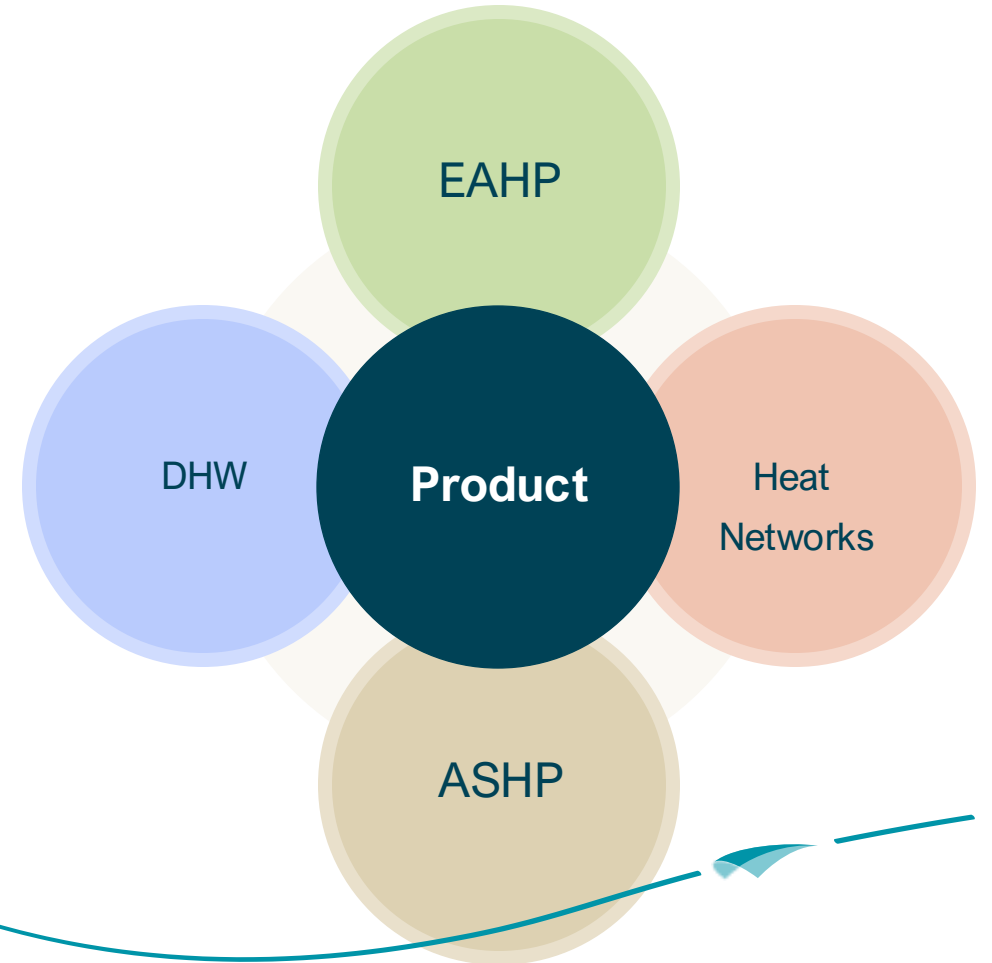
When to select the right product – Inside & outside London, a need for more consistency

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

Thank you



Future Homes Standard Technical Conference



Feeling the heat: part 2

Adam Tckaz

Business Development Director - Sustainable Heat

GTC



THE FUTURE HOMES STANDARD:

Navigating the Transition to Low-Carbon Heat

What it means for housebuilders – From policy to practical delivery

OUR FHS JOURNEY

2006

- **Zero carbon homes announced** - "all homes to be carbon neutral by 2016".

2006

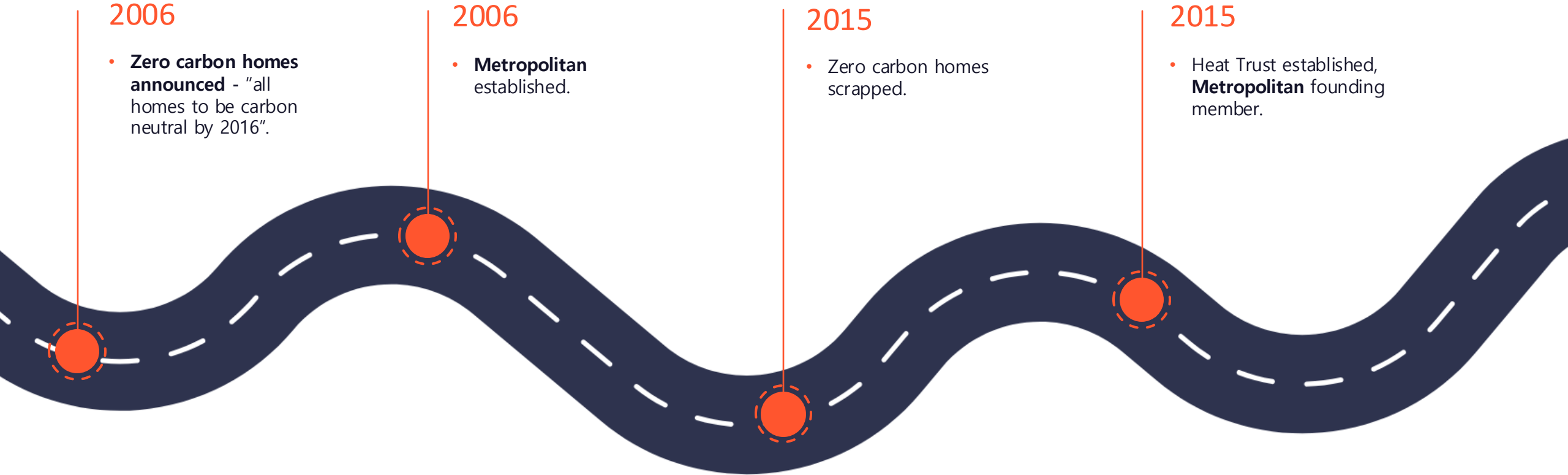
- **Metropolitan** established.

2015

- Zero carbon homes scrapped.

2015

- Heat Trust established, **Metropolitan** founding member.



OUR FHS JOURNEY

2019

- Government commits to Future Home Standard "by 2025".

2019-2026

- GTC & Metropolitan deliver multiple Community Heat Hubs and Networked Ground Source Heat systems – all Future Home Standard Ready.

2026

- **January 2026**
Heat networks regulated by Ofgem.

- **March 2026**
Government announces Future Home Standard including updates to Approved Document Part L – Energy and Greenhouse Gas Emissions.

- **July 2026**
GTC is 30 years old and reaches over 3 million utility connections.

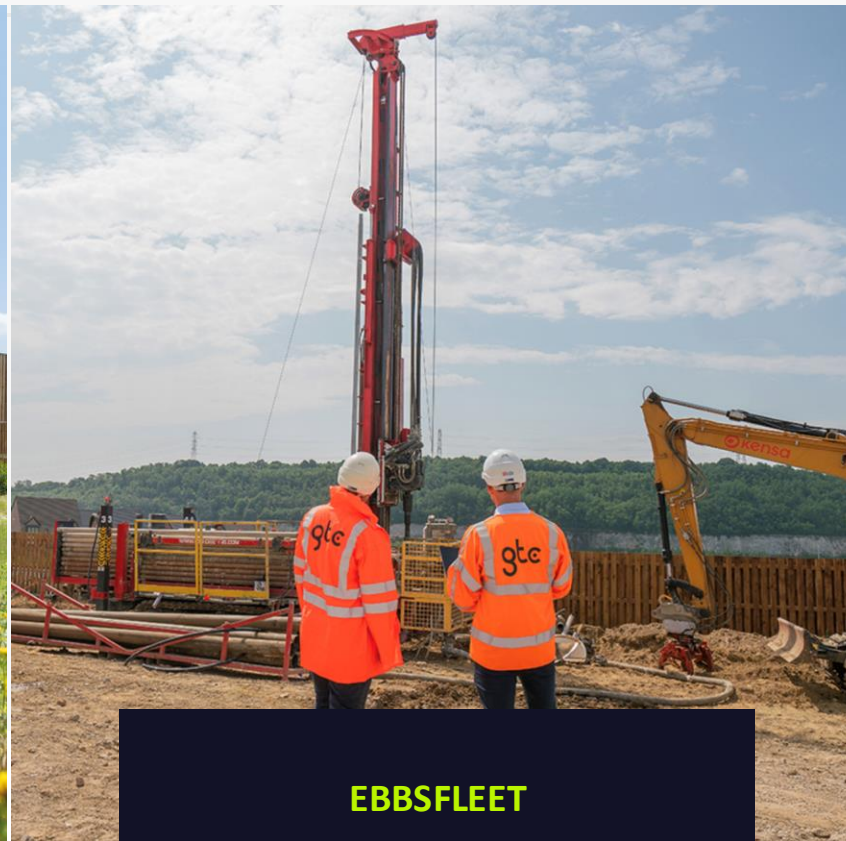


PRE-FUTURE HOMES STANDARD LOW CARBON SITES

We were on site delivering these solutions well in advance of the formal FHS announcement.



CHILTON WOODS



EBBSFLEET



SWINNOW PARK

ASHP REPLACING GAS BOILER?

- High electricity demand on the network 3.3 kva
- Network Reinforcement that can't meet demand
- Solution increases substations by a 1/3 - £100k ps
- Variable outside temperature – lows as -5°C
- High electricity bills in Winter months
- Different user experience – constant lower temp
- Supply chain for parts / servicing ?
- External appliance – exposed to elements
- Theft Risk
- 10 – 15 year life span
- System and Maintenance – Homeowner/Landlord



HEAT NETWORKS.

Not just for towns & cities

In the past

- Previous plastic (pipe) deteriorates when $> 80\text{ }^{\circ}\text{C}$
- Steel pipe had to be used, as Building Regs had high temp water
- Steel is expensive – cost restricted to high-density
- Would be c£15k / house – and gas network is 'free'



The game-changers

- Temperature of hot water in homes is lower under building regs – we can use modern plastic (insulated) heat pipe. This comes in drums and much lower cost
- FHS ends use of gas for new build – with separate ASHP the counterfactual at c£6k / house
- Heat networks regulated by Ofgem from 2026, protecting homes on price and levels of service
- Heat networks - simple option for new build homes on low density housing sites
- We applied our experience of owning heat networks - developed the **Community Heat & Networked Ground Source Heat** to replace gas
- Scalable, competitive on cost
- Suite of technical standards developed by Ofgem and industry collaboration.

THE BENEFITS

No Risk. Cheaper than Owning ASHP.
Complete Peace of Mind.



Our sustainable heat solutions cost less than owning individual ASHPs and we cover all servicing, call-outs, repairs and replacement costs of the heat interface unit (HIU) or ground source heat pump.



Homes own no equipment and have no surprise costs to worry about including completely removing the risk to the homeowner of having a shock replacement cost.



We publish guaranteed standards of service to attend homes within 12 hours.



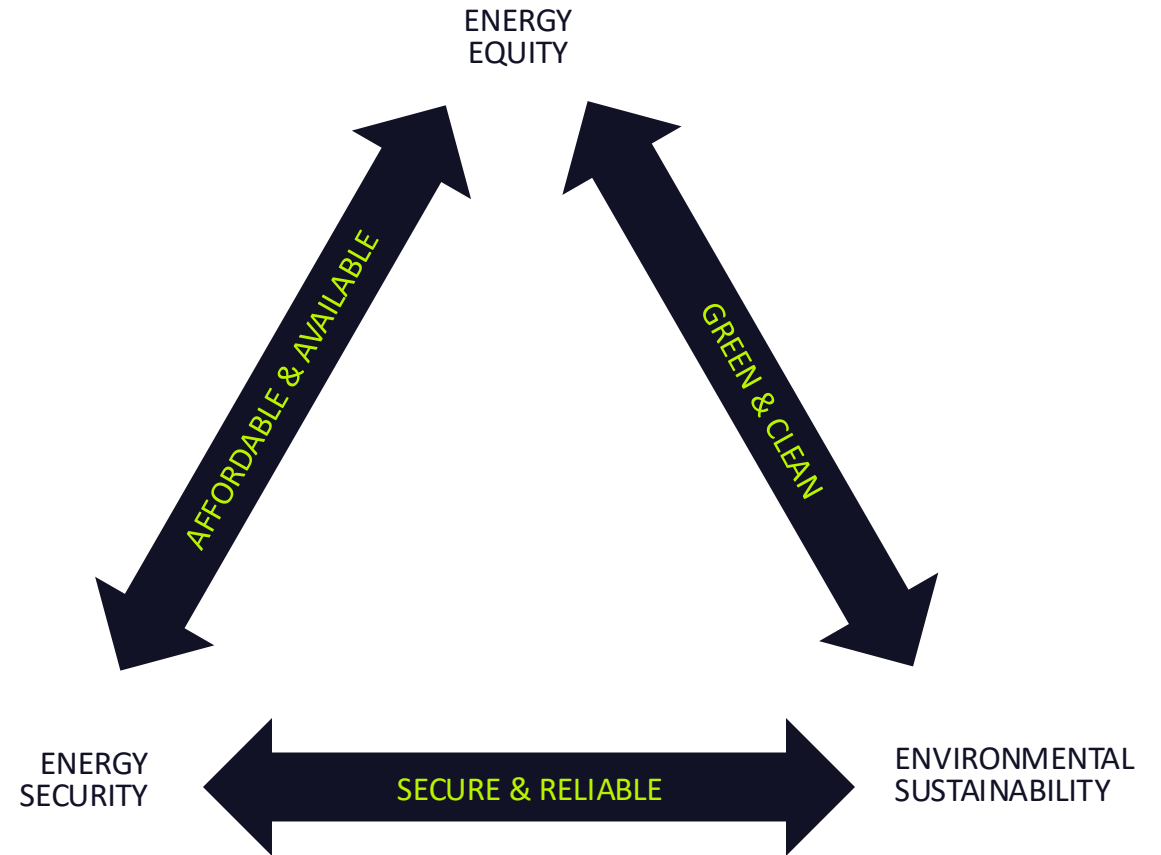
We pay the customer if we miss them and have been Ofgem regulated since January 2026.



By investing long-term in our heat network and heat equipment, we provide a full consumer service whereby, for a fixed fee, we cover all future servicing, maintenance and replacement of the equipment and network forever.

THE ENERGY TRILEMMA

Low-carbon heat is no longer optional, it is essential. As regulation tightens, consumer expectations evolve, and climate pressures intensify, the need for scalable, high-performance solutions becomes ever more urgent. GTC's networked ground source heat pump system enhanced by smart control from Passiv UK, meets that need head-on. It provides a future-ready answer to the UK's energy trilemma: ensuring homes that are secure, affordable, and sustainable by design.



For developers committed to delivering net zero communities and futureproof homes, GTC offers more than just heat. It offers leadership, compliance, and long-term value embedded in the ground beneath every home.



INVESTING IN SMART TECHNOLOGIES

Having established reliable networked heating solutions, we have not sat idle! We have been investing-in and developing smart technology businesses to further improve the customer experience and increase value to both housebuilders and homeowners.

We have acquired and invested in the development of the leading Smart Thermostat for Heat Pumps:

Improves efficiency
of heat pump by
managing demand profile



Comfortable
temperatures
for the home
when needed



Manages complexity
– simple to control



Reduces installation
risk by managing heat pump
commissioning

We have acquired and invested in battery and Grid Flexibility Services capability – this enables us to supply batteries to residential and commercial situations and provide a shared revenue stream by making those batteries available to support the grid when required. This can significantly improve the economics of adding a battery to a property and shorten payback times.

COSMESTON FARM

Leading the way to zero carbon homes

- GTC supported Barratt Redrow and the Welsh Assembly Government in shaping a credible net-zero carbon-in-operation solution for a 576-home scheme at Cosmeston Farm, South Wales.
- Intended to become one of the UK's first large-scale zero carbon housing developments.
- We have worked closely with Barratt Redrow and their partners to help model site-wide energy demand and generation, coordinate specialist technical inputs, and support engagement with stakeholders as the project has progressed.
- In addition to achieving this ambitious carbon target, these homes will be cheap to run, easy to use and benefit from our ongoing maintenance and UK-based customer service.

By bringing together our multi-utility expertise with our smart technology capabilities, we helped develop an integrated proposition that combined utility infrastructure with solutions such as:



Networked ground source heat pumps



Smart thermostats



Battery storage



Energy monitoring

Supporting real-world performance and long-term sustainability outcomes.



IN SUMMARY

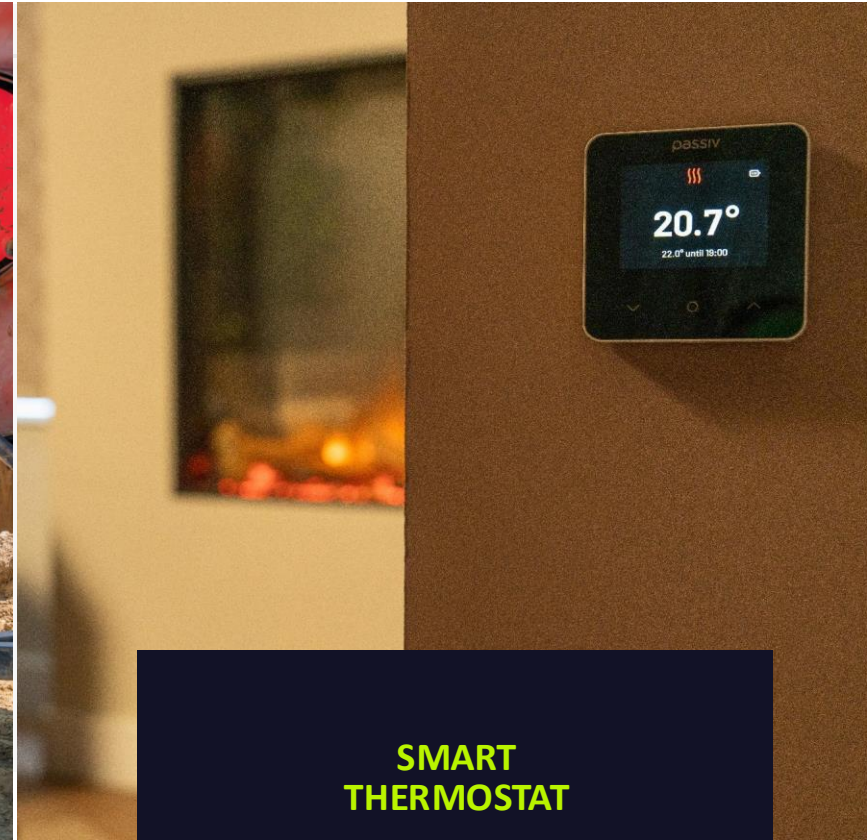
The solutions we offer:



**COMMUNITY
HEAT HUB**



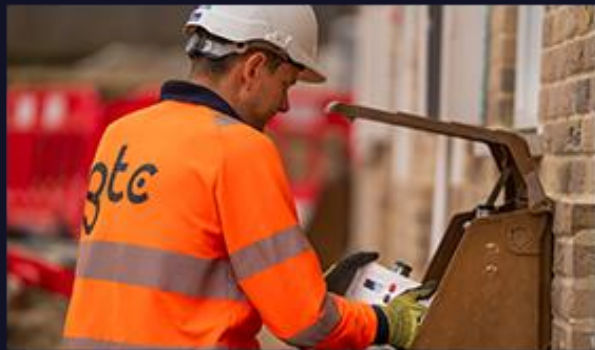
**NETWORKED GROUND
SOURCE HEAT PUMPS**



**SMART
THERMOSTAT**



Invested. Regulated. Delivered for Life.



Our integrated multi-utility offering includes:

- Low-carbon heat
- Electricity
- Gas
- Water
- Wastewater
- Gigabit fibre

GTC is uniquely structured to design, build and operate all six utilities under long-term regulated frameworks. This ensures transparent pricing, high safety standards and dependable performance for the lifetime of the development – giving lasting confidence to housebuilders and residents.



Future Homes Standard Technical Conference

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Feeling the heat: part 2

Firat Ucer
Regional Sales Manager
NIBE

NIBE

HEJ

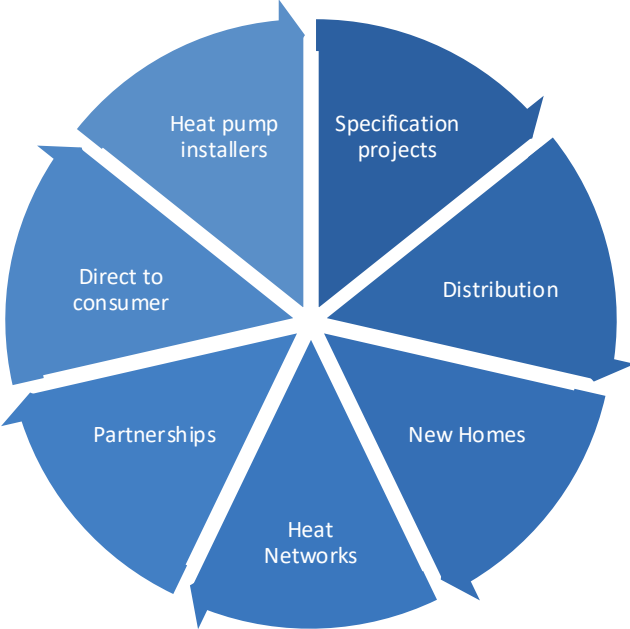


NIBE Energy Systems Ltd



Our Route to Full Market Coverage

NIBE



+



=

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 – CO₂ & Humidity optimisation
Versatility – cMEV and Balanced Supply vent solutions

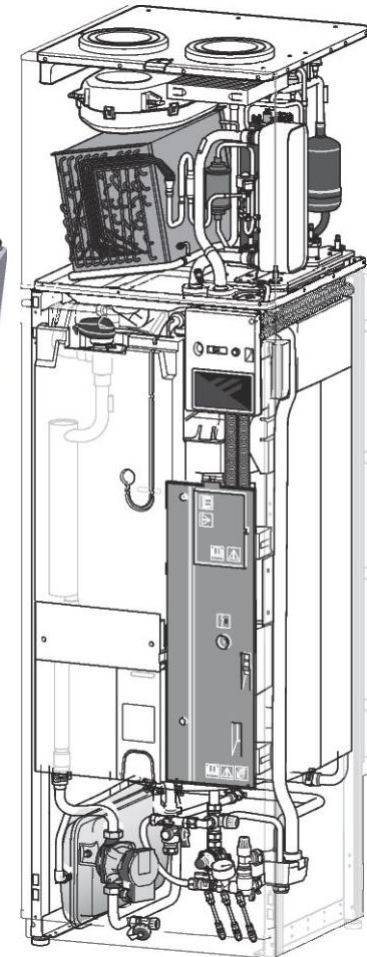
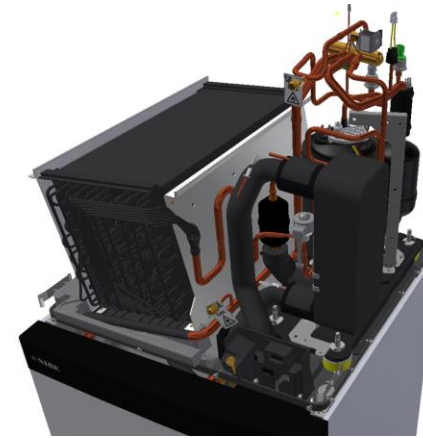
NIBE



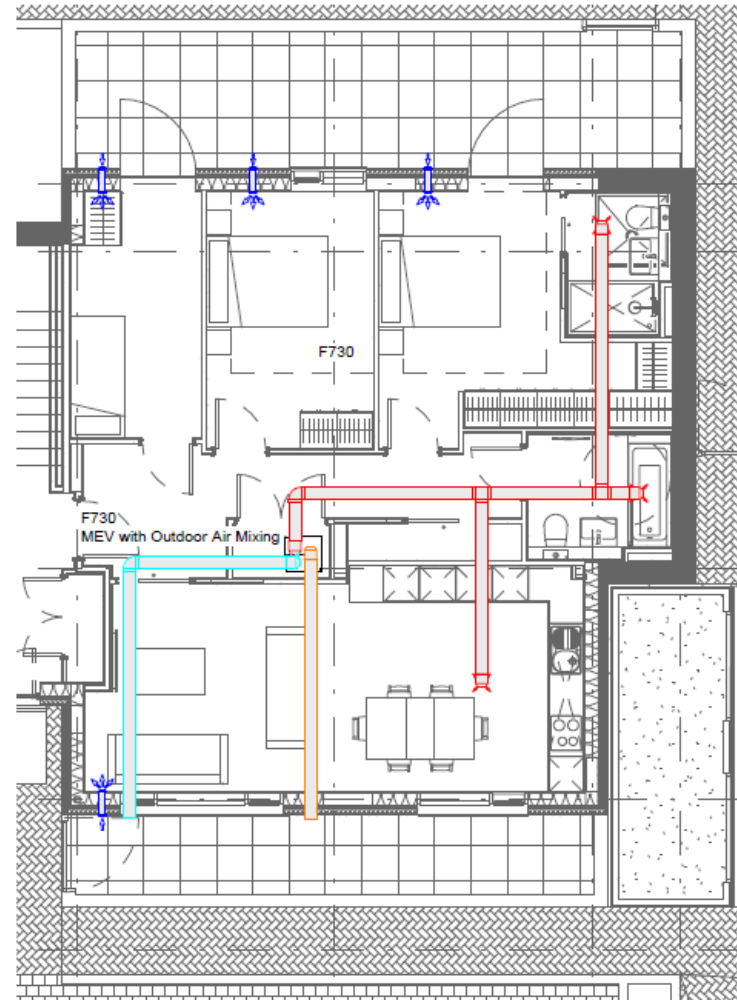
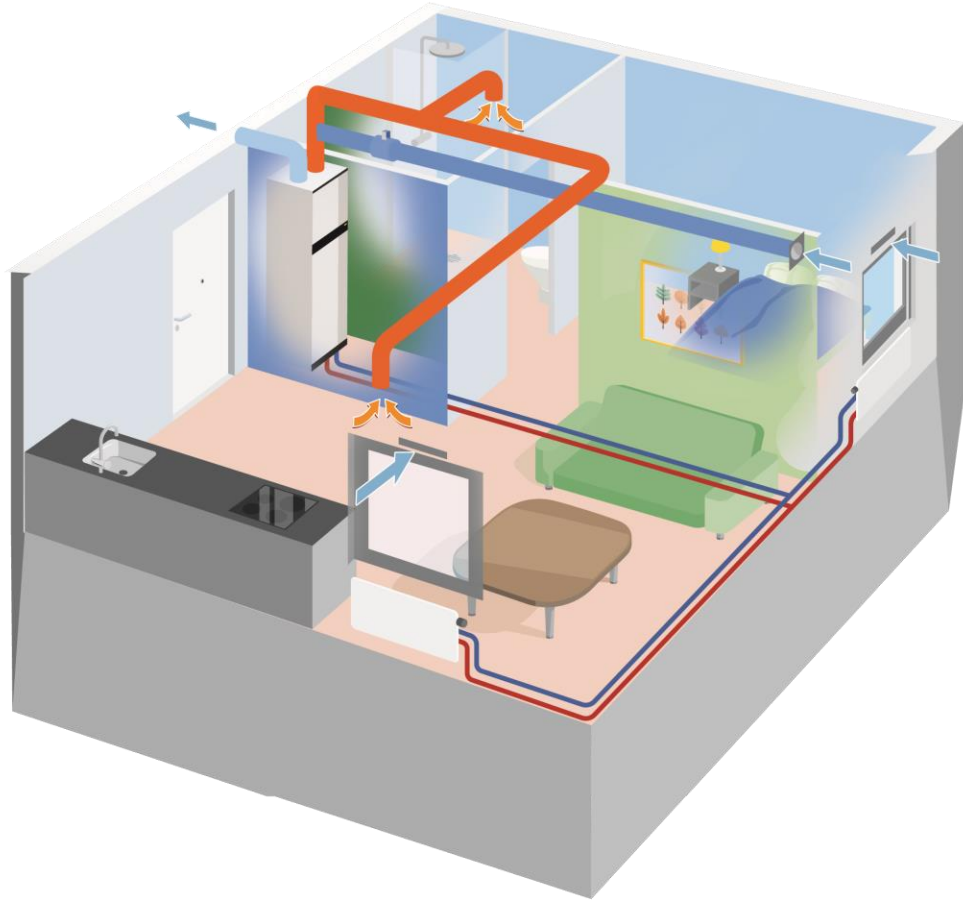
S735-7 C

NIBE

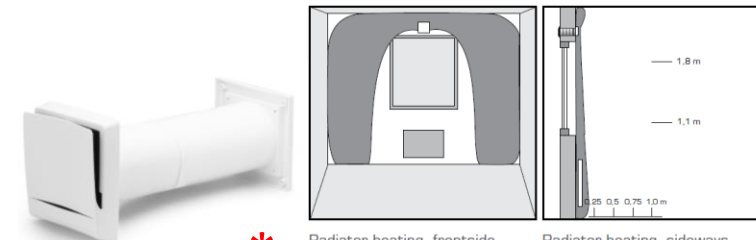
- Active cooling can be provided to UFH or fan coils, via a two-pipe system
- Up to 3kw cooling output (dependent on air flow rates & OEK*)
- Cooling flow temp. of 18° C
- Cooling flow temp. down to 15° C with the use of a humidity sensing stat (THS 10 or ROT 10)
- Fan can be run at 100% whilst cooling-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



S735-7 C Operating Principle



NIBE



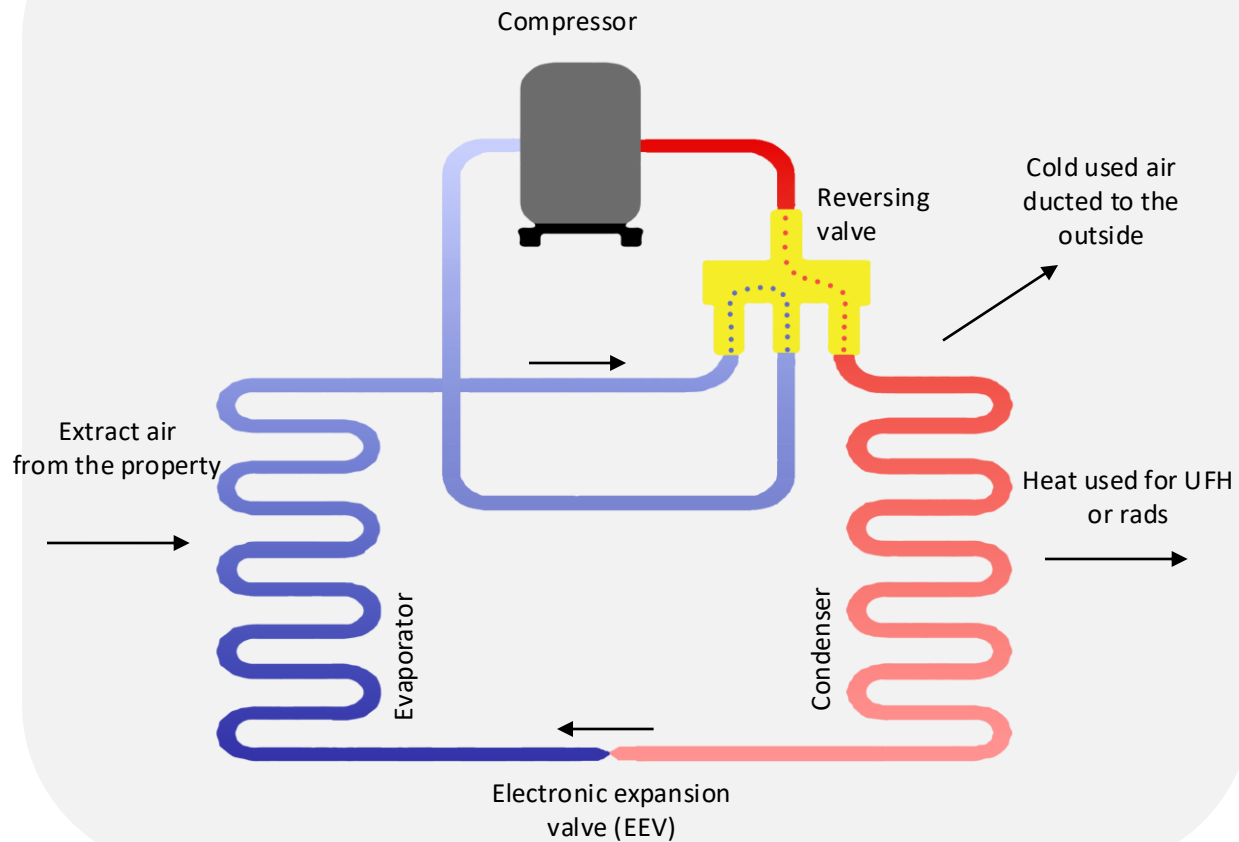
Radiator heating, frontside
Airflow 8 l/s,
indoor temp +21°C
Power 500 W,
outdoor temp -20°C

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

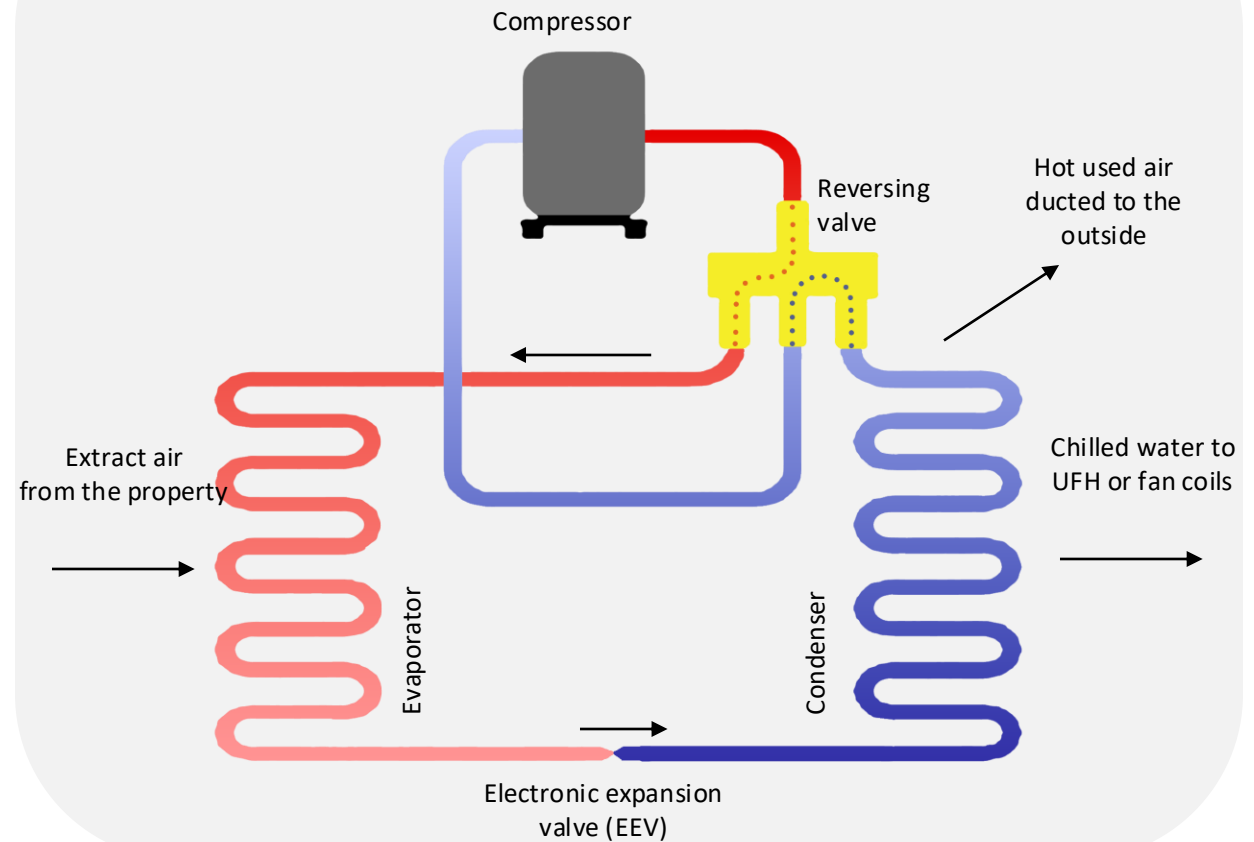
S735-7 C

NIBE

Heating Mode

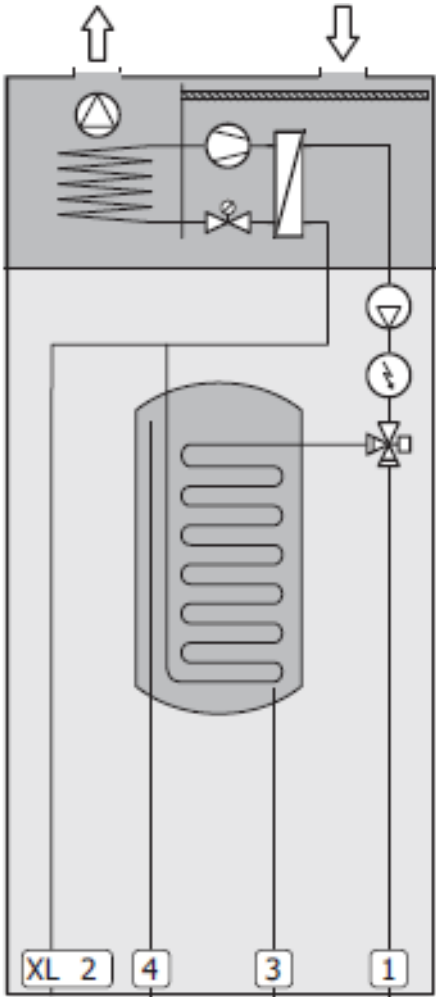
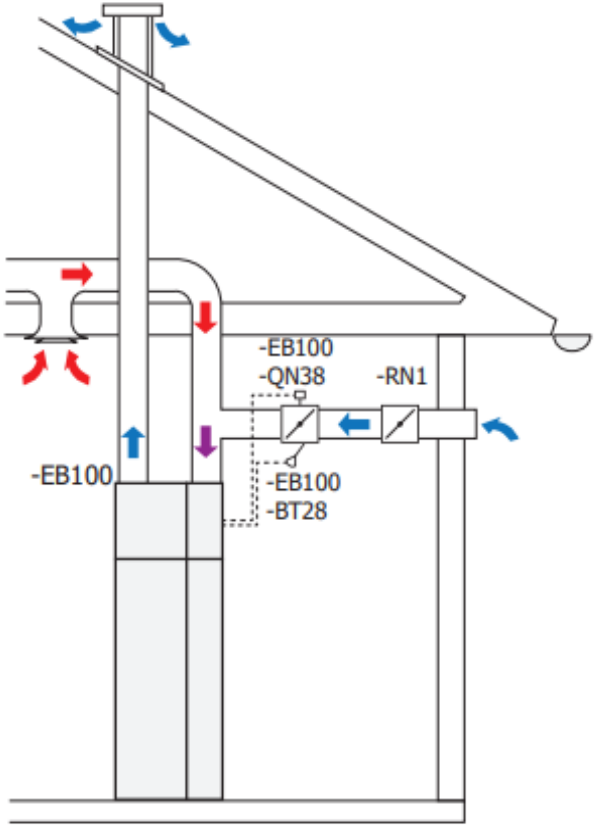


Cooling Mode



S735-7 C

NIBE



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

NIBE



S735-7 C Additional Accessories

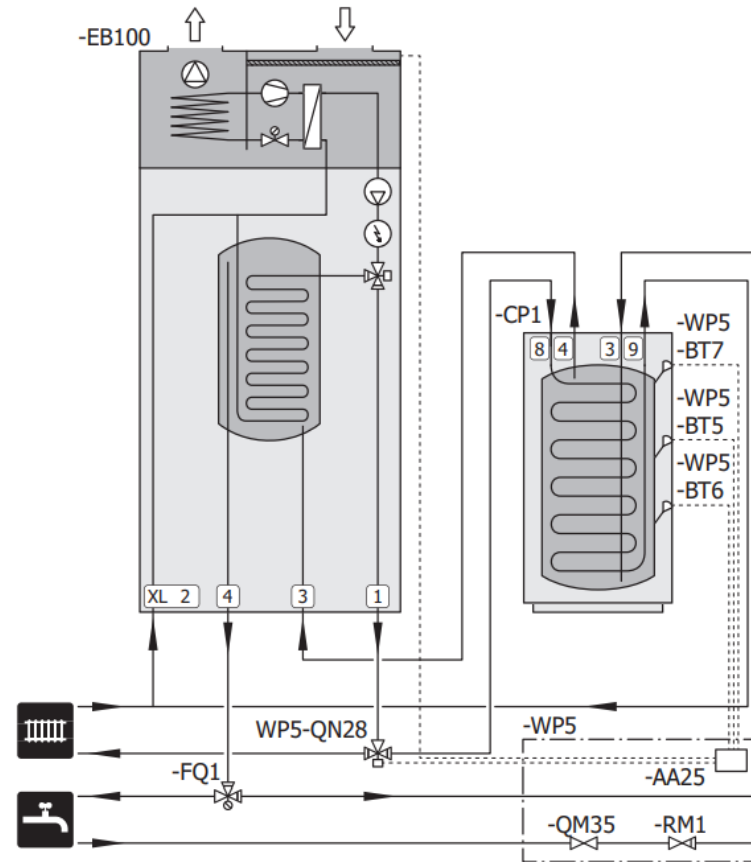
- **DEW S42**

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

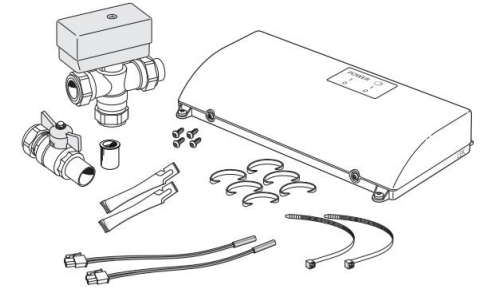
Hot water draw comes from internal S735 C cylinder, which is replenished with the water contents in the relevant cylinder accessory.

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

OUTLINE DIAGRAM



NIBE



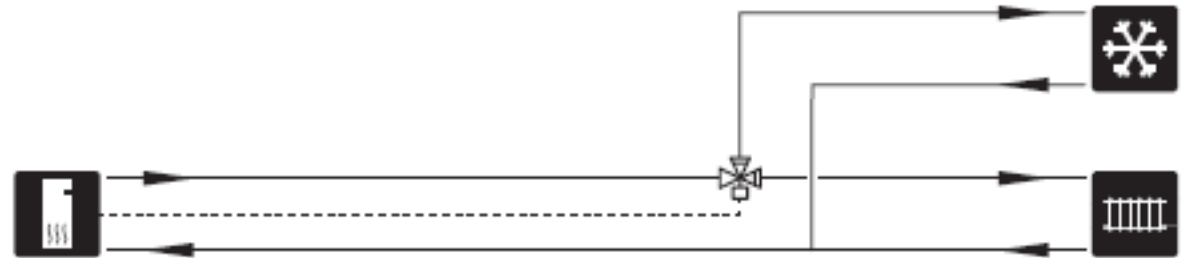
S735-7 C Additional Accessories

NIBE

- **VCC S12 (267009)**

New Three-way valve

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



NIBBE



Future Homes Standard Technical Conference



Feeling the heat: part 2



Dan Neasham
Head of Sustainability
and Performance
Future Homes Hub



Dr Jaydeep Bhadra
Domestic Sector
Technical Manager
CIBSE



Max Becker
Head of MEP
Wates



Adam Tckaz
Business
Development Director
- Sustainable Heat
GTC



Firat Ucer
Regional Sales
Manager
NIBE



Future Homes Standard Technical Conference



NETWORKING BREAK

Coming up next...
Learning by doing



Be sure to share your experience on LinkedIn using #FHSReady



Future Homes Standard Technical Conference



Learning by doing



Ross Holleron
Head of Homes and
Construction
Future Homes Hub



Dr Tom Dollard
Partner - Sustainability
and Innovation
Pollard Thomas Edwards



Clifford Elwell
Professor of Building
Physics
University College
London



Adam Tilford
Technical Innovation
Project Manager
Vistry



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Learning by doing

Clifford Elwell
Professor of Building Physics
University College London

Making pilots count: designing for actionable and transferable learning

Prof Cliff Elwell

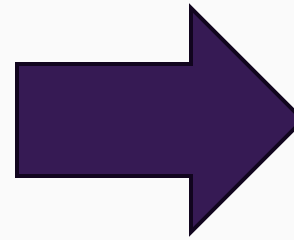
17th June 2026

UCL Energy Institute



Why pilots fail

No clear learning objectives
Measurement starts too late
Findings not fed back
Methods differ across sites



Repeated mistakes
Low confidence
Slow improvement
Poor scalability

High aspirations, but weak alignment between aims, methods, timing and action

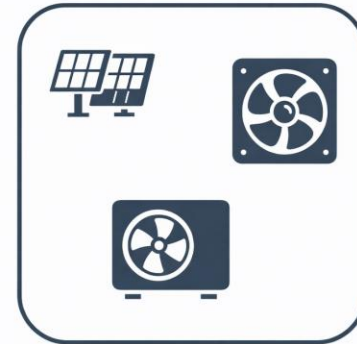
The solution: design pilots as learning systems

- ✓ Start with clear learning questions
- ✓ Match methods to project stage
- ✓ Involve relevant stakeholders early
- ✓ Focus on priority risks (not everything!)
- ✓ Design for feedback, action and transfer of learning

The key determinant of pilot success is not what is built, but how much is learned and used to improve future build



Building Performance Evaluation (BPE): mapping aspirations to evidence



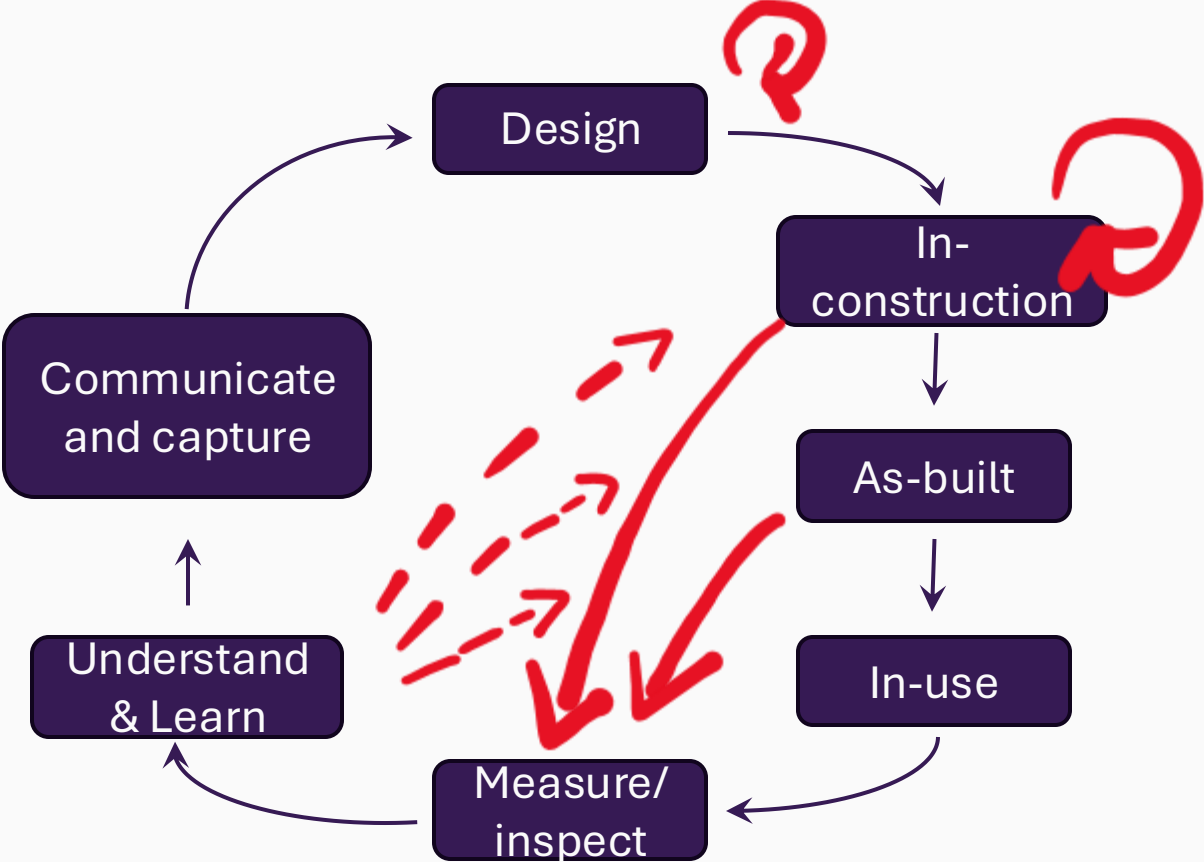
To understand:

- Fabric
- Services
- Energy use
- Indoor environmental quality (IAQ, overheating, noise)
- Householder experience

Why we do it:

- Verify design performance
- Assure build quality
- Improve customer outcomes
- De-risk new systems (e.g. HP)
- Support continuous improvement

Pilot design as feedback loops



- Learning happens at multiple stages
- The learning that matters is the learning that changes practice
- Focused pilots generate clearer, more transferable learning

Design stage:

define what needs to be learned

 HM Government

The Building Regulations 2010

**Energy and greenhouse
gas emissions**

APPROVED DOCUMENT



Volume 1: Dwellings

Requirement L1: Conservation of fuel and power and minimisation of greenhouse gas emissions in buildings

Requirement L2: On-site generation of electricity

Requirement L3: Renewable electricity generation – dwellings and buildings containing dwellings

Regulations: 6, 11F, 22, 23(1), 23(2), 24, 25, 25A, 25B, 26, 26A, 26C, 27, 27A, 27C, 28, 40, 40A, 40C, 43, 44, 44ZA

2026 edition – for use in England

- Risks e.g. complex construction
- Uncertainties e.g. availability of materials
- Review details e.g. air barrier, thermal bridges
- Appropriate specifications

- Draw in insights from previous work

- Design BPE and integrate into plans

In-construction:

capture failures, successes and their causes



Opportunities:

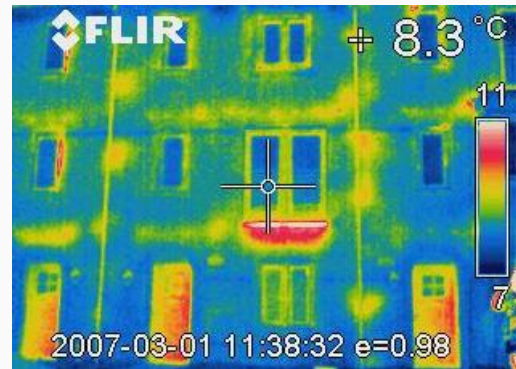
- Learn from airtightness testing and commissioning
- Inspect construction against design
- Record where buildability, sequencing or installation proved difficult
- Capture feedback from site teams
- Draw in insights from previous work

As-built: establish what has been delivered

Fabric and airtightness

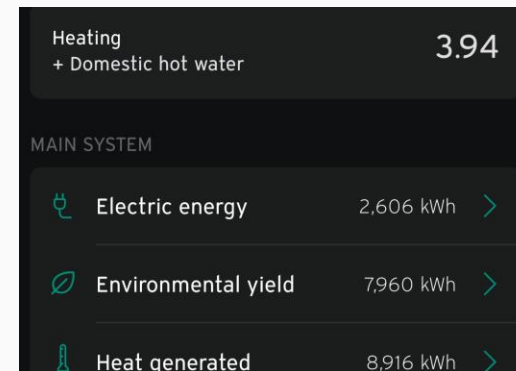


Aggregate heat loss test
(coheating)
QUB etc
“In-use” thermal
characterisation



IR camera
U-values

Services



Heat pumps
Test operation



Ventilation
PV
Controls

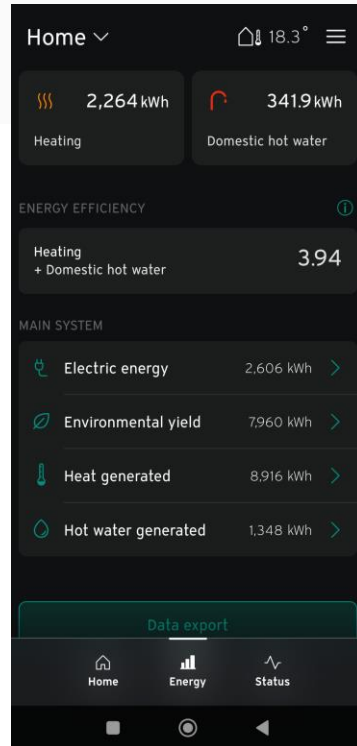
In use:

real performance in lived conditions

Technical Evaluation of SMETER Technologies (TEST) Project

Executive Summary

Loughborough University, Halton Housing, Leeds Beckett University, UCL



- Use operational data to assess performance
 - SMETERs (in-use thermal characterisation)
- Monitor indoor environmental quality
- Ongoing and automated checking of internet-connected services e.g. heat pump, PV
- Combine technical data with social insights from questionnaires, interviews and feedback

In-use evaluation reveals what customers experience.

Making findings transferable

- Standardise key metrics and methods
- Use a common dataset across all sites
- Record the context to understand differences
- Use a control: compare like with like where possible,

Site-specific findings = fix issues on that project

Cross-site findings = improve standards, details, procurement, and guidance

Turn findings into change

Avoid ending with reports and data alone

- Update standard details and specifications
- Improve QA, commissioning and handover
- Strengthen controls and occupant guidance
- Create repeatable monitoring templates
- Feed learning into future projects

Closes the feedback loop and implements change

Good pilots are...



- Question-led
- Embedded from design onwards
- Resourced and owned
- Able to identify and rectify problems
- Standardised enough for comparison
- Designed for transfer and change

The value of a pilot is realised only when learning is carried forward into future projects and organisational practice



Cliff Elwell



Future Homes Standard Technical Conference

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Learning by doing

Dr Tom Dollard

Partner - Sustainability and Innovation

Pollard Thomas Edwards

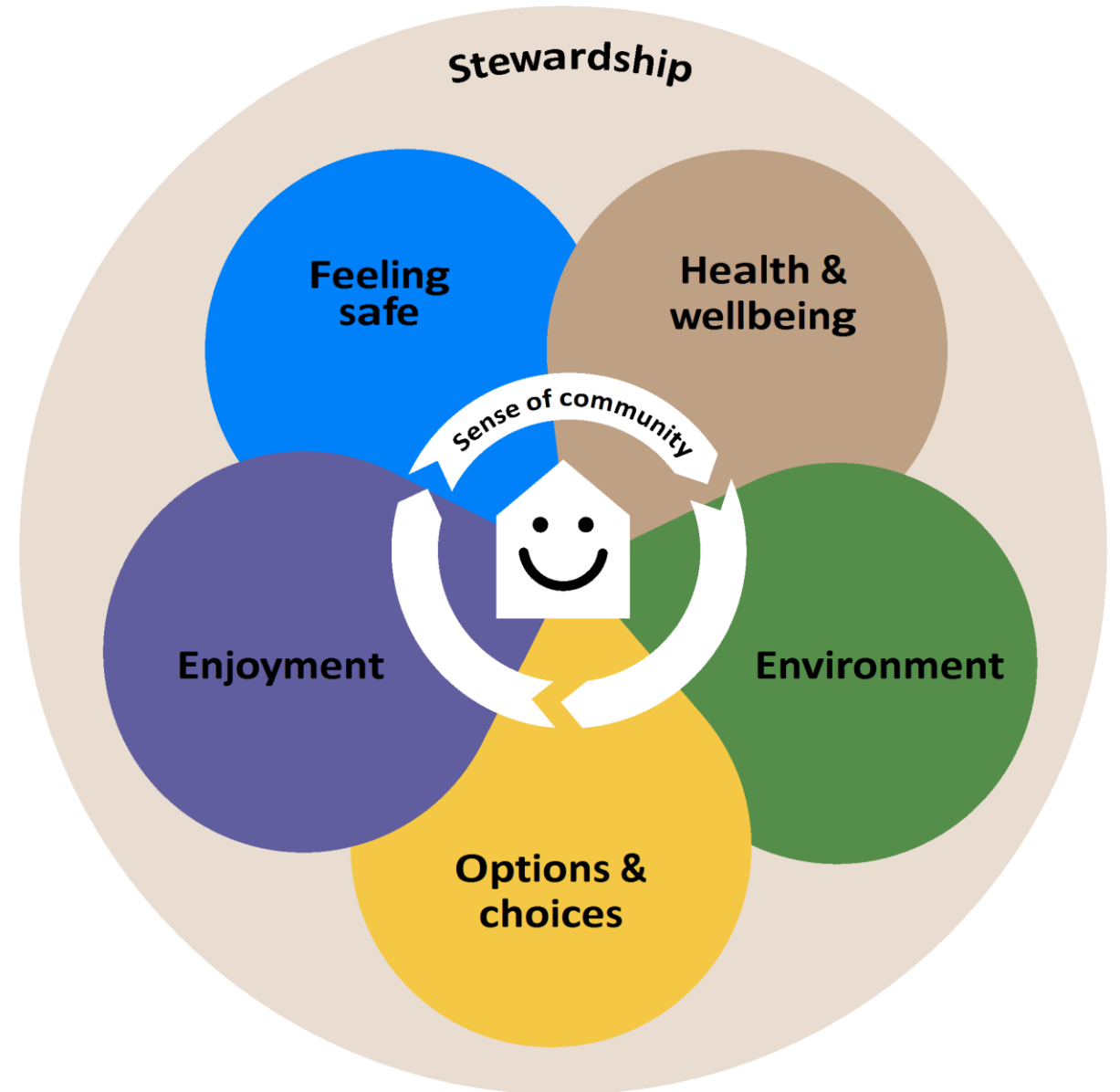
Future Homes Hub – London Tech Conference
Dr. Tom Dollard, Partner - Sustainability and Innovation
June 2026

**Pollard
Thomas
Edwards**



lilipii® happy homes project

The Happy Homes Toolkit measures the potential social value and performance of occupied homes under these 7 themes. The first step is to survey residents to find out their satisfaction levels with the new homes.



A man with a mustache, wearing a white and grey vertically striped button-down shirt, stands in a room. To his left is a large green plant with heart-shaped leaves. Behind him, a framed poster titled 'SRI LANKAN RAILWAYS' is visible on the wall. To the right, a woman is partially visible, smiling, though she is out of focus. The text 'Juniper House, Walthamstow' is overlaid in the center of the image.

Juniper House, Walthamstow

Juniper House

Waltham Forest, London



- RICS London and National Award - Residential
- Inside Housing Development Award - Best development
- Waltham Forest Design Award - Tall building

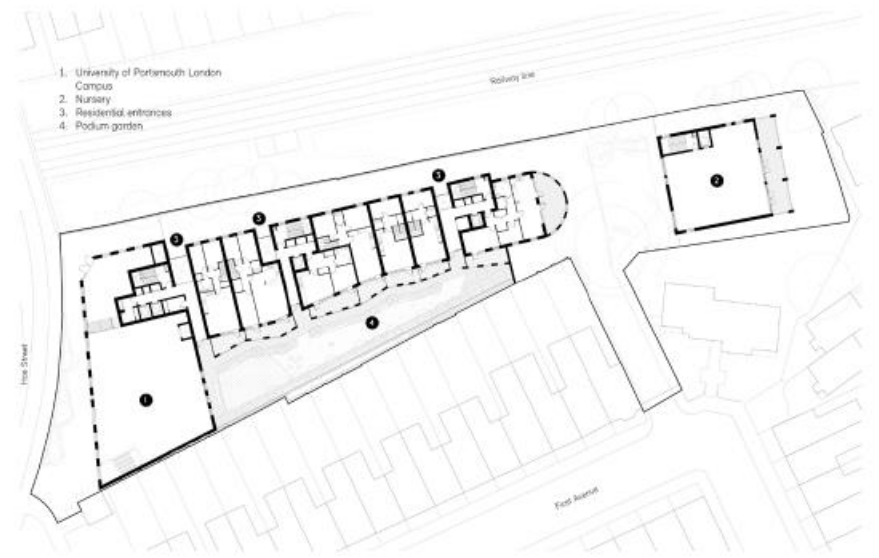
RIBA London Award 2026 Shortlisted

Client:
Waltham Forest Council and Hill

0.37
hectares

91
homes

16
storeys



Sixteen-storey Juniper House features 91 new mixed-tenure homes - more than half affordable - alongside a nursery for 53 local children and a university campus.

Executive summary

- **Energy costs broadly meet expectations**

Executive summary

- **Energy costs broadly meet expectations**
- **Overall comfort is strong, with a few design refinements needed**

Executive summary

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Executive summary

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- **Design tension: daylight vs thermal performance**

Executive summary

- **Energy costs broadly meet expectations**
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- **Overheating is the standout challenge**
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- **Simple design tweaks could deliver significant gains**

Executive summary

- **Energy costs broadly meet expectations**
- **Overall comfort is strong, with a few design refinements needed**
- **Overheating is the standout challenge**
- **Design tension: daylight vs thermal performance**
- **Simple design tweaks could deliver significant gains**
- **Operational and management factors matter as much as design**

Participants and their homes

All 91 homes at Juniper House were invited to participate in the survey, with 13 responding - representing 12 per cent of full occupancy.

happy homes project

We want to know what it's like to live at Juniper House - share your feedback

We are Pollard Thomas Edwards, the architects of Juniper House. We designed your home for Waltham Forest Council and want to know how it's working for you.

We're conducting a survey to understand what you love about your home and what could be better. Your feedback helps us create better homes for the future.

Residents who take part will be entered into a raffle to win a £100 voucher!

How to participate:

- Scan the QR code to complete the survey
- It takes about 20mins to complete
- Please have your annual electricity and water bill/statement to hand before you start as this is a mandatory question.

Complete the survey by 30 April 2025

For more info, contact Tim Metcalfe:
tim.metcalfe@ptea.co.uk | 020 7336 7777

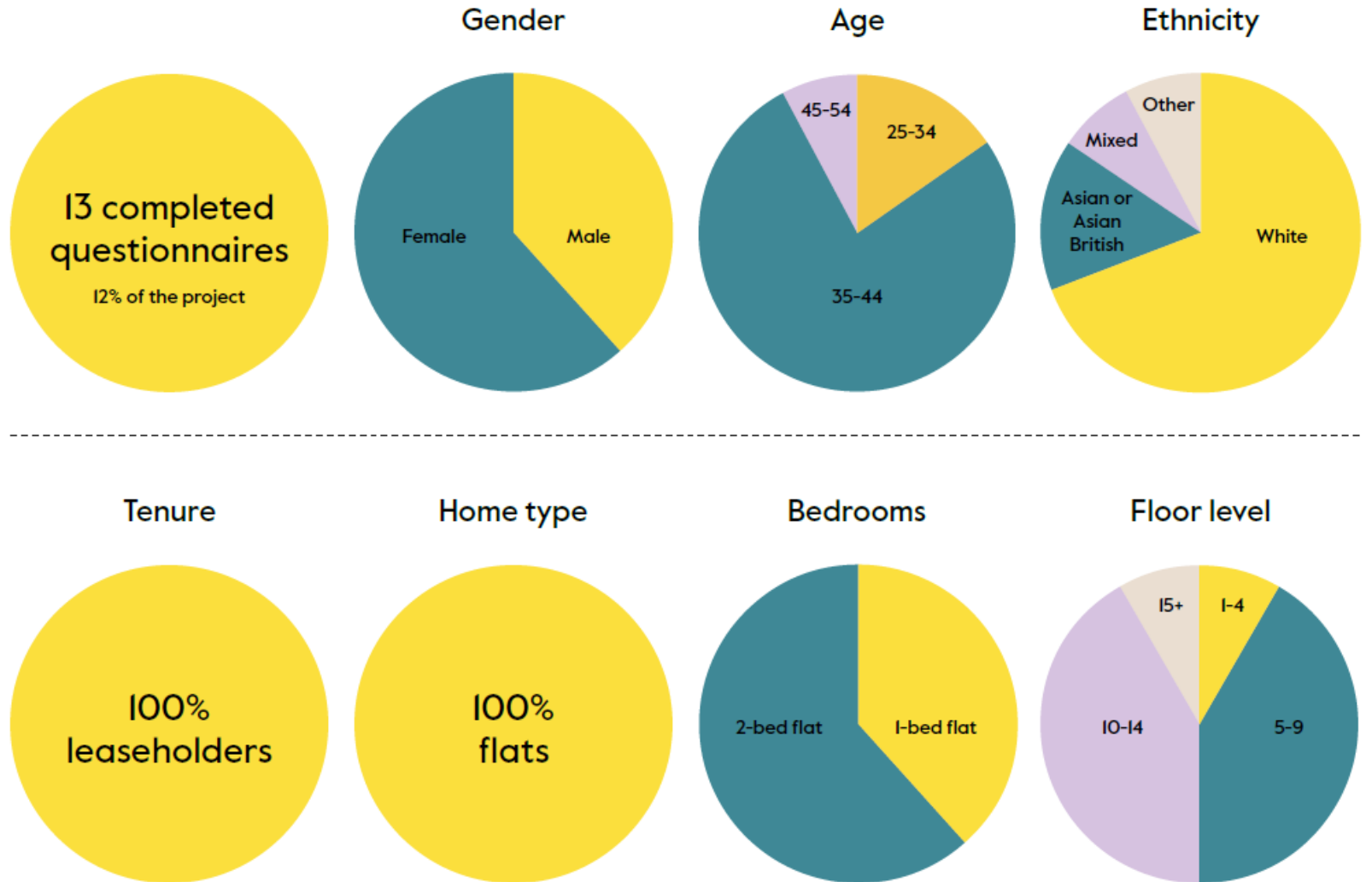
Pollard Thomas Edwards

Link to survey here or scan the QR code:
<https://shorturl.at/9fxB2>



Win a **£100** Voucher





Reported energy use



10 out of 13 respondents provided energy usage and billing data. The energy usage corresponds to electricity, hot water and heating combined.

Occupation	Annual energy use (kWh)	Annual standing charge	Total annual energy bill
1 person, 2 bed flat	1350	£132	£388
3 person, 2 bed flat	1662	£145	£565
3 person, 2 bed flat	1760	£144	£580
2 person, 1 bed flat	1756	-	-
1 person, 1 bed flat	711	-	£326
2 person, 1 bed flat	2550	£135	£860
1 person, 1 bed flat	1200	£60	£430
2 person, 2 bed flat	1952	-	£473
2 person, 2 bed flat	6413	£748	£1,826
1 person, 2 bed flat	1887	£163	£660

Annual usage
2,124 kWh/yr
average

Annual cost
£678
average



Reported water use



9 out of 13 respondents provided water usage and billing data, the usage corresponds to the actual occupancy which reflects a lower water usage per home and per person.

Occupation	Annual litre usage	Daily litre usage per person (Avg)	Total annual water bill
1 person, 2 bed flat	36000	98	£220
3 person, 2 bed flat	72000	66	£334
3 person, 2 bed flat	72000	66	£560
2 person, 1 bed flat	-		£240
1 person, 1 bed flat	21000	57	£150
2 person, 1 bed flat	70000	96	£144
1 person, 1 bed flat	36000	98	£168
2 person, 2 bed flat	43000	59	-
2 person, 2 bed flat	89000	121	£379

Daily usage

83 l/p/d

average

Annual cost

£274

average

UK
benchmark

105 l/p/d

average



Energy data comparison

This comparison looks at energy data reported by residents versus figures from publicly available Energy Performance Certificates (EPCs).

EPCs estimate primary energy use (PE) and costs for hot water, heating, and lighting. Findings also show that actual energy use is generally lower than design predictions using standard assumptions about occupancy and energy use.

Findings show that EPC-estimated annual costs align with residents' bills. Averages are used for comparison, though individual household data varies significantly - one outlier at £1,826 per year - likely due to differences in occupancy and usage patterns.

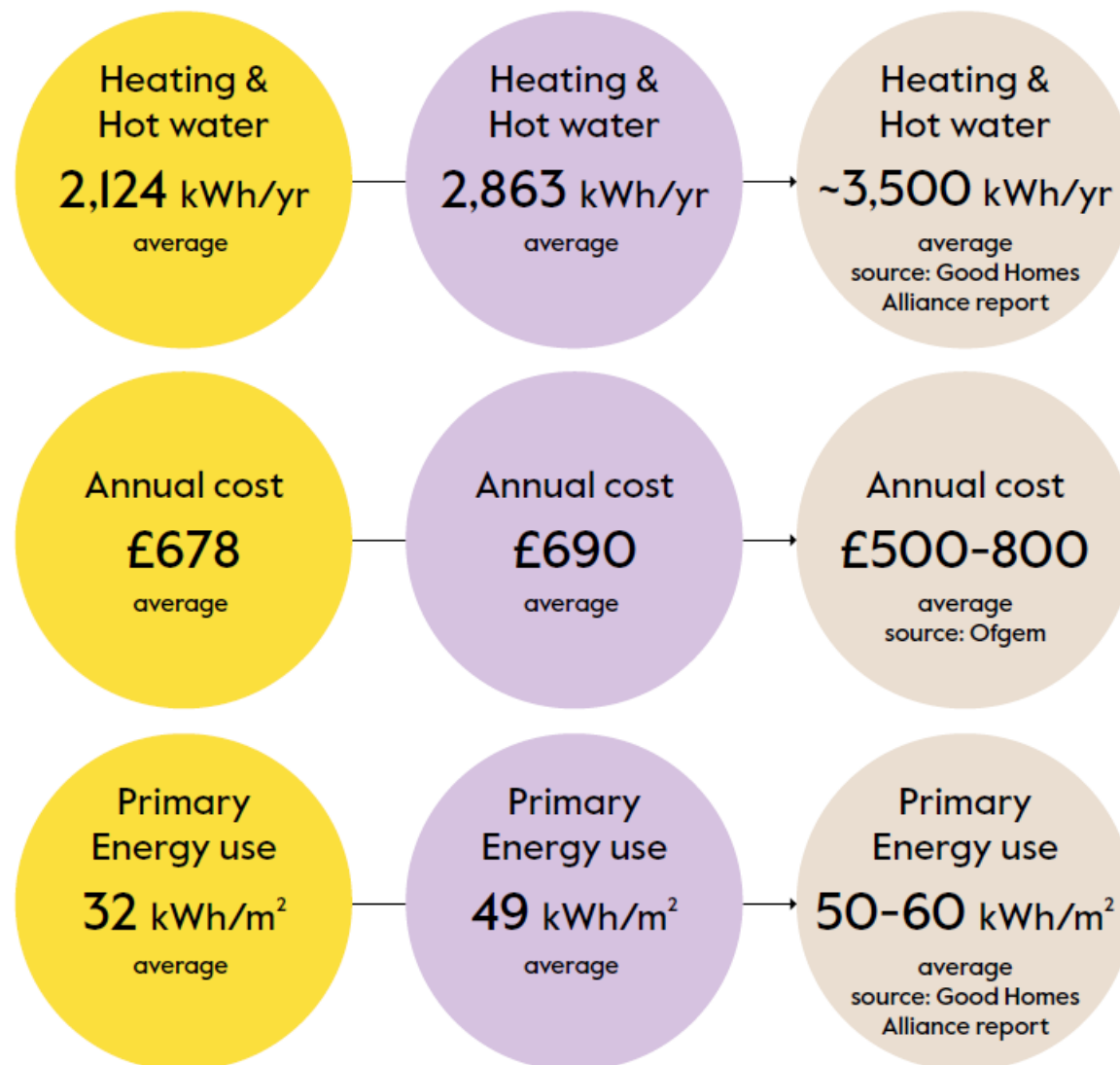
This data does not include the significant service charges for residents, which we understand cover landlord energy use. However, we can conclude that reported energy bills are in line with the design expectations.

Typology	PE use	Heating	Hot water	Costs
GF Maisonette - 84m ² / 2B4P	49 kWh/m ²	779 kWh/yr	2,138 kWh/yr	£729
Mid Floor Flat - 82m ² / 2B4P	52 kWh/m ²	1,055 kWh/yr	2,122 kWh/yr	£732
Mid Floor Flat - 50m ² / 1B2P	56 kWh/m ²	336 kWh/yr	1,823 kWh/yr	£513
Top Floor Flat - 51m ² / 1B2P	60 kWh/m ²	565 kWh/yr	1,828 kWh/yr	£543
Top Floor Flat - 78m ² / 2B4P	60 kWh/m ²	1,555 kWh/yr	2,092 kWh/yr	£779

Reported data

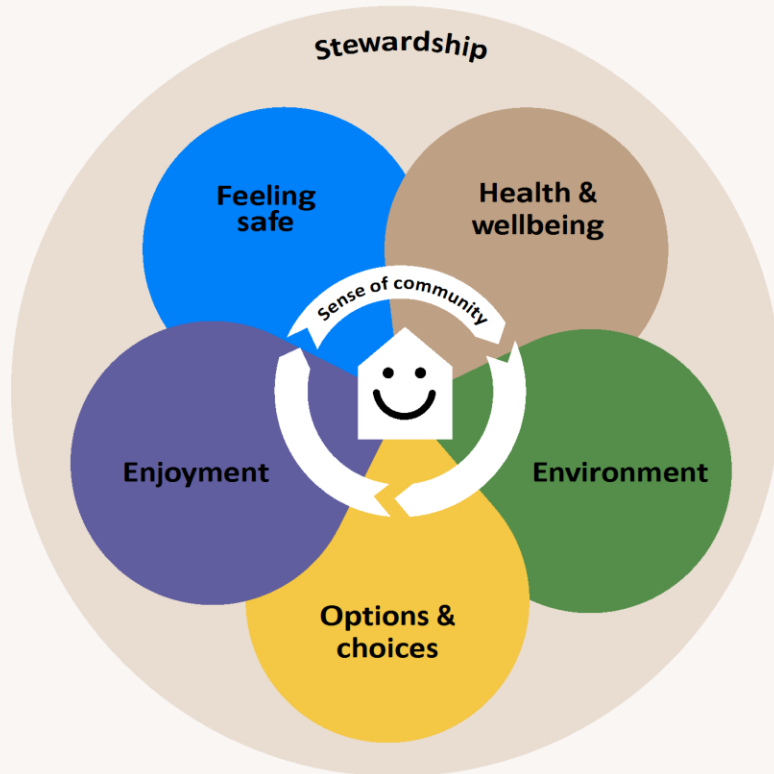
EPC data

National benchmark or average

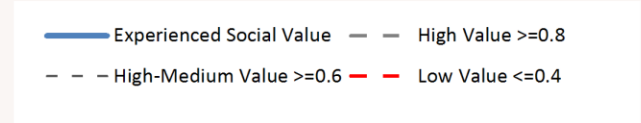


Happy Homes Toolkit results and findings

This section of the report presents an analysis using the **Happy Homes Toolkit** questions.



Experienced social value



Score (radar graph)

- Vertex above the black dotted line are high values (greater than or equal to 0.8)
- Vertex between the grey and black dotted lines are medium values
- Vertex below the red dotted line are low values (less than 0.4)

Feeling safe

What spaces, elements or details in your home help you to feel safe at home?

Most residents find the fob access to each floor very secure and having communal areas with natural surveillance is helpful; car park to podium access security could be improved.

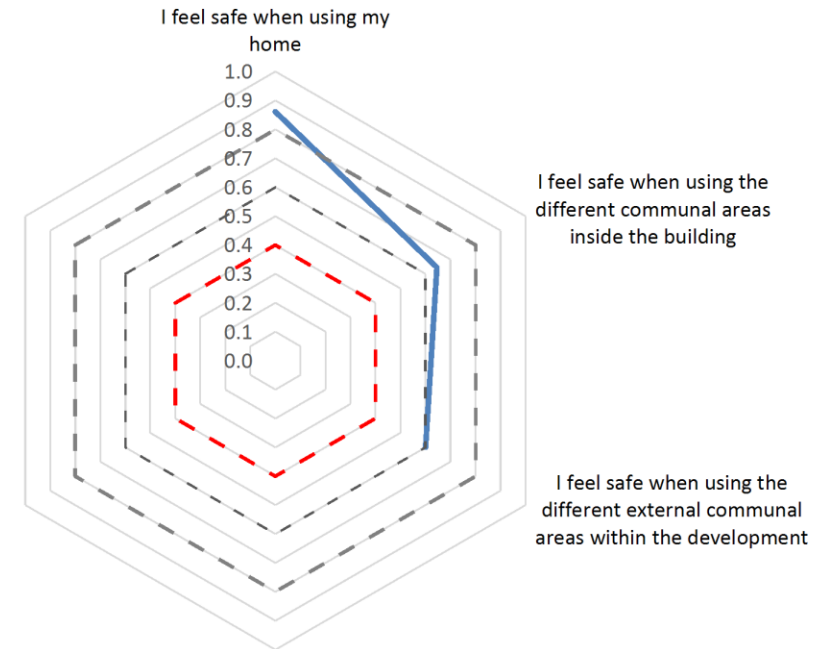
Do you have any general feedback about how safe you feel in your home?

Mixed opinions: shared access between blocks, and lack of secure parcel storage is felt to have led to parcel theft.



Feel safe in my flat, but not the development. Front and back gates are often left open, so anyone from the street can get into the development, parking area, and then the lobby. All of which should be secure.

— Experienced Social Value — High Value ≥ 0.8
- - High-Medium Value ≥ 0.6 - - Low Value ≤ 0.4



Health & wellbeing

Do you have any feedback about the temperature of your home

Warmth and good insulation are enjoyed in winter, but overheating is an issue in summer.

Would you like to share which spaces, elements or details in your home positively contribute to your physical or mental health?

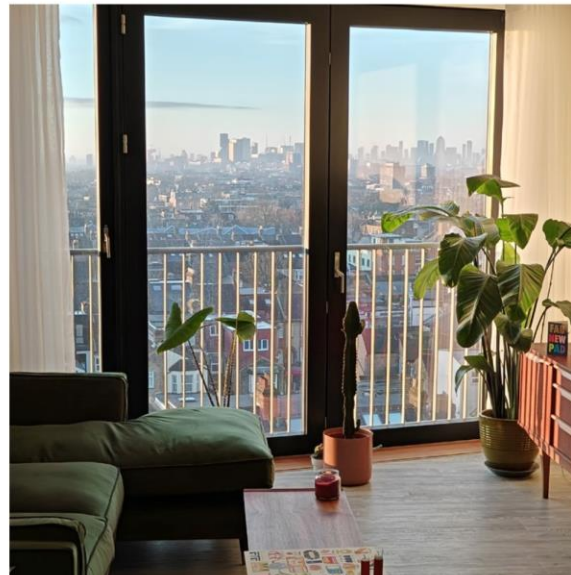
Big windows, location and varied views are popular, as is warmth in winter.

Do you have any feedback about the design of your home?

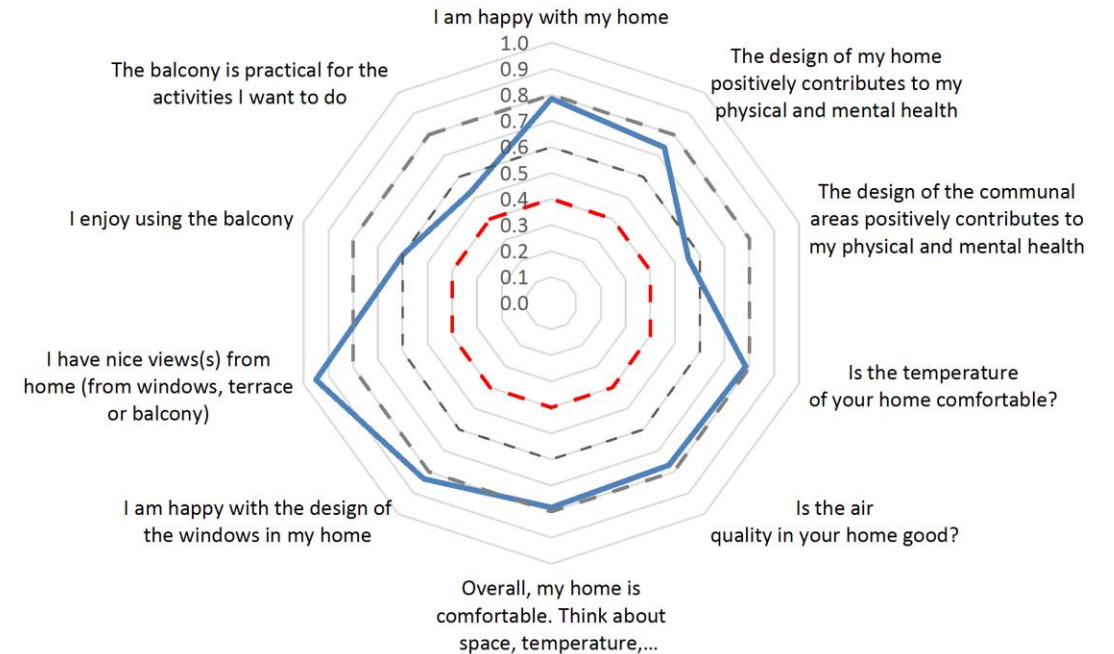
Wind making balconies unusable is the biggest issue, followed by storage configuration and size, with two people mentioning noise.

Would you like to tell us what activities you enjoy doing in your balcony?

People would like to read, dine with friends and exercise on balconies, but they are almost never sufficiently wind-free to allow these activities.



— Experienced Social Value — High Value ≥ 0.8
- - High-Medium Value ≥ 0.6 - - Low Value ≤ 0.4



Environment

Would you like to share what spaces, elements or details at home make you feel connected to nature?

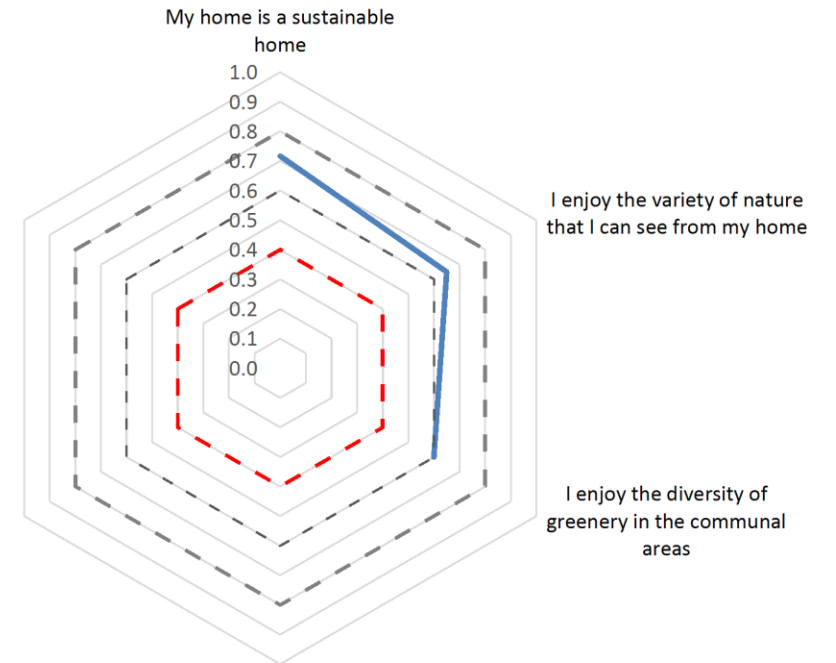
Most respondents were neutral on this question, but good views from the windows were mentioned. The lack of plants on the 9th floor terrace was the subject of one negative comment.

“

There are no big parks in the immediate area, but I enjoy seeing all the little bits of greenery across London with some occasional good views of large reservoirs. I love seeing vibrant colours in spring the most.

No effort at all has been made to decorate the ninth floor communal terrace so there is zero greenery there.

— Experienced Social Value — High Value ≥ 0.8
- - High-Medium Value ≥ 0.6 - - Low Value ≤ 0.4



Community spirit

Where is your favourite space to socialise in your home?

All responses to community spirit in the development were positive, with most highlighting living rooms as favourite spaces to socialise in the home.

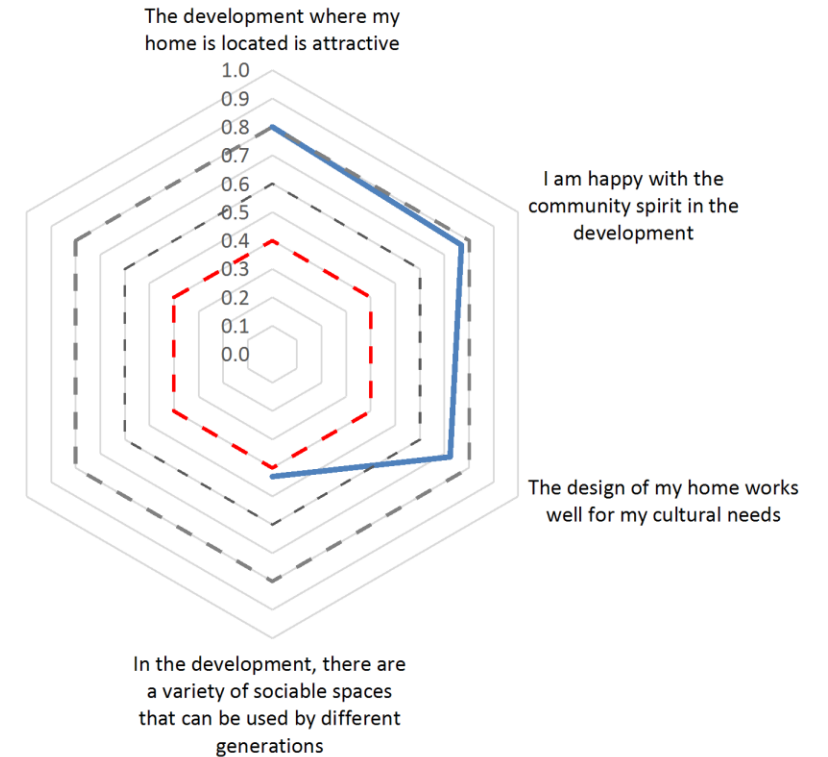
Where is your favourite space to socialise in the communal areas?

The lobby and communal gardens were mentioned as favourite social spaces, but most respondents did not nominate a space outside the home.

“

I do not really socialise much. However, we have a dog and the communal grassy areas are nice to meet with other dog owners from time to time.

— Experienced Social Value — High Value ≥ 0.8
- - High-Medium Value ≥ 0.6 - - Low Value ≤ 0.4



Options & choices

Do you have a pet at home?

A third of respondents have pets.

The design of my house is well suited for having a pet

Half felt it works for a pet, one neutral and one did not feel that their flat works for their pet.

Do you work from home?

Two thirds of respondents work from home.

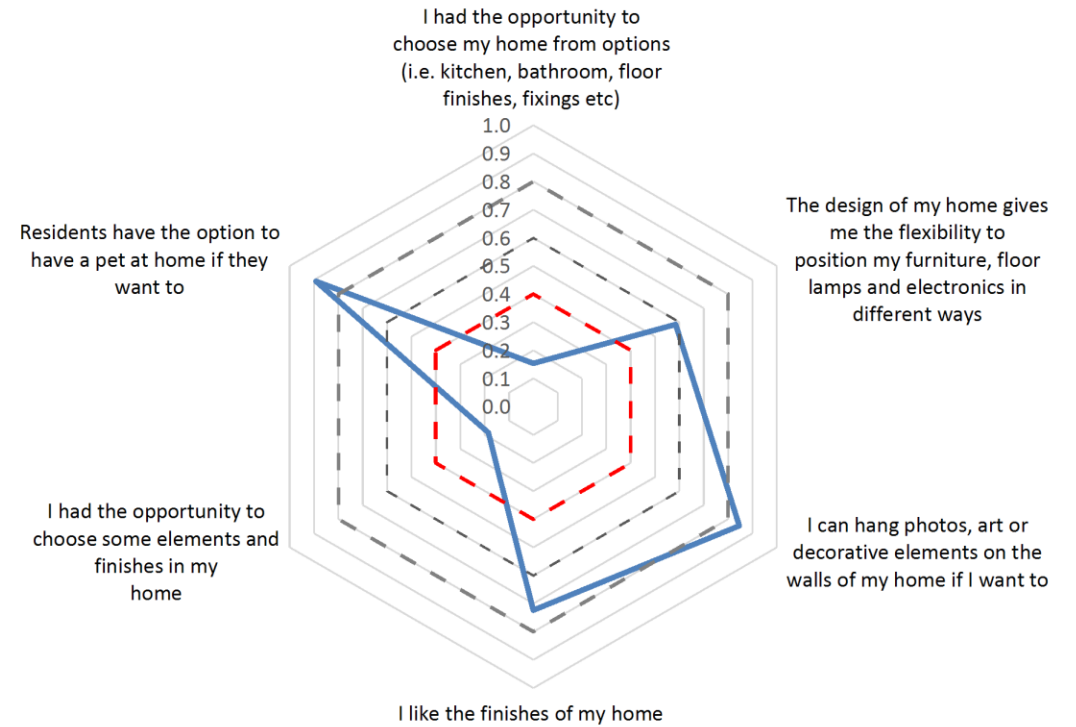
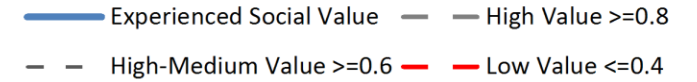
Are you happy with the space that you use to work from home?

Most are happy with the space for working from home.

Would you like to share where is your favourite space to work from home? and why?

Second bedrooms where available, otherwise main bedroom or dining table.

Some choice questions may not apply to buyers of finished homes.



Enjoyment

Would you like to share where your favourite space is in your home?

The living room creates the most enjoyment, including the balcony when usable on still days.

Would you like to share what limits enjoying your home or communal areas in the development?

Very windy conditions on balconies, security and lack of small opening windows were raised.

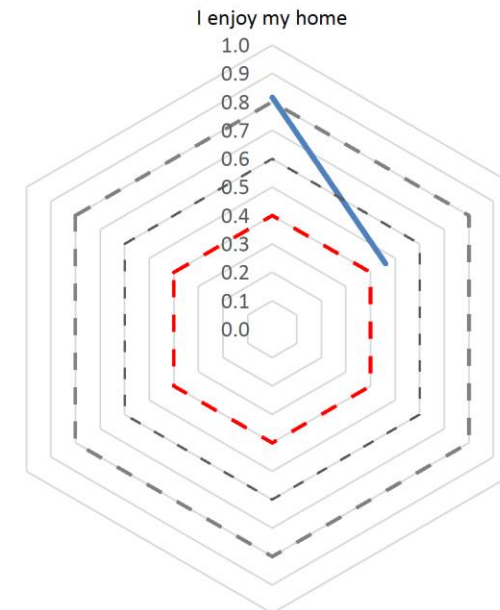
“

The large living area and kitchen with access to the balcony and beautiful views.

Often it's too windy to enjoy the balcony.



— Experienced Social Value — High Value ≥ 0.8
- - High-Medium Value ≥ 0.6 - - Low Value ≤ 0.4



In the development, there are a variety of fun and entertaining areas for different generations (toddlers, kids, teenagers, adults, and elderly people)



Stewardship

I can afford living in my home

As residents have just bought, it is perhaps unsurprising that most agree, or strongly agree that their home is affordable - including running costs. 3 out of 13 respondents are neutral, none disagree.

There is transparent communication between the landlord and residents from different ages

Only one positive response: this is however one of the easiest management issues to remedy.

The development is well maintained

This question cannot avoid inviting negative responses -there are

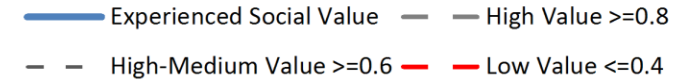
always some issues. Nevertheless, slightly over half of the responses are neutral or positive.

There are options for residents of all ages and ethnicities to be involved with the management of community spaces, spaces for socialising or social activities

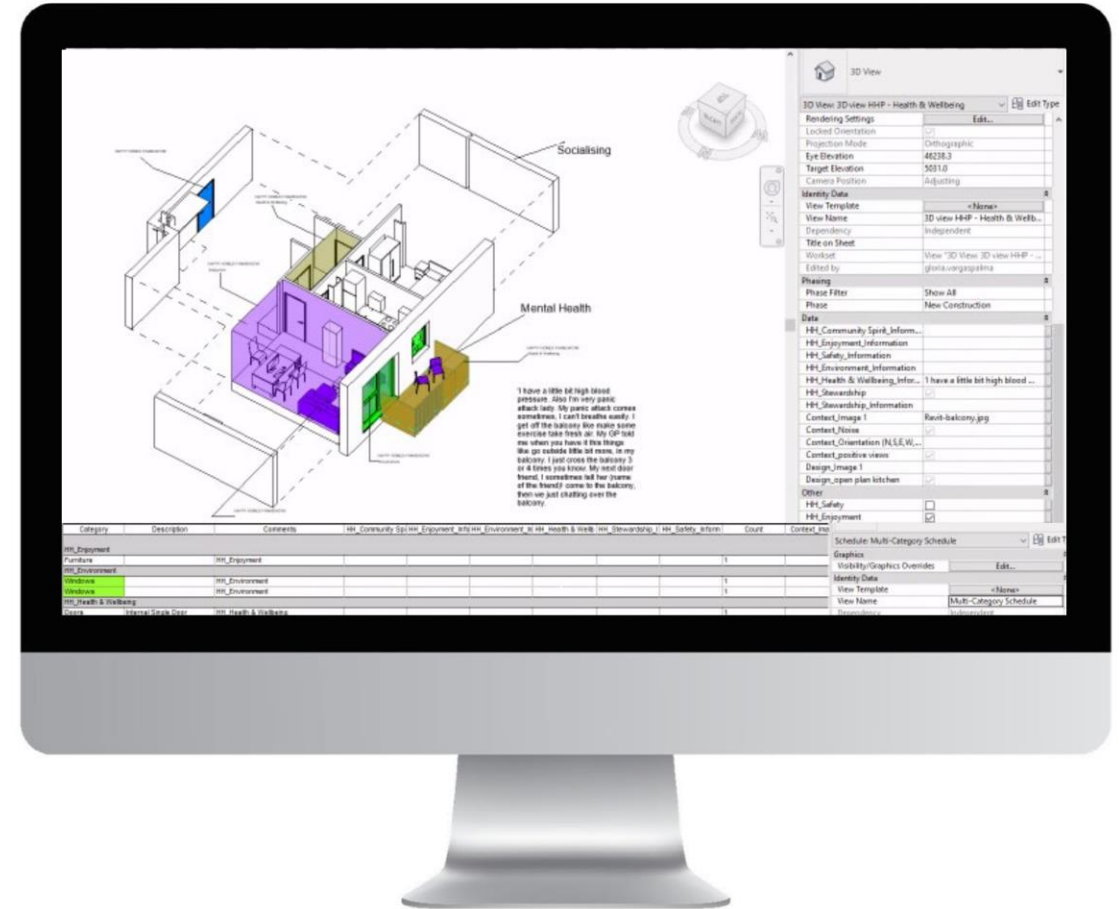
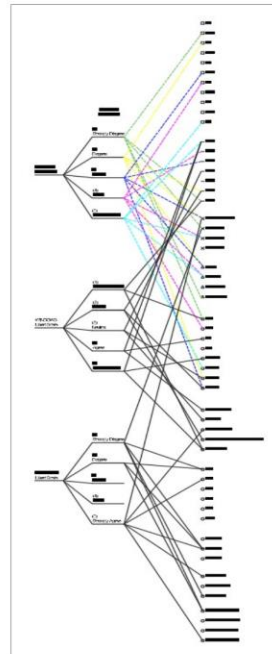
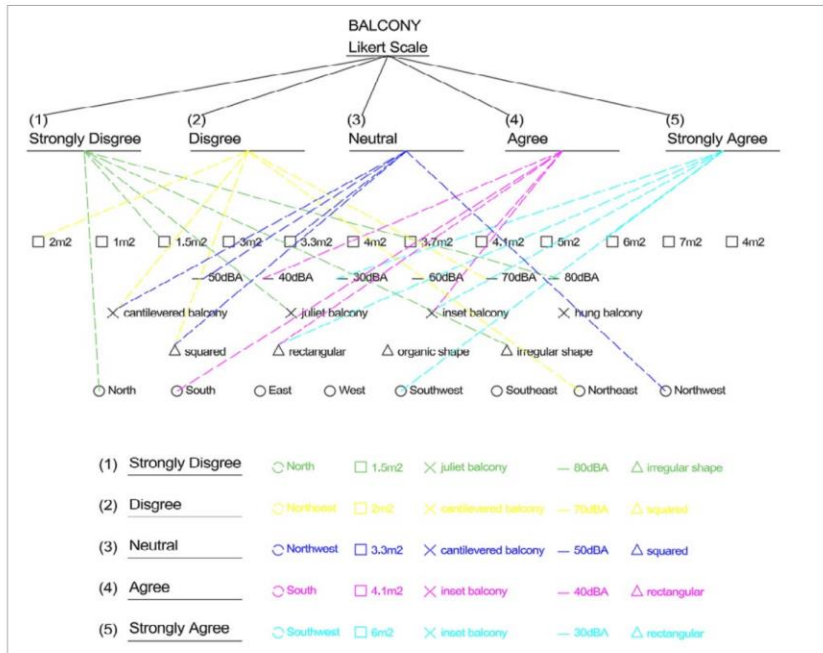
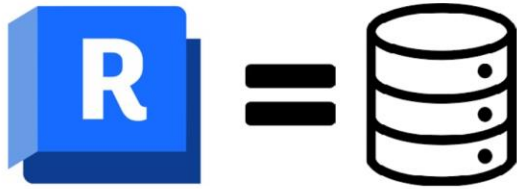
This is evidently not an aspect of management that has yet been developed.

There are opportunities for residents to participate in community programmes

There were no responses from affordable rental tenants, and it may be that leaseholders do not expect involvement in this kind of activity.



Next steps



Building up a data base of completed projects, so we can benchmark.

Please get in touch if you have a suitable completed development: tom.dollard@ptea.co.uk

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Future Homes Standard Technical Conference

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Learning by doing

Adam Tilford

Technical Innovation Project Manager

Vistry

FHS Technical Conference

Learning By Doing

Adam Tilford, Technical Innovation Project Manager

Vistry

**Bovis Homes**
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Homes

**COUNTRYSIDE**
Homes

Countryside
Partnerships

Learning lessons through doing

Carefully trialling future technology and specifications across the Group

1

Net Zero Carbon Homes (regulated energy)

Site: Europa Way Triangle, Leamington Spa
Region: VP West Midlands
Number of units: 54

2

Net Zero Carbon Homes (regulated energy)

Site: Stoneleigh View, Kenilworth
Region: VP West Midlands
Number of units: 310

3

District GSHPs

Site: Romney House, Bristol
Region: VP West

4

Community Heat Hub (communal ASHP & hot water)

Site: The Gateway, Bexhill
Region: Kent
Number of units: 801 homes, school, sports pavilion and community centre

5

Air Source Heat Pumps

Site: Reading Golf Club
Region: Vistry Thames Valley
Number of units: 211

6

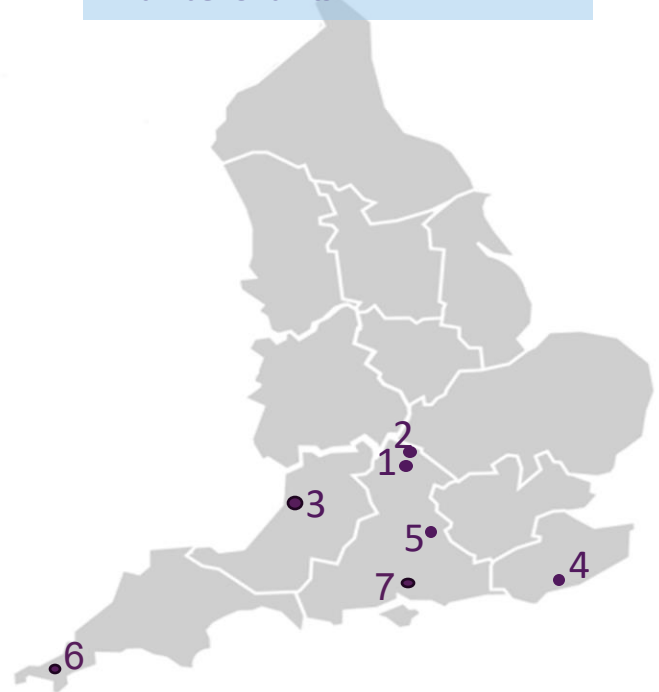
Low carbon homes & air source heat pumps

Site: Tolgus Farm, Redruth
Region: VP South West
Number of units: 185

7

AECB Design (Passivhaus)

Site: Parcel 6 North Whiteley
Region: VP Drew Smith
Client: Winchester City Council
Number of units: 54



High Level Learnings - Customer Awareness and Acceptance



High Level Learnings - Skills and Training



High Level Learnings - Infrastructure



High Level Learnings – Technical & Planning



Design – New Vistry Collection

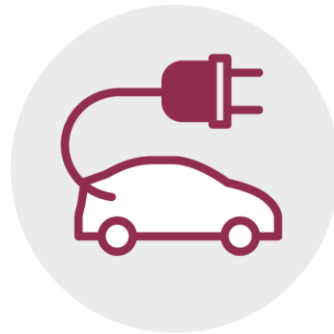


Learning lessons and providing business support

Vistry Group

Future Homes Standard: what we know so far

Hannah Rapson, Technical Innovation



Integrating renewable technology

Going Electric

Thinking of making the switch to an Electric Vehicle? Many of our new homes which have an associated parking space will have a charging point, which is compatible with any electric vehicle. Meaning if you switch to an Electric Vehicle or already own one, you won't have to worry about installation costs.**

**In some homes where your allocation parking space is in a covered car park the cabling for an EV charger will be laid but no charger will be installed.

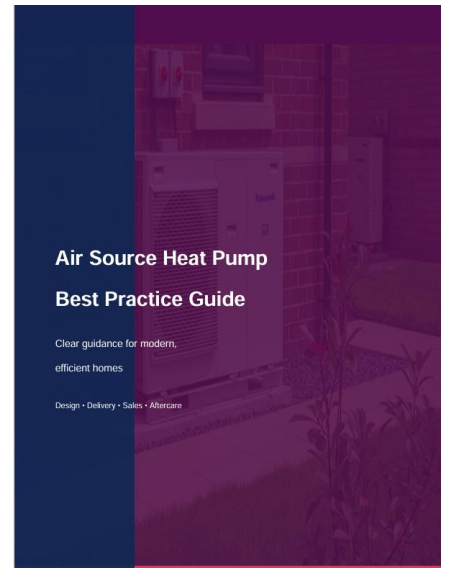
Powered by green energy

Many of our houses enjoy the benefit that sunshine brings with PV solar panels that make your new home less reliant on grid energy, which in turn helps you to reduce your electricity bills. How much you save will depend on your electricity usage vs how much electricity your panels are generating.

What's more if the panels generate more electricity than the home uses then you may be able to sell the energy back to the grid.

Over the next couple of years, we are also increasing our use of renewable energy sources across our developments, so our homes will be less dependent on gas and diesel. Not only that but we are ensuring our current homes are future proofed for our customers. So, if you want to make your home even greener by installing an Air Source Heat pump, the hardware behind the scenes will already be installed in your home.*

*Additional hot water cylinder required upon installation.



Future Homes Standard (Part L 2026)

What we know now

Jack Brayshaw, Director of Research and Innovation

Vistry



Beyond FHS – Learning by doing



WATER EFFICIENT SHOWER

SAVE WATER. SAVE ENERGY. EVERY DAY.

Designed to reduce water usage without compromising performance. Enjoy a powerful, refreshing shower while conserving our most precious resource.

- LOW FLOW RATE**
Uses as little as 6-7 litres per minute vs. standard showers (12-15 L/min)
- WATER SAVING**
Saves up to 50% more water than conventional showers
- HIGH PERFORMANCE**
Advanced nozzle design delivers strong, even water flow
- ENERGY EFFICIENT**
Uses less hot water, reducing energy bills and carbon footprint
- SUSTAINABLE CHOICE**
Better for the environment, better for your home

HOW MUCH CAN YOU SAVE?

UP TO **9,000** LITRES OF WATER PER YEAR*
That's enough to fill **180+** WATER BOTTLES (1.5L)

Small change. Big Impact.
Choose a water efficient shower today.

*Savings based on a family of 4, showering for 8 minutes a day. Actual savings may vary.



An industry-proposed amendment to The Building Regulations 2010

Whole life carbon

INDUSTRY-PROPOSED DOCUMENT

Z

Z1 Carbon assessments

Z2 Carbon intensity

OVERHEATING & COOLING

Creating comfortable, healthy and resilient buildings in a changing climate

WHAT CAUSES OVERHEATING?
Modern buildings can trap heat, especially during hot weather.

- SOLAR GAINS**
Heat from the sun enters through roofs, walls and windows
- INTERNAL HEAT**
Appliances, lighting and occupancy generate heat
- POOR VENTILATION**
Stale air and lack of cool air movement increase indoor temperatures
- HIGH HEAT RETENTION**
Materials that absorb and store heat release it slowly, keeping buildings warm for longer

IMPACTS OF OVERHEATING

- DISCOMFORT**
Poor indoor comfort and disrupted sleep
- HEALTH RISKS**
Heat stress can lead to serious health problems
- REDUCED PRODUCTIVITY**
Harder to concentrate, lower performance at work and school
- HIGHER ENERGY USE**
Increased reliance on mechanical cooling

Overheating is a growing risk due to climate change. Designing buildings to stay cool is essential.

COOLING STRATEGIES
A combination of passive design and efficient systems can keep buildings cool and comfortable.

PASSIVE DESIGN – REDUCE HEAT, IMPROVE COMFORT

- EXTERNAL SHADING**
Use overhangs, louvers, blinds and trees to block direct sun
- NATURAL VENTILATION**
Encourage cross-ventilation and stack effect to remove hot air and bring in cool air
- HIGH PERFORMANCE FABRIC**
Good insulation, low solar gain glazing and airtightness help keep heat out
- GREEN INFRASTRUCTURE**
Trees, green roofs and plants cool the air and reduce the urban heat island effect
- THERMAL MASS**
Use materials that absorb heat during the day and release it at night

EFFICIENT ACTIVE SYSTEMS – WHEN NEEDED

- ENERGY EFFICIENT COOLING**
Use high efficiency systems and set appropriate temperature controls
- HEAT RECOVERY VENTILATION**
Bring in fresh air while recovering cool energy from inside
- SMART CONTROLS**
Use sensors, automation and shading controls to respond to conditions

KEY TAKEAWAYS

- Design early: Consider overheating from the start of the project
- Prioritise passive solutions: They use less energy and work all the time
- Adapt to local climate: Every location is different – design for the future
- Think about people: Comfort, health and wellbeing come first
- Plan for a changing climate: Buildings need to be resilient to hotter summers ahead

Thank you

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Partnerships



Future Homes Standard Technical Conference



Learning by doing



Ross Holleron
Head of Homes and
Construction
Future Homes Hub



Dr Tom Dollard
Partner - Sustainability
and Innovation
Pollard Thomas Edwards



Clifford Elwell
Professor of Building
Physics
University College
London



Adam Tilford
Technical Innovation
Project Manager
Vistry



Future Homes Standard Essentials

Sponsored by **e-on**
next



David Adams

Strategic Advisor

Future Homes Hub



The Future Homes Standard Essentials

Seven actions to de-risk delivery today





User specific guidance - published





Get FHS Ready Webinars and Podcasts

Fridays 1-2pm

Available in Hub members area

Future Homes Standard Reflections

Lead early, learn fast, share lessons

Delivering homes with heat pumps

Build as designed

Prioritize grid availability

Getting heating design right (part 1)

19 June

Getting heating design right (part 2)

3 July

Commission with care

10 July

Own the customer journey

17 July

Evolve your design

September

Ventilation in New Homes

October





Thank you

Save the date

Future Homes Annual Conference on 2nd December



Be sure to share your experience on LinkedIn using #FHSready



Drinks Reception
5-6pm

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