

Cleantech for UK Response

Warm Homes Fund: Call for Evidence

June 2026

About Cleantech for UK

Cleantech for UK is a policy advocacy initiative representing a coalition of clean technology innovators, scale-up companies and investors working to ensure that the UK is the most competitive place to start, scale and retain high-growth clean technology businesses.

Our members operate at the forefront of capital-intensive innovation in sectors central to the UK's energy security, economic resilience and net zero ambitions. The coalition spans businesses across agriculture and food systems, energy and power, materials and chemicals, transport and logistics, waste and recycling, and environmental management. Many are developing and commercialising technologies that require domestic manufacturing capacity, demonstration facilities and large-scale infrastructure deployment where specialist capital is required. We represent investors across the full capital stack, including those deploying venture, growth and infrastructure capital into UK-based projects.

Clean technologies are products, services and business models that deliver measurable environmental benefits, including emissions reduction, waste minimisation and improved resource efficiency, while generating competitive economic returns.

Introduction

Our submission focuses on the sections of the CfE most directly relevant to our coalition members: the strategic case for government equity investment, the finance gap for innovative and first-of-a-kind cleantech deployments, and the conditions required to unlock private capital at scale. We do not respond to sections where we lack direct operational experience, including landlord finance, local government investment models, and heat network delivery.

We submit this response at a moment of acute political importance for the clean energy transition. At a time when the electorate is struggling to see how policy decisions translate into tangible improvements in their economic wellbeing, the Warm Homes Fund has an opportunity that few policy instruments possess: to put money directly back in people's pockets. Technologies that cut household energy bills are not simply a climate intervention; they are a cost-of-living intervention. Designing the Fund with that political reality at its centre, backing accessible, affordable cleantech innovations and ensuring the benefits reach households beyond the top income quartile, is not just good economics. It is the condition on which public consent for the clean energy transition will ultimately depend.

The government's Clean Power 2030 ambition sets an important and welcome direction of travel, but generation alone will not deliver the transition. The missing link is the consumer-facing layer: the networks that can flex and respond, and the appliances and products that allow households to participate actively in a smarter energy system. Accelerating innovation in both, while anchoring the intellectual property and manufacturing capability in the UK, must be central to how the Warm Homes Fund deploys its capital.

This response addresses questions 1, 2, 3, 5 and 6 (Section 1), questions 15 and 16 (Section 2A), and questions 53 to 56 (Section 2E). We also provide brief input on questions 40 to 42 (Section 2D) where relevant to our members. Questions not addressed fall outside our direct area of expertise.

Our Recommendations

On the basis of the evidence and arguments set out in this response, Cleantech for UK urges government to adopt the following specific measures in the design of the Warm Homes Fund.

1. Establish a dedicated growth equity co-investment facility within the Fund

Allocate a defined tranche of the £3.3 billion innovative finance envelope specifically for minority equity co-investments in UK-based, growth-stage cleantech manufacturers and innovative delivery model companies. The facility should operate alongside private lead investors, with delegated authority to an investment committee and a fast-track approval pathway (maximum nine months from application to close) for investments below £25 million.

2. Reduce VAT to 0% on early stage cleantech products eligible under the Fund

Extend the existing 0% VAT treatment for energy-saving materials to cover a defined list of early-stage cleantech products supported through the Warm Homes Fund, including heat batteries, demand flexibility platforms and advanced insulation systems, and plug-and-play domestic energy devices. This would reduce the consumer cost barrier directly, without grant subsidy, and bring these products in line with the treatment already applied to solar panels, heat pumps and insulation materials under existing HMRC schedules.

3. Rebalance grant support away from heat pumps toward a broader cleantech basket

Rather than concentrating demand-side grant support through the Boiler Upgrade Scheme on a single technology that remains unaffordable for most households without additional intervention, redistribute support across three to four accessible cleantech innovations, including heat batteries, electric boilers, solar-plus-storage, stand-alone storage, demand flexibility services and advanced fabric measures. This rebalancing should be reflected explicitly in the Fund's investment criteria and the BUS review currently under way.

4. Legislate long-term demand signals to underpin Fund investment decisions

Place the Clean Heat Market Mechanism, the Future Homes Standard trajectory and grid connection timelines for domestic LCT installations on a primary legislative footing before the Fund begins deploying equity. Without this, the revenue projections of Fund investees will remain too uncertain to attract private co-investment at the required scale.

5. Mandate an additionality test and publish an annual portfolio return target

Require all equity investments from the Fund to pass a formal additionality assessment, demonstrating that the investment addresses a genuine market failure not being met by available private capital. Publish a target portfolio-level financial return (net of losses) at Fund launch and report against it annually to Parliament.

6. Build verified outcome measurement and revenue recycling into the Fund

Fund should require investees and supported programmes to measure energy, carbon and bill outcomes using transparent, auditable methodologies. Where additional and robustly verified emissions reductions can be generated, the Fund should allow appropriate revenue mechanisms, including high-integrity voluntary carbon or verified outcome units, with proceeds ring-fenced to reduce customer costs, recycle into further retrofits, or improve the Fund's portfolio return. This would help turn one-off public expenditure into a measurable, revenue-generating and continuously improving programme.

Section 1: Strategic Case, Aims and Scope

Question 1: Do you agree with our assessment of the strategic opportunities, challenges and risks presented by warm homes financial transactions?

Cleantech for UK broadly agrees with DESNZ's assessment and welcomes the recognition that government finance must complement, not displace, private capital. However, we believe the CfE understates two structural challenges that are particularly acute for innovative cleantech companies, particularly those that are hardware-based, and no doubt critical to the decarbonisation of homes: the risk appetite gap in early-stage equity markets, and the compounding effect of policy uncertainty on private investment decisions.

On the areas of agreement, the identification of upfront cost as the primary demand-side barrier is well-evidenced and consistent with our members' experience. The National Home Energy Survey 2024 (DESNZ) found that 48% of people report upfront cost as a barrier to investing in renewable energy. The framing of the Fund as a vehicle to de-risk the sector and demonstrate investability, rather than simply subsidise deployment, is the right strategic approach. The reference to KfW in Germany is instructive: low-cost, long-term lending has been a material factor in accelerating Germany's heat pump and solar deployment, and the UK needs an equivalent signal.

Where we believe the assessment needs strengthening, two issues stand out. First, the CfE frames the finance gap primarily as a consumer demand problem, but for innovative and first-of-a-kind cleantech technologies, the more acute gap is on the supply side. The Climate Change Committee's Seventh Carbon Budget (2025) identifies supply chain constraints, not demand, as the binding constraint on the pace of domestic heat decarbonisation. Private venture capital typically exits at Series B or C, while infrastructure investors require bankable revenue streams that early-stage deployment cannot yet guarantee. Government equity can bridge this gap in a way that loans cannot.

The assessment should also recognise a third structural challenge: the current weakness of verified outcome data. Many retrofit propositions can demonstrate modelled savings, but investors, lenders and public bodies often lack standardised, auditable evidence of actual post-installation performance across portfolios. This limits confidence in the asset class and prevents the creation of repeatable financing structures. The Fund should therefore treat measurement and verification infrastructure as core market-enabling capability, not an optional reporting layer.

Second, while policy uncertainty is cited as a background condition, its scale is underweighted. Several of our members report that the single largest barrier to private co-investment is not the cost of capital but the absence of long-term demand signals. The Warm Homes Fund will be

most effective if it is accompanied by durable policy commitments on standards, grid connection timelines and market access.

Accommodating pre-revenue cleantech equity within the Financial Transactions Control Framework

The reforms to the fiscal framework announced at Autumn Budget 2024, specifically the shift to targeting Public Sector Net Financial Liabilities (PSNFL), represent a significant and welcome enabler for the Warm Homes Fund. By allowing government equity investments and loans to be recognised as financial assets that offset the associated liability, the framework creates the conditions for patient, strategic public capital deployment without placing upward pressure on measured debt. Structured correctly, the Warm Homes Fund is well-placed to deploy public capital at the stage where it can credibly crowd in private investment at scale.

Many of the most strategically significant cleantech investments will be made in companies that are pre-revenue at the point of investment. Conventional asset valuation methodologies, based on revenue multiples or discounted cash flows, are ill-suited to this stage of development. This does not mean such investments lack genuine asset value: intellectual property, patents, exclusive licensing rights and the sovereign value of retaining British cleantech capability constitute a credible and defensible asset base. The US ARPA-E model demonstrates that structured public investment into pre-revenue clean technology, anchored in rigorous assessment of technology readiness, IP position and market potential, can generate substantial strategic and economic returns while advancing technologies through the commercialisation pipeline that private markets would not otherwise fund.

The Financial Transactions Control Framework should explicitly accommodate a bespoke valuation methodology for pre-revenue cleantech equity on this basis. Staged investment structures, with smaller initial equity stakes and contractual follow-on rights, offer a further mechanism to manage fiscal risk while keeping early-stage companies within scope. Without such provisions, the framework risks reproducing the precise market failure, the so-called valley of death, that public investment at this stage is uniquely positioned to address.

Question 2: What evidence is there on the factors that most significantly limit the uptake of green finance?

Based on structured engagement with our coalition, we identify four principal barriers to green finance uptake for innovative cleantech companies, presented in approximate order of impact.

The most significant is the absence of patient equity for commercial-scale deployment. Venture capital typically exits before companies reach the commercial volumes needed to attract infrastructure or project finance, creating a valley of death between Series B funding and bankable revenue. This is particularly pronounced in hardware-intensive cleantech, including heat pumps, battery storage systems and grid-edge technology, where capital requirements are high and revenue ramp-up is slower than in software businesses. The British Business Bank's Small Business Finance Markets Report 2024-25 confirms that growth-stage hardware businesses consistently report equity as their most critical unmet financing need.

Closely related is the mismatch between private lender risk models and cleantech project profiles. Commercial lenders apply credit frameworks built for established asset classes, meaning that first-of-a-kind technology deployments, even where the underlying science is proven, are typically rated as speculative and attract interest rates that render projects commercially unviable. Government finance, priced at or near gilt rate, can change this calculus materially.

Third, policy-driven demand uncertainty has a direct and measurable effect on private investment decisions. Multiple members report that investors have explicitly cited policy instability as a reason to delay or decline co-investment. The Boiler Upgrade Scheme, while valuable, has been subject to repeated changes in funding levels and eligibility, and investors price this uncertainty into their required returns, raising the cost of capital across the sector. The NAO's 2024 report on low-carbon heating identified policy inconsistency as a primary contributor to the underperformance of domestic heat decarbonisation programmes relative to target.

Finally, for consumer-facing products, low awareness of available finance and limited trust in newer technology providers remain genuine barriers, particularly outside major urban centres. This is consistent with DESNZ's National Home Energy Survey findings (2024) and the Green Home Finance state of the market review.

Question 3: What wider loan or equity-based interventions in the warm homes market could unlock demand at scale?

We propose three complementary interventions, each targeting a distinct point of market failure.

The most pressing need is for a dedicated equity co-investment facility for scaling cleantech companies, structured as a matched mechanism alongside private investors. This is distinct from consumer lending: it targets the supply side, enabling UK cleantech companies to scale manufacturing, reduce unit costs, and reach the commercial volumes that make downstream deployment investable. The National Wealth Fund and Great British Energy are natural delivery partners for this function, but the Warm Homes Fund can provide the initial risk capital that neither is currently positioned to deploy at early stage.

Where government equity is not the appropriate instrument, first-loss guarantee structures for project finance offer an effective alternative. By covering the first 10 to 15% of losses, such guarantees can reduce private sector risk perception sufficiently to unlock lending at commercial rates. This is the model used effectively by the Green Investment Bank prior to its privatisation, and by the European Investment Bank across EU member states. It generates a return for government through guarantee fees while mobilising a multiple of private capital, a more efficient use of public resource than direct subsidy.

A third intervention would be a verified-outcomes finance facility. Under this model, supported retrofit programmes would report actual energy, bill and emissions reductions against consistent baselines. Where performance is independently verified, a portion of the verified value could be monetised through outcome payments, performance-linked interest reductions or high-integrity carbon revenues. This would reward delivery rather than forecast savings and would give government a clearer basis for comparing interventions across heat, fabric, flexibility and storage.

Both interventions, however, will be significantly undermined if policy signals remain uncertain. Finance alone will not unlock demand at scale. Our members consistently report that a credible, long-term trajectory for standards, grid connection timelines and market access, backed by primary legislation where possible, is worth more to private investors than any single financing facility. The Warm Homes Fund should therefore be designed as part of a broader, stable policy architecture, not as a substitute for one.

Question 5: Do you agree with the proposed overarching aims of the Warm Homes Fund?

Yes. Cleantech for UK broadly agrees with the proposed overarching aims of the Warm Homes Fund and welcomes the framing of the Fund as a supply-chain and market-building instrument rather than a pure demand subsidy. We offer the following observations to strengthen and clarify the aims as they are finalised.

What the aims get right

The dual focus on bill reduction and decarbonisation reflects the reality that these objectives are, in the main, complementary rather than in tension. Heat pumps, insulation and solar PV simultaneously reduce energy demand, lower bills and cut emissions. Framing the Fund around both outcomes helps prevent it from being captured by a single policy priority at the expense of the other.

The explicit reference to supporting the supply chain through loans and equity signals an understanding that the barrier to scale in the UK is not primarily consumer demand, but the absence of a mature, well-capitalised domestic industry capable of delivering at pace. Our members, many of whom are scaling manufacturing and installation capacity, are precisely the kind of enterprises this instrument should be designed to support. The UK currently imports the majority of its heat pump units: DESNZ's Heat Pump Investment Accelerator prospectus (2024) acknowledges that domestic manufacturing capacity has not kept pace with deployment ambition, and the CCC's Progress Report 2024 identifies supply chain development as a prerequisite for hitting 2030 installation targets.

The aims also correctly identify cost reduction as a mechanism, not just an outcome. Loans and equity that help supply-chain businesses grow to scale will, over time, bring down unit costs through learning-by-doing and economies of scale, benefiting consumers and the public finances alike.

Where the aims could be strengthened

The current draft aim is relatively narrow in its focus on the supply chain and deployment of technologies. We would suggest three additions or clarifications.

First, the aims should explicitly reference innovation. The Fund should not only scale existing technologies but should actively support the commercialisation of next-generation products, including emerging heat pump designs, demand-side flexibility platforms and energy-as-a-service models. Without an explicit innovation mandate, there is a risk that the Fund defaults to backing only incumbent technologies and established players.

The aims should also explicitly reference verified outcomes. A Fund of this scale should not only deploy capital; it should create a transparent evidence base showing which technologies and delivery models produce the greatest energy, carbon, health and bill impacts. This would support annual accountability to Parliament, improve future policy design and make the portfolio more investable for private capital.

Second, the aims should reference market development alongside technology deployment. Several of our members operate in nascent market segments where the absence of customer trust, standardised contracts and regulatory clarity is as much of a barrier as the absence of finance. The Fund has an opportunity to catalyse market development in these segments, but only if that is articulated as part of its purpose.

Third, the overarching aims make no reference to economic geography or the distribution of benefits. If the Fund is to contribute to levelling up as well as decarbonisation, that objective should be made explicit and reflected in investment criteria.

We urge government to treat the aims as a floor rather than a ceiling, and to resist pressure during implementation to narrow the Fund's mandate to the lowest-risk, most straightforward interventions.

Question 6: Do you agree with the proposed technology scope and are there any technologies missing?

Cleantech for UK broadly agrees with the proposed technology scope, which covers the core domestic decarbonisation stack. We offer three observations.

The inclusion of heat batteries alongside heat pumps is welcome and important. Heat batteries, thermal storage devices that charge using off-peak or surplus renewable electricity, address one of the principal barriers to heat pump adoption by decoupling generation from demand and reducing grid stress. Several UK companies are commercialising heat battery technology and the Fund's equity instruments are well-suited to supporting their scale-up. We would encourage DESNZ to treat heat batteries as a first-class technology within the scope, rather than a subcategory of heat pumps.

On demand-side flexibility, the current scope references smart meters and V2G chargers but does not explicitly capture the software and aggregation layer that makes flexibility valuable. Demand flexibility platforms, home energy management systems and virtual power plant operators are the connective tissue between individual assets and the grid. Without investment in this layer, the hardware investments the Fund supports will not reach their full potential. We recommend that software-enabled flexibility platforms be explicitly included within scope. This is also where the UK has a genuine competitive advantage to protect and a real risk of repeating past mistakes. Several coalition members are developing world-leading capability in grid flexibility, smart thermal storage and consumer energy management. If the Fund does not back these innovations domestically, the IP and manufacturing will be commercialised elsewhere. Clean Power 2030 requires a grid and a consumer appliance base that can flex and respond at scale; the Fund should treat UK-owned innovation in this space as a strategic priority, not an afterthought.

The scope does not reference fabric measures as a primary technology category. While energy efficiency and adaptation measures are included, there is a risk that insulation and fabric retrofit is treated as a secondary or enabling measure rather than a core investment priority. The Energy Efficiency Infrastructure Group (2024) estimates that fabric-first retrofit reduces the running costs of a heat pump by up to 40% compared with installation in an uninsulated property. The scope should give fabric measures equivalent standing to heat and power technologies.

The technology scope should also explicitly recognise digital infrastructure that enables verification, reporting and financial interoperability across retrofit programmes.

As retrofit markets mature, real-time operational data, automated emissions accounting and standardised verification systems will become increasingly important to attracting institutional capital and demonstrating value-for-money at programme scale. These are not substitutes for physical retrofit, but they are necessary for proving performance, allocating capital efficiently, supporting consumer trust and potentially unlocking additional revenue streams from verified emissions reductions.

Section 2A: Owner-Occupiers

Question 15: How could the loans scheme be designed to encourage new products or entrants into the market?

The loans scheme will only generate meaningful market development if its design actively creates space for new entrants rather than defaulting to established lenders and conventional products. We offer three design principles.

First, the scheme should establish an open access framework for accredited lenders rather than a small panel of preferred partners. Several of our members are developing or partnering with fintech and specialist green lenders who have more flexible credit models and better customer journeys than high street banks. Restricting the scheme to a small number of established lenders will reproduce the risk aversion and product conservatism that currently characterises the green finance market, as documented in the Green Home Finance state of the market review (2024).

Second, product innovation should be incentivised through the scheme's terms. Lenders offering genuinely novel finance structures, including income-linked repayments, bill-savings-secured products or integrated EaaS financing, should receive more favourable access to the scheme's wholesale capital than those offering standard personal loans with a green label. The Green Home Finance Strategic Partnership is well placed to operationalise this distinction, but it needs an explicit mandate to do so.

Third, the scheme should include a dedicated facility for smaller, specialist lenders who lack the balance sheet to participate at scale but serve communities and customer segments that mainstream lenders do not reach well. A ring-fenced allocation within the £1.7 billion consumer loans tranche, administered through the British Business Bank or a similar intermediary, would enable credit unions, community development finance institutions and specialist green lenders to participate on terms commensurate with their size.

Question 16: What loan attributes would be most valuable to expand in the market?

Based on structured engagement with coalition members active in consumer-facing retrofit and clean energy deployment, we identify the following loan attributes as most valuable, in approximate order of priority.

Longer tenors are the single most impactful attribute. The current consumer finance market offers personal loans of up to five to seven years for home improvement, producing monthly repayments that are too high relative to bill savings for many households. Tenors of ten to twenty years, secured against the property or linked to the energy performance improvement, would bring monthly costs in line with bill savings and make the proposition viable for a much wider population. This is the model used by KfW in Germany, and it is the primary reason German green lending volumes are an order of magnitude larger than those in the UK. Resolution Foundation analysis (2023) confirms that repayment period is the single variable most correlated with stated willingness to take a green loan among median-income households.

Below-market interest rates are important but secondary to tenor. A 0% loan over five years is less accessible than a 3% loan over fifteen years for a household managing on a median income. Government's cost of borrowing means it can offer rates that the private market cannot, and this advantage should be deployed to extend tenor first and reduce rate second.

Integration with installation is the attribute most consistently cited by our members as the difference between a product that converts and one that does not. Loans arranged at the point of installation, with the installer or EaaS provider embedded in the customer journey, have

significantly higher take-up than those requiring a separate financial institution application. The scheme should mandate or incentivise installer-integrated distribution models.

Stronger consumer protection and clear redress mechanisms are prerequisites for trust in any novel finance product. The experience of rent-a-roof solar schemes in the 2010s, where consumers were locked into disadvantageous long-term contracts, has had a lasting negative effect on consumer confidence in green finance. Any new products entering the market through this scheme should meet a clear minimum standard on portability, early repayment and exit rights, with the scheme operator responsible for enforcement.

Finally, reduced VAT on early-stage cleantech products supported by the Fund would directly lower the consumer cost barrier without requiring grant subsidy. VAT is currently 0% on a defined list of energy-saving materials under HMRC schedules, including insulation, solar panels and heat pumps. Extending this treatment to heat batteries, demand flexibility hardware (including non-installed, plug-and-play energy products) and other Fund-eligible technologies would immediately improve the loan-to-cost ratio for consumers and reduce the size of loan required to achieve an affordable monthly payment.

For performance-linked loans, the most valuable additional attribute would be a trusted verification mechanism. If actual bill or carbon savings can be measured and audited at portfolio level, lenders could offer rate reductions, longer tenors or contingent repayment structures linked to achieved outcomes. This would reduce greenwashing risk and help households trust that the finance product is tied to real performance rather than a generic home-improvement loan.

Section 2D: Energy as a Service

Questions 40 to 42: Would energy as a service models support the draft Warm Homes Fund aims? Is there a need for finance, and how could government address this gap?

A number of Cleantech for UK coalition members operate or are developing energy-as-a-service and solar subscription models. Their collective experience points to three issues for the Warm Homes Fund to address.

Working capital constraint: EaaS models require the provider to finance upfront hardware installation and recover costs over a ten to twenty year subscription period. Commercial lenders will not provide working capital at the scale and tenor required without government risk-sharing. A Warm Homes Fund facility offering longer-tenor lending at near-gilt rates would directly enable these models to scale.

Consumer switching risk: the CfE correctly identifies the risk of consumers being locked into a single supplier. Our members support a regulatory requirement for portability of EaaS contracts on property sale or supplier switch, as a condition of Warm Homes Fund support for these models.

Regulatory uncertainty: investors cannot model the risk profile of EaaS businesses in a market where consumer protection frameworks, switching rights and supplier obligations remain undefined. DESNZ and Ofgem should prioritise a clear regulatory framework for EaaS as a precondition of Fund equity investment in this cohort. The absence of this framework is itself a barrier to private capital that government can directly address.

EaaS models would also benefit from a standardised approach to outcome reporting. Government-backed finance should require providers to publish comparable data on customer

bills, comfort, system availability and emissions reductions, with appropriate privacy safeguards. This would protect consumers, help DESNZ identify underperforming models early and give private investors the verified operating data they need to finance larger portfolios.

Section 2E: Manufacturing and Supply Chain

Question 53: How could equity investment support the draft Warm Homes Fund aims, when could benefits be realised, and what risks need to be considered?

Cleantech for UK strongly supports the inclusion of equity investment as a core instrument of the Warm Homes Fund. Equity is not a peripheral or exotic addition to the Fund's toolkit: it is the mechanism best suited to the structural challenge the Fund is trying to solve. The UK has a well-developed cleantech innovation base but a persistent and well-documented failure to convert that innovation into scaled, commercially viable businesses. Early-stage innovators are too risky for institutional investors and too capital-intensive for angel or VC finance alone. Grant funding is available but typically fragmented, time-limited and not designed to sustain companies through the critical scale-up phase. Equity from the Warm Homes Fund can fill this gap and in doing so catalyse a much larger volume of private capital.

Bringing down costs through manufacturing scale

The Fund's stated aim is to bring down costs and scale up deployment of low carbon technologies. Equity investment in domestic manufacturers is one of the most direct routes to achieving this. The government has set an ambition for at least 70% of the heat pumps installed in the UK to be made domestically. Reaching that target requires a step change in manufacturing capacity that cannot be delivered through grant funding alone. Equity from the Warm Homes Fund, patient and longer-horizon capital that a private investor cannot justify at current market scale, would provide exactly the kind of support that unlocks private co-investment and de-risks factory expansion decisions. In offshore wind, targeted public equity and co-investment in supply chain businesses helped drive down the cost of generation from over £150/MWh a decade ago to below £50/MWh today. The same logic applies in heat: investing in manufacturing capacity creates the learning-by-doing and economies of scale that reduce unit costs over time.

The grant targeting problem and the case for a broader cleantech basket

The current grant landscape concentrates demand-side support heavily on heat pumps through the Boiler Upgrade Scheme. While the BUS provides £7,500 per installation, heat pumps remain beyond the financial reach of the majority of UK households, particularly those in the non-able-to-pay market. ECIU analysis (2024) found that even with the BUS grant, the all-in cost of heat pump installation and associated works averages £10,000 to £15,000 for a typical semi-detached home, compared to £2,000 to £4,000 for a gas boiler replacement. The NAO's 2024 report on low-carbon heating found that BUS take-up has been heavily skewed toward higher-income households in detached properties, with minimal penetration in flats, terraced housing or households with incomes below £40,000.

This concentration creates both an equity problem and an efficiency problem. The equity problem is that the households most exposed to fuel poverty are least likely to access the primary grant instrument. The efficiency problem is that government is subsidising a technology that remains politically difficult to mandate at scale, while a number of lower-cost, more accessible cleantech innovations remain without meaningful demand-side support.

Cleantech for UK urges government to rebalance grant support across three to four accessible innovations alongside heat pumps: heat batteries, solar-plus-storage systems, stand-alone

batteries, demand flexibility services and advanced fabric measures. Each of these offers a lower upfront cost, is accessible to a wider range of property types and tenure arrangements, and can deliver meaningful bill savings without requiring the household upgrades that heat pump installation often demands. The Warm Homes Fund's investment criteria should reflect this rebalancing explicitly.

Supporting innovative delivery models

Beyond manufacturing, equity investment is the right instrument for the cohort of companies developing innovative delivery and financing models, including energy-as-a-service providers, demand flexibility aggregators, software platforms for home energy management and retrofit finance vehicles. These companies are typically past proof-of-concept but cannot access conventional debt finance because their revenue streams are long-dated, asset-light or dependent on regulatory conditions that are still evolving. Total equity investment in UK cleantech rose by 58% year-on-year to £3.9 billion in 2025, though the bulk of that capital flowed to software businesses and proven, late-stage operators. The companies most relevant to the Fund's objectives, those at growth stage building physical assets and workforce, are precisely those that the private market is currently underserving.

Crowding in private capital

A well-designed government equity instrument has a multiplier effect. By taking a minority stake alongside private co-investors, or by making a first investment that establishes a valuation and de-risks the proposition, the Fund can mobilise private capital that would not otherwise be deployed. The government's expanded Heat Pump Investment Accelerator was designed to crowd in up to £130 million of additional industry investment from £30 million of public capital. The Warm Homes Fund's equity envelope, if deployed strategically, should be held to at least this standard of leverage, and the Fund should publish its crowding-in ratio as an annual performance metric.

Creating investable verified outcome portfolios

Equity investment should also support companies that make retrofit outcomes measurable, financeable and tradable. This includes businesses that provide independent measurement and verification, carbon accounting, portfolio management, data infrastructure and market access for verified emissions reductions. These capabilities can help the Fund move beyond counting installations to proving delivered outcomes. Where robust additionality criteria are met, verified emissions reductions could create supplementary revenue that is recycled into further retrofits, lowers the net cost to households, or improves the Fund's overall return.

This should be designed carefully. Any outcome monetisation should be additional to statutory obligations, avoid double counting against public carbon budgets, protect consumer benefit-sharing, and use transparent methodologies that can be audited by government and market participants. The principle is not to commoditise public subsidy, but to ensure that genuine additional carbon and energy benefits are captured rather than left unvalued.

When benefits could be realised

In the near term (one to three years), equity investments in scaling businesses will begin to show up as increased domestic production capacity, more installer capacity in the market and the first commercial deployments of innovative delivery models. In the medium term (three to seven years), cost curves should begin to fall as domestic manufacturing reaches scale. In the longer term (seven years plus), successful equity investments should generate financial returns to the taxpayer as the businesses backed by the Fund grow and government stakes appreciate or are recycled into further investment.

Risks to consider

Risk of commercial displacement: government equity should not crowd out private capital that would otherwise flow into the sector. The Fund should apply an additionality test to all equity investments, demonstrating that the investment addresses a genuine market failure rather than substituting for private finance that is available.

Policy dependency risk: many of the businesses the Fund might back are dependent on continued policy support for their revenue projections to be viable. The Fund should conduct scenario analysis on each investment's resilience to policy change and prefer businesses with diversified revenue streams where possible.

Governance and conflict of interest risk: government as equity investor creates governance challenges distinct from government as grant-maker or lender. The Fund will need clear governance protocols and should draw on the experience of the British Business Bank and the National Wealth Fund in managing these tensions.

Concentration and timing risk: early-stage funding for UK cleantech startups fell sharply in 2025, with transaction volumes roughly halving year-on-year. This suggests the pipeline of investment-ready businesses at the growth stage may be thinner than headline investment figures imply. The Fund should invest in developing the pipeline, not just deploying capital into whatever is available at launch.

In summary, equity investment is one of the Warm Homes Fund's most powerful instruments. Used well, it can achieve things that loans and grants cannot: building domestic industrial capacity, commercialising innovative delivery models and mobilising private capital at scale. The risks are real but manageable with appropriate governance and additionality discipline. We urge government to treat equity as a core and deliberate part of its investment strategy from the outset, not as a residual or experimental allocation.

Question 54: Is there a need for finance here, and what are the barriers that prevent the private sector from filling it?

Yes. The need for equity finance in the warm homes supply chain is substantial and well-evidenced. Private markets are not filling this gap, and the structural reasons for that failure are unlikely to resolve themselves without public intervention.

The core problem is a mismatch between the investment characteristics of scaling cleantech manufacturers and the requirements of private capital. Venture capital funds typically seek to exit at Series B or C, before companies have reached the manufacturing volumes needed to attract infrastructure or growth equity. At that point, institutional investors require bankable revenue streams, contracted cashflows and de-risked technology. Growth-stage cleantech manufacturers, particularly those producing physical hardware such as heat pumps, heat batteries and insulation systems, sit between these two categories: too capital-intensive and slow-revenue for venture, too unproven and early-stage for infrastructure. This is the valley of death, and it is structural, not cyclical. The British Business Bank's UK Venture Capital and Growth Equity Monitor (2024) documents this financing gap explicitly for hardware-intensive sectors.

Several specific barriers compound the problem. First, the absence of long-term demand signals: private investors price policy uncertainty directly into their required returns. Without a durable, legislated trajectory for standards and deployment targets, the revenue projections of supply chain businesses look contingent and fragile. Second, the concentration of private cleantech capital in software and late-stage businesses: total equity investment in UK

cleantech reached £3.9 billion in 2025, but the distribution is heavily skewed toward asset-light businesses and proven operators. Hardware manufacturers and first-of-a-kind installers attract a fraction of this. Third, the absence of domestic patient capital at the scale required: the British Business Bank and Innovate UK provide some early-stage support, but there is no dedicated vehicle positioned to take minority equity stakes in growth-stage cleantech manufacturers at the scale the Fund's ambitions require.

A further barrier is the absence of trusted performance data. Private capital is more willing to finance solar or wind portfolios because production data, maintenance risk and revenue streams are well understood. Retrofit portfolios are harder to underwrite because savings depend on property condition, occupant behaviour, installation quality and changing energy prices.

Businesses capable of standardising baselines, verifying delivered energy reductions and managing portfolio-level performance therefore address a financing barrier in their own right. Over time, this kind of infrastructure could materially improve the ability of institutional investors to assess, and finance retrofit at scale.

The consequence is that UK cleantech companies either raise from overseas investors, with the associated risks of offshoring intellectual property and manufacturing, or stall at the scale-up phase. The Warm Homes Fund's equity envelope is therefore not just desirable but necessary.

Question 55: How could government finance address this gap with equity where government earns a return?

Government equity can bridge the gap identified in Q54 through a structured co-investment model with clear additionality requirements and a defined return pathway. We propose the following design principles.

The Fund should operate as a minority co-investor alongside private lead investors, rather than as a primary or sole equity provider. This preserves market discipline: private investors set the valuation and lead the diligence, while government capital fills the gap left by private risk aversion. A typical structure might involve the Fund taking a 20 to 30% stake alongside a private investor syndicate, with standard shareholder rights, board information access and a pro-rata follow-on option. This is consistent with how the British Business Bank's managed funds operate and avoids the governance risks associated with government as controlling shareholder.

Staged investment reduces fiscal risk while keeping early-stage companies in scope. An initial tranche at technology readiness level 7 to 8 (pilot to demonstration scale), with contractual options to follow on at commercial scale subject to milestone achievement, allows the Fund to build conviction before committing larger tranches. It also creates the right incentive structure for investee companies.

The Fund should be able to invest not only in manufacturers, but also in enabling infrastructure that improves the economics and investability of retrofit at portfolio scale. This could include verified-outcome registries, retrofit data infrastructure, carbon accounting systems, finance and aggregation platforms, and operational performance verification services.

These businesses can generate commercial returns through platform fees, verification services, portfolio management income and participation in verified outcome revenues, while improving transparency, auditability and investor confidence across the wider retrofit market. In doing so, they increase the investability of the physical retrofit companies and projects that the Fund supports.

For the Financial Transactions Control Framework to accommodate pre-revenue companies, a bespoke valuation approach is needed. IP value, patents and strategic sovereign asset value are credible and defensible bases for initial valuation. Independent technical assessment by bodies such as Innovate UK or the Faraday Institution can underpin these valuations without requiring revenue multiples that early-stage companies cannot yet produce.

Returns to government will be realised through trade sale of the equity stake as the company reaches maturity, secondary sale to institutional investors once revenue is established, or IPO proceeds for the most successful investments. The offshore wind analogy is instructive: early public equity in supply chain businesses generated substantial returns once the sector reached scale. The Fund should publish a target portfolio-level return, net of losses on unsuccessful investments, and report against it annually.

Where verified emissions reductions produce revenue, government should set clear rules for how proceeds are shared. A default hierarchy could require proceeds first to reduce household cost or improve consumer outcomes, second to recycle into additional retrofits in the same or comparable communities, and only then to contribute to investor or Fund-level returns. This would preserve public value and reduce the risk that carbon revenues are perceived as private extraction from publicly supported households.

Speed of deployment is a critical enabler. Cleantech companies at the growth stage need capital on a six to nine month fundraising timeline. Government equity processes that take eighteen months or more will miss the window. The Fund should establish a fast-track approval pathway for equity investments below a defined threshold, with delegated authority to an investment committee rather than full ministerial sign-off for each transaction.

Question 56: What are the wider policy barriers that may need to be overcome to realise the benefits of equity investment?

Equity investment alone will not unlock the full potential of the warm homes supply chain. Several policy barriers compound the finance gap and need to be addressed in parallel.

The most significant is the absence of durable demand signals. Manufacturers making factory investment decisions on the basis of current policy will face a viable business case today but an uncertain one in three years if standards are weakened, grant levels cut, or deployment targets revised. The Clean Heat Market Mechanism, the Future Homes Standard and the Boiler Upgrade Scheme all need to be placed on a long-term, legislatively backed footing if equity investors, public or private, are to treat revenue projections as credible.

Grid connection timelines represent a material barrier for manufacturers looking to expand or establish UK facilities. Several of our members report connection wait times of three to five years for sites requiring significant grid capacity. This is a direct constraint on the pace at which domestic manufacturing can scale regardless of the availability of equity capital. Ofgem and the network operators need to develop an accelerated connection pathway for strategically important manufacturing sites. More broadly, network innovation has not kept pace with the Clean Power 2030 ambition. The regulatory framework governing distribution networks, including the RIIO-ED2 price control and Ofgem's innovation funding landscape, needs to move faster to accommodate the volume of consumer-sited generation and flexible demand that the Warm Homes Plan envisages. The Fund's investments in smart appliances, heat batteries and vehicle-to-grid systems will only generate returns if the network infrastructure and regulatory conditions exist to support them at scale.

Planning and permitted development constraints slow the deployment that creates the demand pull for supply chain investment. Equity investment in manufacturers will only generate returns

if installation volumes grow at the pace the Warm Homes Plan envisages. Extending permitted development rights for heat pumps, as the CfE indicates is under consideration, is a necessary step. A streamlined planning process for commercial-scale installations in social housing would also materially improve deployment economics.

There is a skills and workforce gap that equity investment in manufacturers cannot on its own resolve. Even a well-capitalised heat pump or heat battery manufacturer cannot grow faster than the installer base that fits its products. The Fund's equity investments should be designed as part of a joined-up package that includes the skills loans and training finance addressed in Section 2E, with installer capacity building treated as a co-condition of supply chain equity investment where relevant.

Finally, the absence of a fit-for-purpose regulatory framework for energy-as-a-service and subscription models creates uncertainty that depresses equity valuations for this cohort of companies. Investors cannot model the regulatory risk in a market where the consumer protection framework, switching rights and supplier obligations for EaaS providers remain undefined. DESNZ and Ofgem should prioritise the development of a clear regulatory framework for these models as a condition of the Fund taking equity stakes in EaaS businesses.

Measurement, reporting and verification policy is also a barrier. The UK lacks a consistent framework for recognising verified retrofit outcomes across grants, loans, equity investments and voluntary carbon markets. DESNZ should set minimum requirements for baselines, metering, data access, privacy, additionality, benefit-sharing and double-counting safeguards. Without this, promising climate-finance and verification businesses will face uncertainty over whether their outputs are recognised by government, investors or buyers of verified outcomes.

Over time, robust verification and reporting infrastructure could play an important role in transforming retrofit from a grant-dependent activity into a more investable and measurable form of climate infrastructure capable of attracting larger pools of institutional capital.