furbnow

Build Pack: 14 Maple Avenue, Harrogate, HG1 4RJ

Ref MA001 · Prepared May 2026



LOWER BILLS	WARMER HOME	HEALTHY AIR	EPC IMPROVEMENT
~£1,450/yr	No cold walls or draughts	dMEV in wet rooms	E → A

Where things stand

Your home is a 1930s semi-detached house in Harrogate, built with solid brick walls (225mm) and a timber ground floor over a ventilated void. The loft has some insulation but only around 100mm — below current standards, with gaps at the eaves. The property is heated by a gas combi boiler installed in 2018. Total floor area is approximately 120 m².

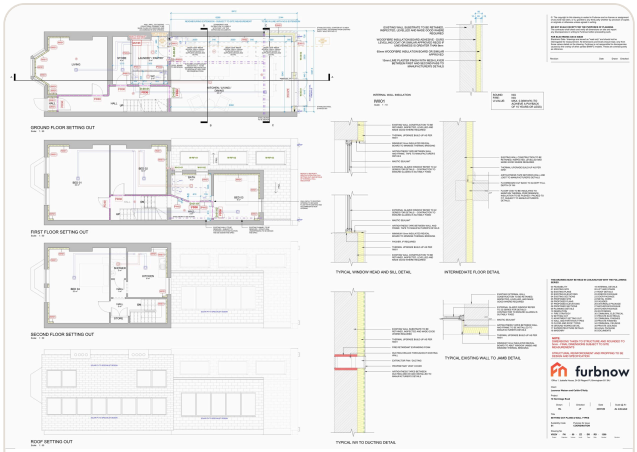
The main issues you have raised are high energy bills, cold rooms during winter — particularly the ground floor and north-facing bedrooms — and draughts from the original windows and front door. There is no mechanical ventilation; the building relies on natural infiltration through gaps in the fabric, which contributes to the heat loss.

The priority for this phase is the thermal envelope: internal wall insulation, window and door replacement, and loft top-up. As the envelope tightens, decentralised mechanical extract ventilation (dMEV) is needed to maintain air quality and manage condensation risk. These four measures are interdependent and must be sequenced correctly — this Build Pack sets out that sequence.

Survey floor plans



Survey floor plan



Annotated survey plan

Your upgrades at a glance

Measure	Area / size / quantity	Specification	Target start
Windows & Doors	—	Minimum whole-window U-value of 1.4 W/m²K. Triple glazing recommended for north-facing elevations. All frames to achieve at least Window Energy Rating Band B. Product selection confirmed by the appointed installer to these performance standards.	—
Internal Wall Insulation	—	Minimum U-value of 0.30 W/m²K post-installation. BBA-certified system required. All penetrations sealed to maintain airtightness. Junctions designed to avoid thermal bridging. We specify either the IWI Pro mineral wool system or the K Systems M mineral wool system (BBA-certified, A1-rated). System selection confirmed at specification stage.	—
Loft Insulation Top-Up	—	Minimum total depth of 300mm. We specify Knauf Earthwool Loft Roll 44 (glass mineral wool, 0.044 W/mK, Euroclass A1, BS EN 13162). Second layer laid perpendicular to joists to eliminate thermal bridging. Eaves vents maintained where required for roof ventilation.	—
dMEV — Decentralised Mechanical Extract Ventilation	—	Continuous extract rates to Approved Document F, with humidity-controlled boost in every wet room. Units specified from Nuaire, Vent-Axia, or Aereco. Rigid duct to outside, insulated where it crosses unheated space. Make-up air through trickle vents in every habitable room, and internal doors undercut by 10mm so air can reach the wet rooms. Each fan wired to a permanent live through a fused isolator, not the light switch.	—
Air Source Heat Pump	—	Monobloc system from Vaillant, Mitsubishi Ecodan, or Daikin Altherma. EN 14825 SCOP ≥ 3.5 at flow temperature 45°C against the post-retrofit design heat load. R290 refrigerant preferred where available. Cylinder minimum 180 L with ErP class B or better. Weather compensation enabled at commissioning.	—
Solar PV & Battery	—	Modules: tier-1 monocrystalline, ≥ 410 W per panel, 25-year product warranty. Inverter and optimisers: SolarEdge per the attached system design. Battery: minimum 10-year warranty, ≥ 6,000 full cycles. Roof fixings rated to local wind load; no fixings through any insulation layer added under the IWI or loft works.	—

Measures in detail

Windows & Doors

£14,000–£19,000

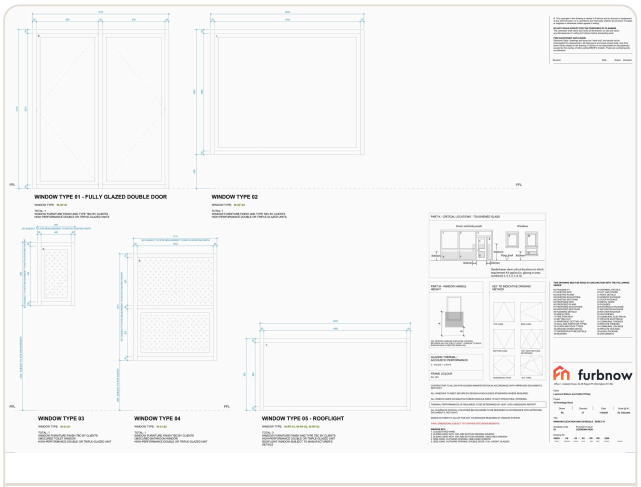
0% VAT

CURRENT SITUATION

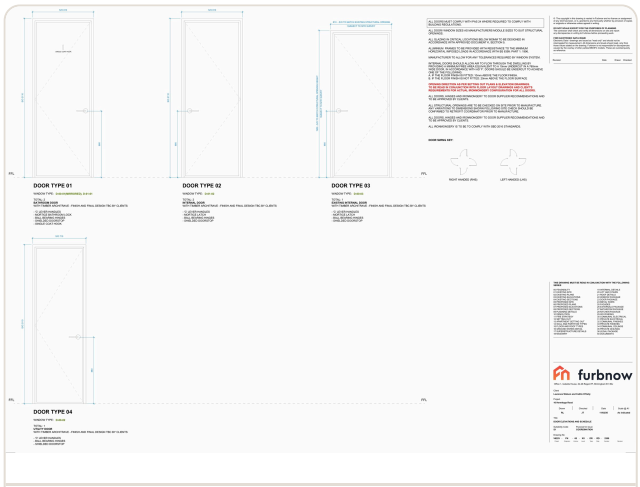
Eliminates draughts and the heat loss from original single-glazed windows and poorly sealed frames — and must be installed before IWI

SUGGESTED APPROACH

Full replacement with high-performance double or triple glazing and insulated door sets



Windows detail — elevations and schedule for the replacement units.



Doors — elevations and schedule for the replacement door sets.

WHAT IS INCLUDED

- Full window replacement throughout
- Front and rear door replacement with insulated door sets
- All frames installed before IWI commences

FURBNOW SPECIFICATION

Minimum whole-window U-value of 1.4 W/m²K. Triple glazing recommended for north-facing elevations. All frames to achieve at least Window Energy Rating Band B. Product selection confirmed by the appointed installer to these performance standards.

WHAT WE ARE LOOKING FOR

- Minimum U-value 1.4 W/m²K whole window, triple glazing on north elevations
- Frames installed before IWI so insulation dresses around the outer frame

INSTALLER REQUIREMENTS

FENSA or CERTASS registered installer required for all glazing replacement. This is a legal requirement for replacing windows in England and Wales. The installer will issue a certificate of compliance on completion.

WHAT TO AVOID

- Windows installed after IWI — this creates a cold bridge at the reveal
- Windows ordered without trickle vents — they supply the dMEV's make-up air

Internal Wall Insulation

£12,000–£16,000

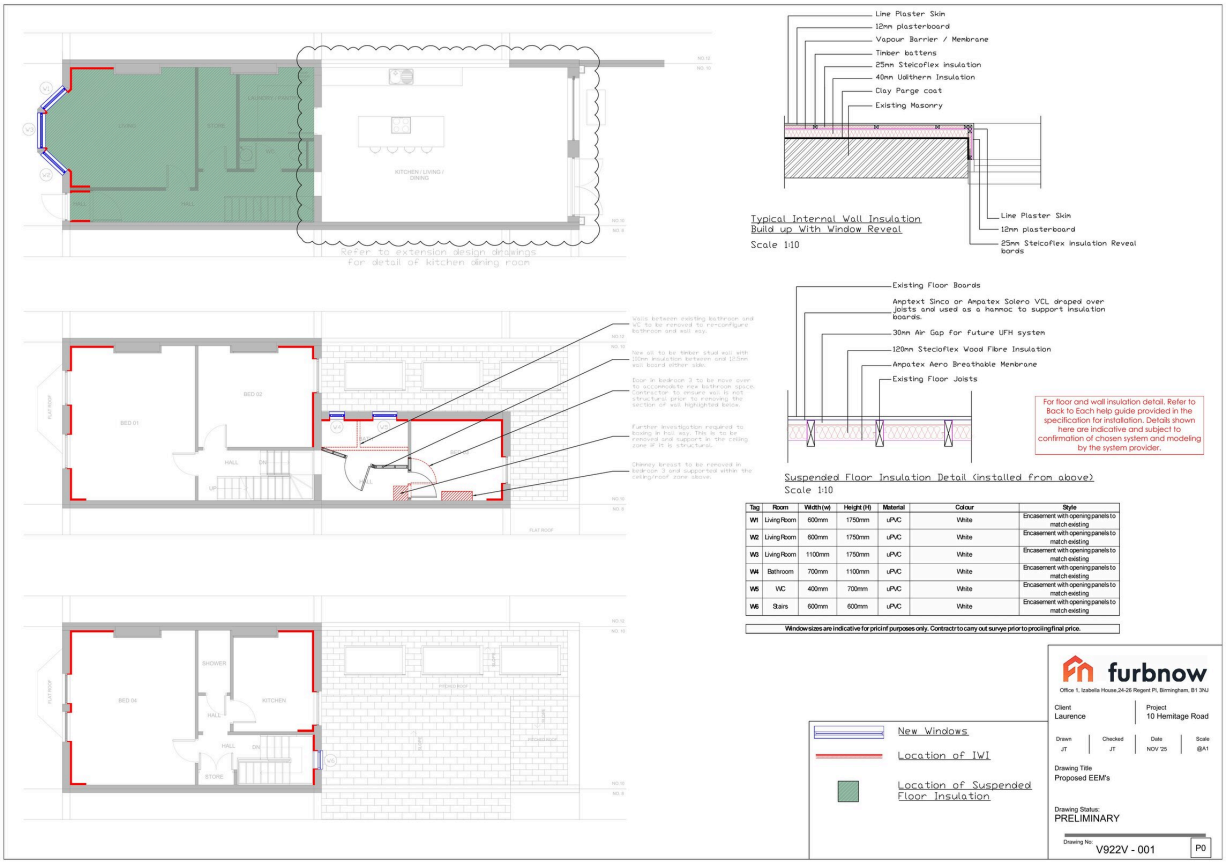
0% VAT

CURRENT SITUATION

Eliminates heat loss through solid brick walls — the single largest source of heat loss in this property

SUGGESTED APPROACH

Mineral wool board system installed internally, finished with plasterboard and skim



Annotated plan — wall insulation positions called out across the ground floor, with junction notes and key dimensions.

WHAT IS INCLUDED

- Internal mineral wool insulation board, 120mm minimum
- Reinforced base coat and plaster finish
- All window reveals, sills, and eaves detailing

FURBNOW SPECIFICATION

Minimum U-value of 0.30 W/m²K post-installation. BBA-certified system required. All penetrations sealed to maintain airtightness. Junctions designed to avoid thermal bridging. We specify either the IWI Pro mineral wool system or the K Systems M mineral wool system (BBA-certified, A1-rated). System selection confirmed at specification stage.

WHAT WE ARE LOOKING FOR

- BBA-certified mineral wool board system (IWI Pro or K Systems M)
- Continuous insulation at all junctions including around window openings

INSTALLER REQUIREMENTS

Installer must hold relevant accreditation for internally insulated systems and carry appropriate liability insurance. System manufacturer approval and training certification required.

WHAT TO AVOID

- EPS as the primary insulation layer where mineral wool is achievable
- Bridged or discontinuous insulation at eaves or window reveals

Loft Insulation Top-Up

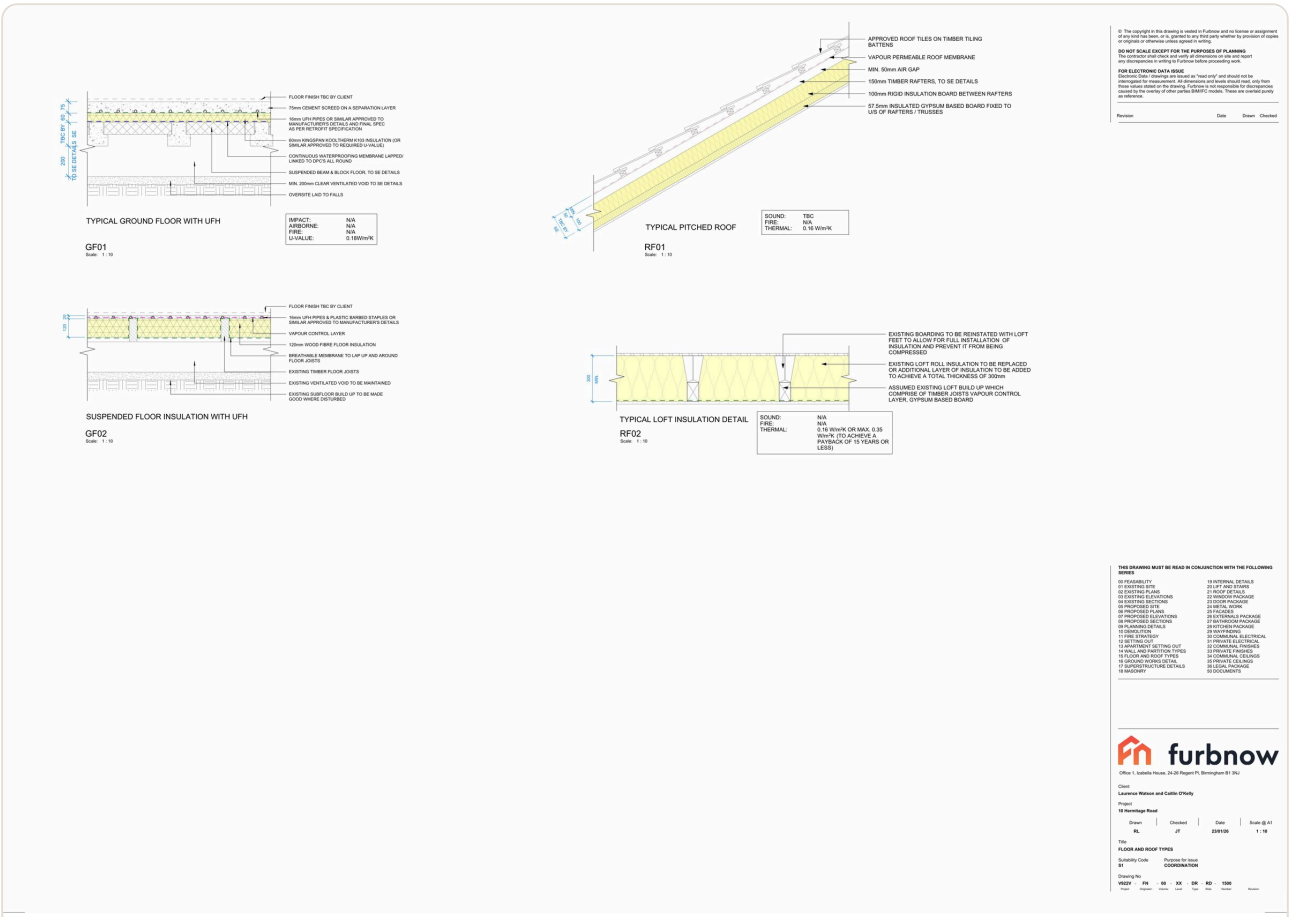
£700–£1,000
0% VAT

CURRENT SITUATION

Brings loft insulation up to current standard — quick, low-cost, and completes the thermal envelope

SUGGESTED APPROACH

Top-up from 100mm to 300mm using mineral wool; eaves sealed



Loft top-up — 300mm mineral wool laid between and over joists, with eaves ventilation maintained and access walkway preserved.

WHAT IS INCLUDED

- Top-up from 100mm to 300mm total depth
- Eaves sealing to prevent cold air infiltration
- Tank and pipework lagging in the loft if present

FURBNOW SPECIFICATION

Minimum total depth of 300mm. We specify Knauf Earthwool Loft Roll 44 (glass mineral wool, 0.044 W/mK, Euroclass A1, BS EN 13162). Second layer laid perpendicular to joists to eliminate thermal bridging. Eaves vents maintained where required for roof ventilation.

WHAT WE ARE LOOKING FOR

- 300mm total depth, second layer perpendicular to joists
- Eaves sealed against cold air infiltration

INSTALLER REQUIREMENTS

Installer must be registered with the relevant accreditation schemes. Our vetted specialist installers carry appropriate insurance and references for this type of work.

WHAT TO AVOID

- Top-up layer running parallel to existing without a perpendicular cross-layer
- Blocking of roof ventilation vents

dMEV — Decentralised Mechanical Extract Ventilation

~£2,500–£3,500
0% VAT

CURRENT SITUATION

Keeps air quality and condensation under control once the envelope is sealed — essential after IWI and window replacement

SUGGESTED APPROACH

Continuous extract fans in each wet room that boost automatically on humidity; fresh air through window trickle vents

WHAT IS INCLUDED

- Continuous extract fans in the kitchen, bathroom, en-suite, and utility
- Continuous low-speed running with automatic humidity boost
- Trickle vents in every habitable room, supplied with the replacement windows
- Commissioning, with measured flow rates recorded

FURBNOW SPECIFICATION

Continuous extract rates to Approved Document F, with humidity-controlled boost in every wet room. Units specified from Nuaire, Vent-Axia, or Aereco. Rigid duct to outside, insulated where it crosses unheated space. Make-up air through trickle vents in every habitable room, and internal doors undercut by 10mm so air can reach the wet rooms. Each fan wired to a permanent live through a fused isolator, not the light switch.

WHAT WE ARE LOOKING FOR

- Humidity-controlled continuous extract in every wet room
- Units: Nuaire, Vent-Axia, or Aereco

INSTALLER REQUIREMENTS

Installer registered with a competent person scheme for ventilation. Flow rates must be measured at commissioning and the results handed over to the homeowner and Building Control, as Approved Document F requires.

WHAT TO AVOID

- Intermittent on/off fans in place of continuous extract
- Internal doors without an undercut, which starve the wet rooms of air

Air Source Heat Pump

£10,000–£14,000

0% VAT

CURRENT SITUATION

Replaces the end-of-warranty gas combi with a low-carbon heating system, sized correctly against the reduced post-retrofit heat load

SUGGESTED APPROACH

MCS-designed monobloc ASHP, hot water cylinder, and emitter upgrades where required for low-flow operation

WHAT IS INCLUDED

- MCS heat-pump design package against post-retrofit heat load
- Monobloc outdoor unit, indoor hydraulic kit, and hot water cylinder sized to household demand
- Emitter survey and upgrade of undersized radiators for low-flow operation
- Commissioning, weather compensation setup, and BUS grant administration

FURBNOW SPECIFICATION

Monobloc system from Vaillant, Mitsubishi Ecodan, or Daikin Altherma. EN 14825 SCOP ≥ 3.5 at flow temperature 45°C against the post-retrofit design heat load. R290 refrigerant preferred where available. Cylinder minimum 180 L with ErP class B or better. Weather compensation enabled at commissioning.

WHAT WE ARE LOOKING FOR

- Flow temperature ≤ 45°C at design outdoor temperature; emitters upsized where needed to achieve this
- Heat-loss recalculation against the post-IWI fabric, not the existing baseline
- Gas supply capped at meter once commissioning is complete

INSTALLER REQUIREMENTS

MCS-certified heat pump installer required to release the Boiler Upgrade Scheme grant (currently £7,500 toward the install). The installer must produce a full MCS-compliant design package; this is not a quote-from-photos job. The Heat Loss Estimator Report is provided as background only — the formal MCS heat-loss calculation is part of the installer's design scope.

WHAT TO AVOID

- Hybrid bivalent systems that retain the gas boiler as supplementary heat
- Sizing taken from a rule-of-thumb floor-area calculation rather than a full room-by-room MCS heat-loss survey
- Flow temperatures above 50°C at design outdoor temperature

Solar PV & Battery

£10,000–£13,000
0% VAT

CURRENT SITUATION

Generates clean electricity on-site to offset the ASHP's running cost and provide resilience through battery storage

SUGGESTED APPROACH

~4 kWp panel array with per-module optimisation and a ~5 kWh battery, per the SolarEdge system design

WHAT IS INCLUDED

- ~4 kWp panel array on south- and east-facing roof pitches per attached design
- SolarEdge inverter with per-module optimisers
- ~5 kWh AC-coupled battery storage, EV-ready
- DNO G98/G99 notification, MCS certificate, and SEG registration

FURBNOW SPECIFICATION

Modules: tier-1 monocrystalline, ≥ 410 W per panel, 25-year product warranty. Inverter and optimisers: SolarEdge per the attached system design. Battery: minimum 10-year warranty, ≥ 6,000 full cycles. Roof fixings rated to local wind load; no fixings through any insulation layer added under the IWI or loft works.

WHAT WE ARE LOOKING FOR

- Per-module optimisers (not a plain string inverter) to manage the morning shading on the east pitch
- Battery sized against the post-ASHP evening load, not generic household averages
- Installer handles all DNO and SEG paperwork end-to-end

INSTALLER REQUIREMENTS

MCS-certified PV installer required for both the array and battery to qualify for 0% VAT and SEG export payments. The installer handles G98/G99 notification with the Distribution Network Operator before commissioning. Confirmation of available grid capacity is required given the ASHP load also added under the heat-pump measure.

WHAT TO AVOID

- String inverters without per-panel optimisation, given partial shading on this roof
- Fixings penetrating IWI or new loft insulation without proper detailing
- Batteries with warranties under 10 years or below 6,000 cycles

Sequencing & timescales

These measures are sequenced to work together. Windows and doors are installed first so the IWI system can be dressed around the frames correctly, bringing them within the insulation layer. The loft top-up completes the envelope. dMEV follows once the envelope is sealed. Heating is then switched from the gas combi to an air source heat pump, and a roof-mounted solar PV array with battery storage is installed last.

1. ### Windows & Doors
   Installed before IWI commences. Lead time of 6-10 weeks from order. Full-house replacement typically over 2-4 days depending on number of openings and access.
   2-4 days

2. ### Internal Wall Insulation
   Scaffold required. Site needs to be clear of obstructions at the external perimeter. No internal access required during main works. IWI dressed around the installed window frames.
   2-3 weeks

3. ### Loft Insulation Top-Up
   Can be carried out alongside IWI. Loft access required; typically completed in one day.
   1 day

4. ### dMEV
   Fitted after the airtightness re-test. Typically 1-2 days, with a short duct run to outside from each wet room. Flow rates are measured and recorded at commissioning.
   1-2 days

5. ### Air Source Heat Pump
   Post-retrofit MCS heat-loss design (1-2 weeks) followed by install. Outdoor unit, cylinder, emitter upgrades and commissioning typically 2-3 days. Gas supply capped at the meter on completion.
   2-3 days

6. ### Solar PV & Battery
   Array, inverter, and battery install typically 1-2 days. DNO G98/G99 paperwork submitted by the installer; commissioning once approval is received.
   1-2 days

What to budget

These are indicative estimates based on our experience of similar projects and current market data. We will firm up all costs with our vetted specialist installers before you commit to anything — these figures are here to help you plan and prioritise, not to replace a formal quotation.

Windows & Doors	£14,000–£19,000	Internal Wall Insulation	£12,000–£16,000
Loft Insulation Top-Up	£700–£1,000	dMEV — Decentralised Mechanical Extract Ventilation	~£2,500–£3,500
Air Source Heat Pump	£10,000–£14,000	Solar PV & Battery	£10,000–£13,000

Estimated total project cost **£49,000–£67,000**

VAT: Most energy efficiency measures are 0% rated for VAT under HMRC VAT Notice 708/6. Where any element of work falls outside the relief — for example, certain structural or decorative works — this will be clearly identified in formal quotations. We do not apply a blanket 20% assumption.

BUS grant: The £7,500 Boiler Upgrade Scheme grant toward the ASHP is not netted off the figures above — the installer applies on your behalf and the grant is paid directly to them, reducing your bill at the point of install.

The difference this makes

Projections are based on current energy tariffs and SAP/RdSAP modelling. Actual savings depend on occupancy and how the heating is used.

Energy savings

~£1,900/yr

estimated annual saving

Heating & hot water (gas displaced)	~£1,300
PV self-consumption & SEG export	~£600
Solar generation	~3,600 kWh/yr
CO_2 reduction	~4.3 tonnes/yr

EPC improvement

E → A

from 42 to approximately 92 points

Current EPC	E (42)
Projected EPC	A (92)

Savings projections are indicative. Final figures will be confirmed once formal quotations are received and a full SAP calculation is completed. Energy prices used: October 2024 Ofgem price cap (gas 5.48p/kWh, electricity 24.50p/kWh). Once the ASHP is in, heating costs sit on the electricity tariff only; the gas standing charge falls away.

A few things to verify

1. External wall area — measured survey required
   The IWI cost estimate is based on an approximate wall area. A surveyor will measure the property precisely before quotations are issued. Gables, bay windows, and any existing attached structures will affect the final area.
   ACTION: FURBNOW TO ARRANGE AT SURVEY

2. Planning permission — IWI on a semi-detached property
   IWI on a semi-detached house in England does not typically require planning permission under permitted development, but the local authority should be consulted. Conservation area status and any Article 4 directions need to be confirmed for this address.
   ACTION: FURBNOW TO CHECK WITH NORTH YORKSHIRE COUNCIL PRIOR TO SPECIFICATION

3. Current airtightness — baseline test recommended
   No airtightness test result is available for this property. A baseline test before works begin is recommended to confirm the current infiltration rate. A re-test after windows and IWI are complete confirms continuous extract suits the sealed envelope.
   ACTION: FURBNOW TO ARRANGE BASELINE BLOWER DOOR TEST

4. Loft access and obstructions
   Access hatch size and any obstructions (tanks, pipework, stored items) need confirming at survey. If the hatch needs enlarging, this will be noted in the quotation.
   ACTION: CONFIRMED AT SURVEY

5. Heat-loss recalculation against post-IWI fabric
   The attached Heat Loss Estimator Report is a pre-retrofit baseline (external walls 1.64 W/m²K). The MCS heat pump design must be redone against the post-IWI U-values once the fabric specification is firm, so the ASHP is not oversized.
   ACTION: MCS INSTALLER TO PRODUCE DESIGN AFTER IWI SPECIFICATION IS SIGNED OFF

6. DNO capacity for ASHP plus PV
   Combined ASHP load and PV export need Distribution Network Operator confirmation. Notification under G98 or G99 (depending on system size) is handled by the PV installer, but capacity should be confirmed before formal quotations.
   ACTION: PV INSTALLER TO CONFIRM WITH NORTHERN POWERGRID

Design files & technical documents

- Survey Floor Plan — Ground and first floor survey plans recorded on site.
- Annotated Survey Floor Plan — Survey plans with key dimensions, junctions and existing-build notes.
- Annotated Plan — Measure Positions — Plan showing where each proposed measure sits in the property.
- Windows Detail — Elevations and schedule for replacement window units.
- Doors Elevations & Schedule — Elevations and schedule for replacement door sets.
- Floor, Loft & Roof Insulation Detail — Build-up sections for floor, loft and roof insulation.
- Heat Loss Estimator Report — Pre-retrofit baseline heat-loss report — input for the ASHP sizing exercise once IWI U-values are confirmed.
- Solar & Battery System Design — SolarEdge system design with proposed panel layout and string design.
- Air Permeability Test Certificate (baseline) — Baseline Elmhurst airtightness certificate, 9.80 m³/(h·m²) @ 50Pa.
- dMEV Commissioning Record PENDING — Measured extract flow rates for each wet room, recorded at commissioning.
- ASHP MCS Design Package PENDING — Full MCS heat-loss recalculation, system schematic and emitter schedule, produced once IWI U-values are confirmed.
- Boiler Upgrade Scheme application PENDING — £7,500 BUS grant application submitted by the MCS installer on your behalf.

- DNO G98/G99 confirmation PENDING — Confirmation from Northern Powergrid that the property has capacity for the proposed ASHP load and PV export.
- Solar PV MCS & SEG certificates PENDING — MCS certificate, commissioning report, and SEG export registration for the PV array and battery.
- Post-Installation EPC PENDING — Updated EPC to be lodged once all measures are complete.

WHAT HAPPENS NOW

Ready to move forward?

Questions, or want to talk something through first? Email hello@furbnow.com.

Extra Floor Plans - For Scribbling

Survey floor plan



Extra Floor Plans - For Scribbling

Annotated survey plan

