Peterborough Accelerated Net Zero

Business models and complementary funding mechanisms to support heat pump deployment

October 2025

Acronyms and abbreviations

BUS	Boiler Upgrade Scheme
CaaS	Comfort-as-a-Service
CAPEX	Capital Expenditure
COP	Coefficient of Performance
EaaS	Energy-as-a-Service
ECO	Energy Company Obligation
ESO	Electricity System Operator
GLA	Greater London Authority
HPaaS	Heat Pump-as-a-Service
HUG	Home Upgrade Grant
LAD	Local Authority Delivery
OSS	One-Stop Shop
PANZ	Peterborough Accelerated Net Zero
PaYS	Pay-as-You-Save
PLF	Property Linked Finance
PPA	Power Purchase Agreement
RE	Renewable Energy
RHI	Renewable Heat Incentive
SHDF	Social Housing Decarbonisation Fund

Contents

Introduction

Context and overview

The Peterborough Accelerated Net Zero (PANZ) project is developing a comprehensive platform that integrates technical, social, demographic, and economic data to develop effective Net Zero plans.

To support this initiative, Energy Systems Catapult has designed a Go-to-Market report that sets out a strategic pathway to accelerate rural heat pump deployment. Central to this strategy is the establishment of a Retrofit one-stop shop (OSS) in Peterborough.

An important part of our research, that informed our decision to prioritise the retrofit OSS model, was an initial assessment of business models and complementary funding mechanisms that could encourage rural heat pump adoption. This report outlines the longlist of options considered during that initial research phase.

Designed as a practical resource for other local authorities, this report aims to serve as a knowledge bank that accelerates learning, minimises duplication of research effort, and provides a strong foundation for further, context-specific exploration.

Business models to support heat pump deployment

Business model overview

The table below gives an overview of business model options that could support heat pump deployment, which are explored in greater detail throughout this section*. These models support adoption in different ways — either by enabling the purchase and installation of heat pumps or by maximising their value (post installation) through energy cost savings. Where available, case studies illustrating real-world applications of these models are included.

Business model	Description
Heat Pump Finance (with Optional Maintenance)	Heat pump owners pay little to no upfront cost for the installation of heat pumps. The capital cost of the installation worksare recovered through monthly payments. Maintenance plans can be purchased separately.
Heat Pump-as-a-Service (HPaaS)	Heat pump owners pay a subscription for the full design, installation and maintenance of a heat pump over a contractual period. The subscription may include a fixed price per unit of energy consumed or per unit of heat delivered.
Comfort-as-a-Service (CaaS)	Heat pump owners pay a subscription for the full design, installation and maintenance of a heat pump over a contractual period. The price paid is based on an agreed level of heat or comfort as opposed to units of electricity (kWh).
Retrofit one-stop shop	A platform aimed at leading consumers through the entire retrofit journey, which will typically provide advice on measures, retrofit assessments, introductions to local installers and retrofit coordinators, and signposting to available funding and finance.
Pay-as-you-Save (PaYS) / Energy-as-a-Service (EaaS)	Homeowners or tenants pay little to no upfront cost for installation of whole house retrofit measures. The capital cost is recovered through energy bill savings.
Heat Pump Flexibility	Heat pump owners are incentivised for shifting their electricity use during certain periods (flexibility events).
Smart Electricity Tariffs	Heat pump owners are incentivised to use 'cheap' electricity to warm the home during non-peak hours.
Clean Heat Discount	Heat pump owners receive a clean heat discount on energy for using electric heating — enabled by removing levies from a proportion of the household's energy bill.
Maximising Self Consumption	The integration and optimisation of solar panels and heat pump assets to maximise the consumption of renewable energy and reduce energy costs for homeowners or tenants.
Community Owned Renewable Enabled Heat	Community members invest in and own shares in a renewable generation asset. Renewable energy is sold to heat pump owner's households at a reduced rate, resulting in energy bill savings.

**Please note that this section reflects data and insights available at the time of writing (December 2024). No subsequent updates have been made.*

Heat pump finance

This model enables rural households to benefit from the installation of a heat pump without paying upfront costs. Instead, households pay monthly instalments to recover the initial investment.

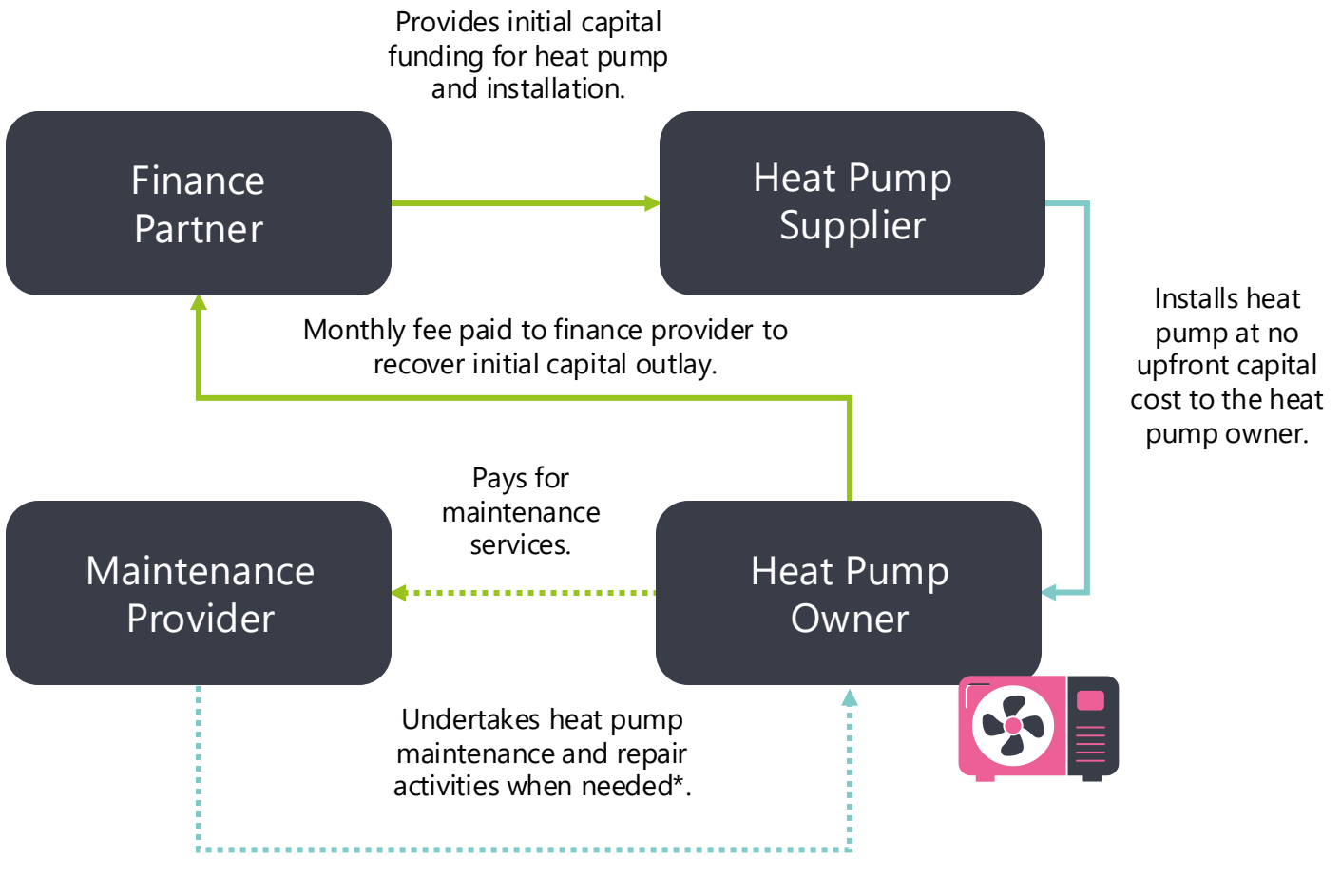
First, the heat pump supplier undertakes a home energy assessment to provide an installation quote.

The finance partner and household applicant then enter into a finance agreement which details the monthly payment amounts, duration of the agreement, and any applicable interest charges.

The heat pump supplier then arranges and carries out the installation.

The household applicant may also enter into a separate maintenance agreement which offers additional benefits beyond the standard warranty.

*Heat pump supplier and maintenance provider may be the same organisation.



Heat pump finance

Primary benefits

- Offers heat pump installation at zero upfront cost to customers unless provider requires an initial deposit.
- Some providers may offer flexible terms, allowing customers to tailor repayment plans to their needs.
- Can be used in combination with other models (e.g., heat pump flexibility and/or smart tariffs), maximising the value of installing a heat pump for customers.
- Subject to satisfying eligibility criteria, customers can benefit from the Boiler Upgrade Scheme (BUS) grant, which currently provides a £7,500 discount towards air source and ground source heat pumps[1]. The grant amount would be deducted from the total installation cost.

Key risks and considerations

- Unlikely to be accessible to customers with poor credit score as finance applications are subject to credit check.
- Customer will pay more overall for heat pump installation, compared to a direct purchase, due to interest rates.
- Requires commitment to multi-year contract (typically 5-15 years), though some providers may offer early payment options.
- Proposition likely to be most attractive to owner-occupied properties.
- Does not provide a full property retrofit solution to maximise heat pump performance unlike other models (e.g., EaaS).

Heat pump finance

Case study: Aira[2-3]

Overview

Aira and Stax have partnered to provide customers with flexible financing options for heat pump installations.

Customers first receive a free home energy assessment, undertaken by Aira, where they are provided with a fixed quote for the installation works. Stax then manage heat pump finance applications. Once a payment plan has been agreed between Stax and the customer, Aira reach out to customers to arrange the installation.

Financials

Monthly payment plans differ considerably depending on the total quoted installation cost, the term of the finance agreement, as well as the interest rate.

The length of finance agreements range between 5-15 years, with representative examples of finance payment plans outlined in the table to the right.

Scale of deployment

Accessible to all households though applicants are subject to receiving a credit check.

Finance components	Example 1	Example 2
Cash Price	£6,289	£9,261
% Deposit	0	0
60 Monthly Payments of	£130	£192
Interest Rate	8.9% per annum, fixed	8.9% per annum, fixed
Total Amount Payable	£7,815	£11,508

Representative examples of finance payment plans for Aira heat pumps[2].

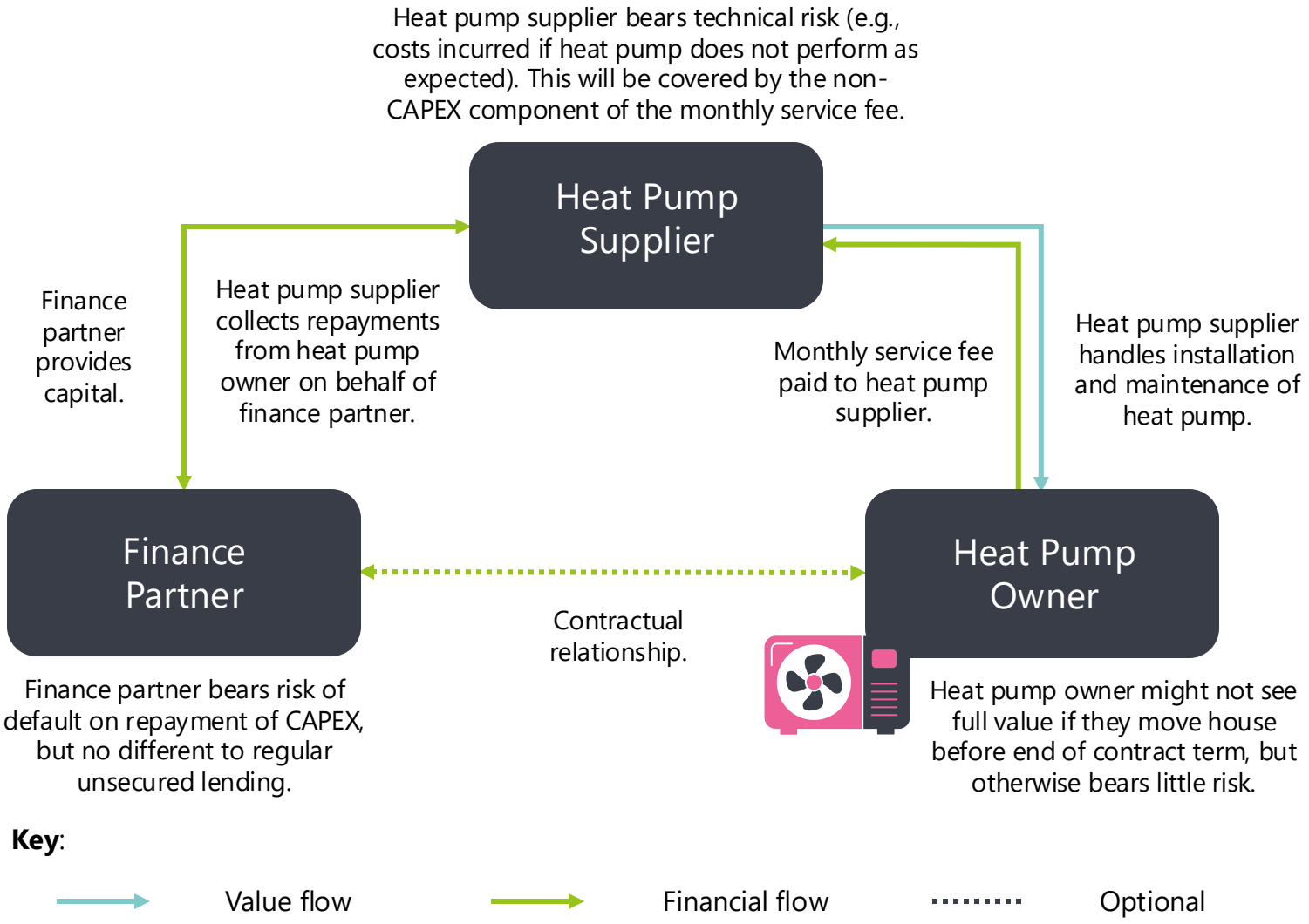
Heat Pump-as-a-Service

In this model, heat pump owners pay no upfront cost; they instead pay a monthly service fee.

Unlike simple equipment financing, which only covers the capital expenditure (CAPEX) cost, the monthly service fee for HPaaS also includes maintenance and repairs, and a performance guarantee (e.g., ensuring the heat pump delivers a specified temperature consistently).

The monthly fee may also include optimisation of the heat pump to reduce running costs.

This model requires the heat pump owner to sign a contract for a fixed term of typically 10-15 years. If the heat pump owner sells their property, they will still be responsible for monthly payments.



Heat Pump-as-a-Service

Primary benefits

- No upfront cost to consumer, reducing financial barriers to adoption.
- Performance guarantee, mitigating fears of not being warm enough.
- Risk is borne by finance and heat pump providers rather than the consumer.
- Business model already launched in UK.

Key risks and considerations

- Only suitable for owner occupiers.
- Consumer is tied into long-term contract.
- Consumer must pay off loan if they move house before contract end, but might recoup cost back from increased property value.
- Currently subsidised by BUS, but this may not be available in future.
- Could be combined with other business models (e.g., smart electricity tariffs and heat pump flexibility).

Heat Pump-as-a-Service

Case study: Aira[4-5]

Overview

Aira is making heat pump technology available through an "all-inclusive" monthly payment plan. This is a personal loan with the consumer meaning they are still responsible for making payments if they move home.

Customers face no upfront costs and are offered a 15-year 'Comfort Guarantee', which includes a performance guarantee and a product warranty. The performance guarantee ensures that the heat pump delivers a 'cosy' temperature between 18-22°C. The product and installation warranty covers all parts and labour.

At the end of the 15-year period, customers have the option to extend their comfort guarantee.

Financials

The heat pump could deliver up to 25% heating cost savings and 75% carbon emission savings (100% carbon savings if in combination with a green tariff)*.

The installation of a heat pump has the potential to increase property value by up to £8,000.

Scale of deployment

Aira has plans to invest £300m into the UK market over the next three-years to encourage domestic heat pump adoption.

*Value quoted is for reference purposes only. Actual heat cost savings will vary depending on the household.

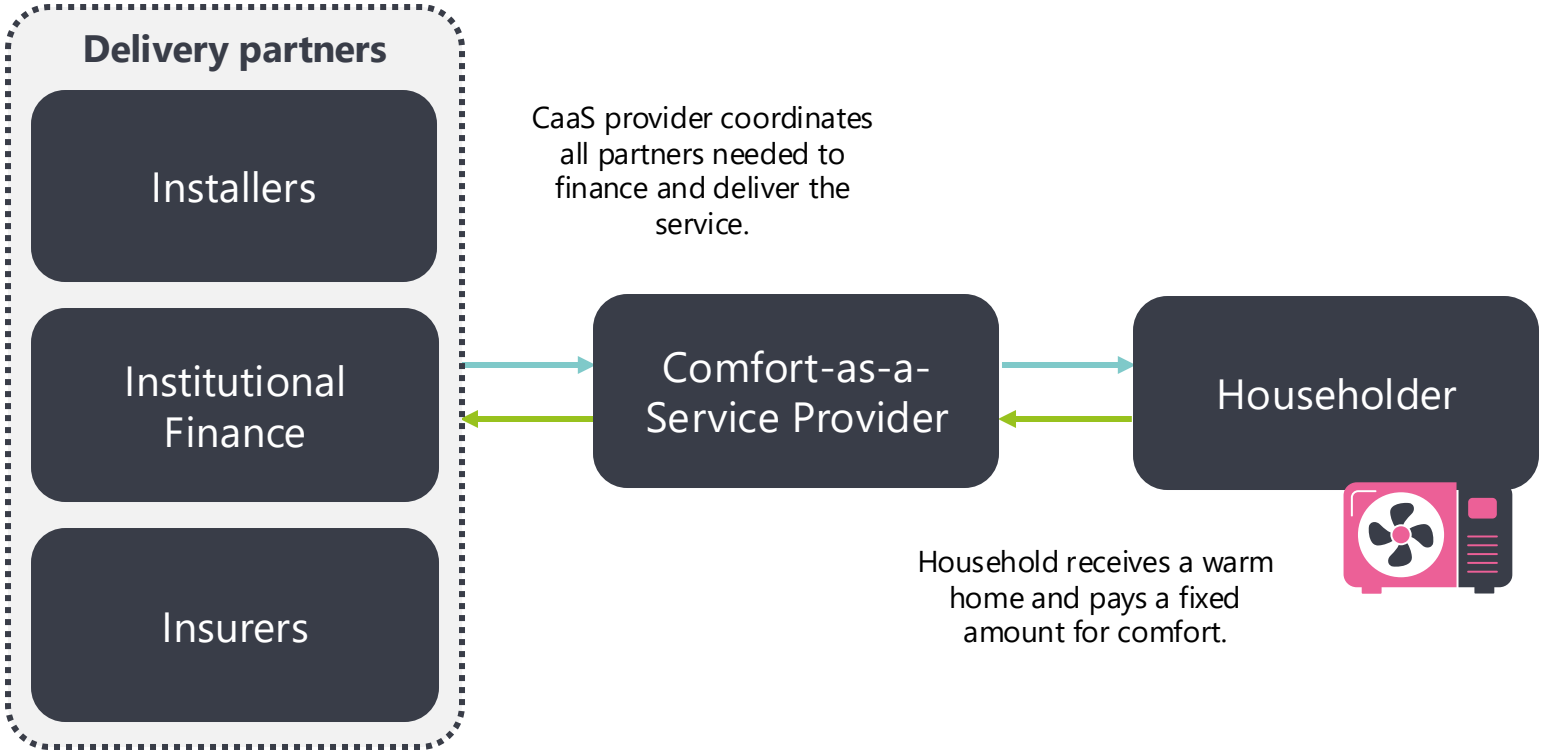
Comfort-as-a-Service

CaaS is an outcomes-based business model where customers pay for a guaranteed level of comfort rather than kilowatt-hours of energy.

The service provider is responsible for designing, installing and maintaining the best system to achieve the desired level of comfort at an affordable price.

This is likely to require upgrades to the fabric of the building as well as installation of a heat pump, to guarantee the necessary heating performance.

This business model is not currently a commercial proposition, as nobody has yet been able to determine a good way to quantify units of comfort and set a reasonable and viable price for them.



Key:

Value flow

Financial flow

Optional

Comfort-as-a-Service

Primary benefits

- Consumer-centric business model that is easy for households to understand.
- No upfront cost to consumer, reducing financial barrier to adoption.
- Comfort guarantee, mitigating fears of not being warm enough.
- Removes separate, variable energy bills for heating, increasing cost certainty for consumers.
- Risk is borne by finance and heat pump providers rather than the consumer.

Key risks and considerations

- Not currently a commercial proposition — nobody knows how to deliver it in practice.
- Innovation needed to overcome commercial risk.
- Regulatory barriers – Implications of algorithms working out how much people pay for energy.
- Might be a prospect for the future, but not a viable option right now.

Retrofit one-stop shop

Retrofit OSSs aim to provide householders with all the assistance they need to retrofit their homes, in one place.

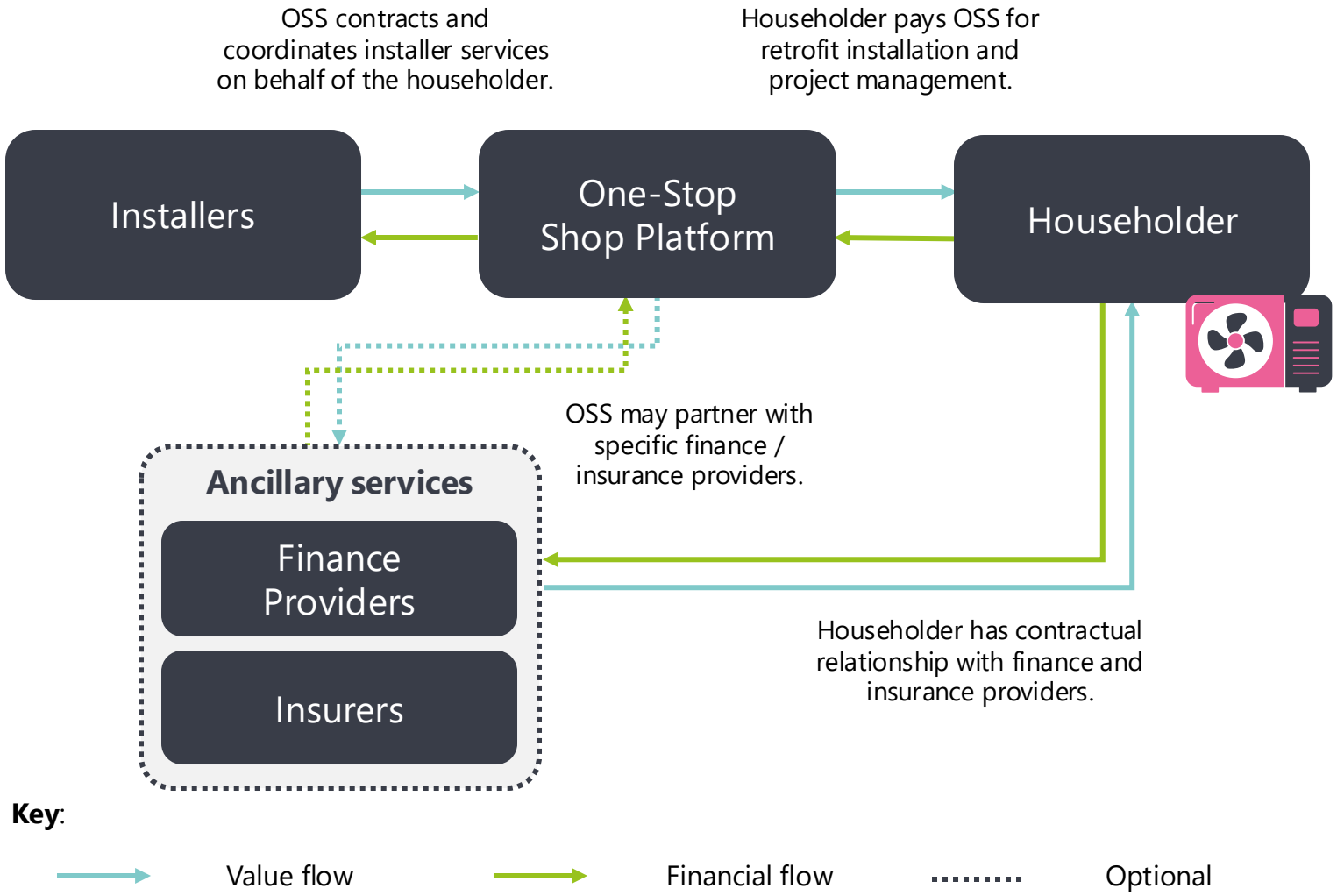
They generally comprise of an online platform/ website containing energy efficiency advice, signposting to installers, finance and grant funding, and home energy assessments.

OSSs may take different forms such as:

- Facilitation (advice only and signposting)
- Coordination (connecting householders with pre-vetted installers, finance providers, etc.)
- All-Inclusive (all of the above + managing retrofit delivery).

Each of these options carries different levels of liability and risk for the OSS provider. Some government/local authority-led OSSs may also offer specific financial incentives.

"All-Inclusive" model



Retrofit one-stop shop

Primary benefits

- Addresses non-financial barriers to heat pump adoption by giving households advice and connecting them with installers.
- Can provide a complete end-to-end retrofit journey for households.
- Can provide revenue streams for local authority partners (e.g., fees for surveys, commission from installers).
- Creates a pipeline for local supply chain and installer skills.

Key risks and considerations

- Mainly addresses able-to-pay market and homeowners, but can also serve landlords.
- Does not generally overcome financial barriers, as household still has to pay upfront cost of measures, but can provide access to finance.
- Can be operated by private entities, but often involves partnership between local authority and other relevant organisations.

Retrofit one-stop shop

Case study: Your home better (Greater Manchester)[6]

Overview

Your Home Better is an independent, not-for-profit service backed by the Greater Manchester Combined Authority, launched in 2022.

The offering for homeowners includes retrofit surveys, whole house plans and quotes for works, as well as coordination and installation through national retrofit experts Retrofitworks. The service also signposts households to relevant grant funding and offers an exclusive loan option in partnership with Manchester Credit Union.

Your Home Better engages with the community directly through a mobile hub and in partnership with local advocacy groups, such as Red Co-op. It also undertakes community-based projects, such as a battery aggregation project in partnership with Flexitricity, which will allow homeowners in Manchester to collaboratively manage their energy consumption.

Financials

Your Home Better has a transparent, fixed fee structure for home visits (£80), retrofit specifications (£25-50), surveys (£150) and whole house plans (£450). It also offers retrofit coordination services at a rate of 5% of the project cost.

Scale of deployment

Your Home Better is an area-based scheme targeted at residents of Greater Manchester. The service works with contractors and installers working in the North of England.

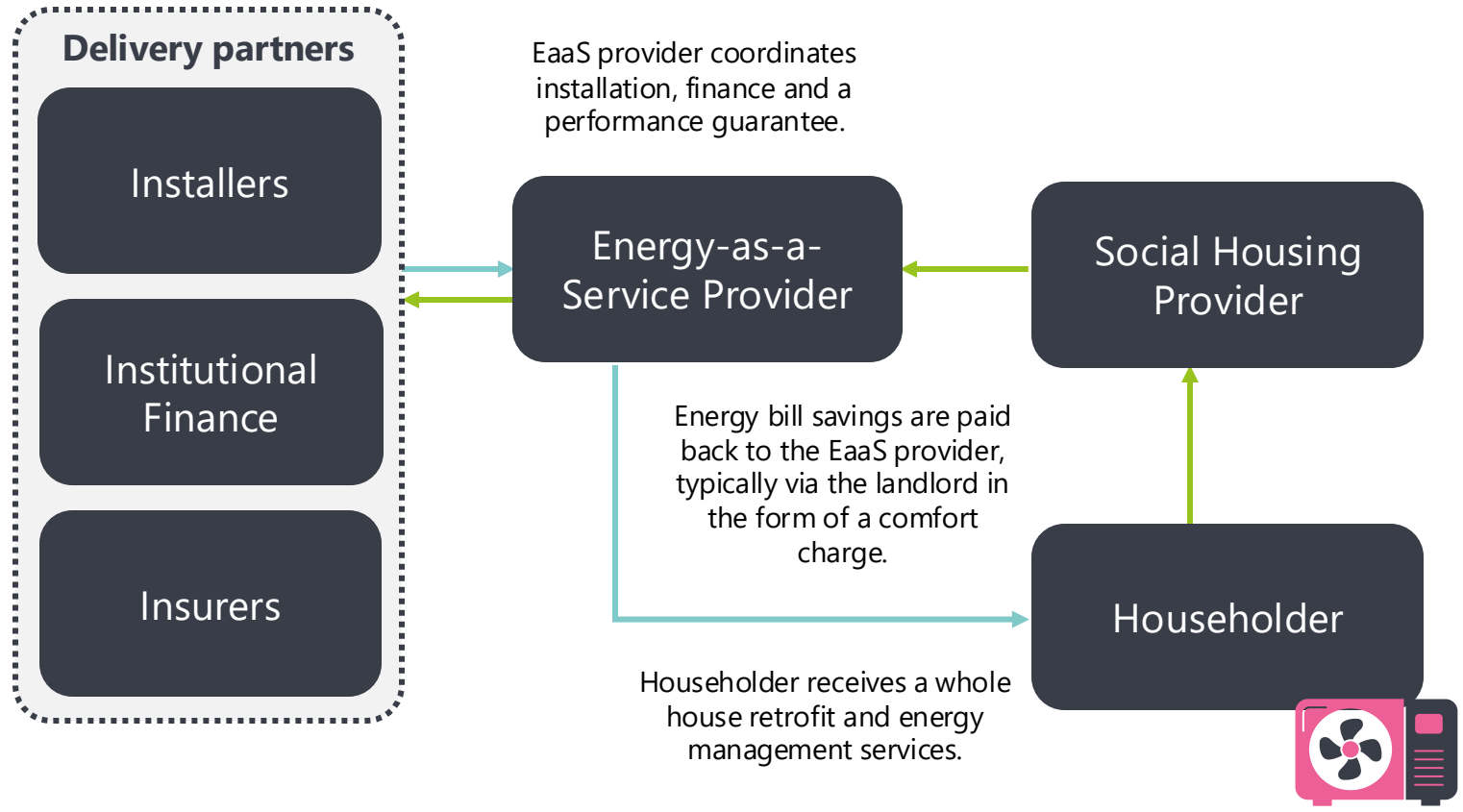
Pay-as-You-Save / Energy-as-a-Service

In PaYS business models, some or all of the energy bill savings achieved by retrofitting a home are used to pay back the capital cost of the measures.

This means the household does not have to pay the costs upfront or see an increase in their total monthly energy payments.

PaYS models may require an EaaS contract, in which the household's energy consumption is managed and optimised to guarantee predictable monthly payments.

These models are often used to finance whole house retrofit, where high capital costs are a significant barrier, and particularly in social housing, due to the long duration of the contracts.



Pay-as-You-Save / Energy-as-a-Service

Primary benefits

- End result is a Net Zero home.
- No upfront cost to households or landlords, reducing financial barriers to adoption.
- Guaranteed heating and hot water.
- Risk is borne by performance guarantee provider / insurer.
- Business model successfully piloted with social housing providers in the UK.

Key risks and considerations

- PayS models currently struggling to scale up in the UK.
- Access to long-term 'patient' capital and specialist guarantees is required, as retrofit projects require financing that can accommodate slow returns and manage delivery risk.
- Multiple types of skills and supply chain required (e.g., for insulation, heat pumps and renewables).
- More suitable for social housing rather than owner-occupiers due to 30-year length of contract.

Pay-as-You-Save / Energy-as-a-Service

Case study: Energiesprong[7]

Overview

The Energiesprong programme was launched in the Netherlands by the Dutch government in 2010, to decarbonise homes. It is an outcomes-based approach that aims to enable home retrofit at scale by allowing the capital cost to be repaid through energy bill savings.

The model requires extensive whole house retrofit to achieve net zero energy homes, and a long-term performance guarantee.

Energiesprong implements a package of retrofit and renewable energy measures, including heat pumps, that can be installed within a week. The whole house approach saves on additional costs and disruption that would be incurred by taking a more piecemeal approach.

Financials

The household may see a reduction in their total energy bill, or at least pays the same each month for a more comfortable home.

Payback times are typically 30 years.

Scale of deployment

The Energiesprong approach was pioneered in the UK with Nottingham City Homes, where 60 homes have been transformed to date.

Energiesprong has partnerships across Europe and more recently in the US, with over 5,000 home retrofits completed in the Netherlands, 11,000 total in Europe and almost 500 in the UK. A further 16,000 homes are currently in the pipeline, including 1,500 in the UK.

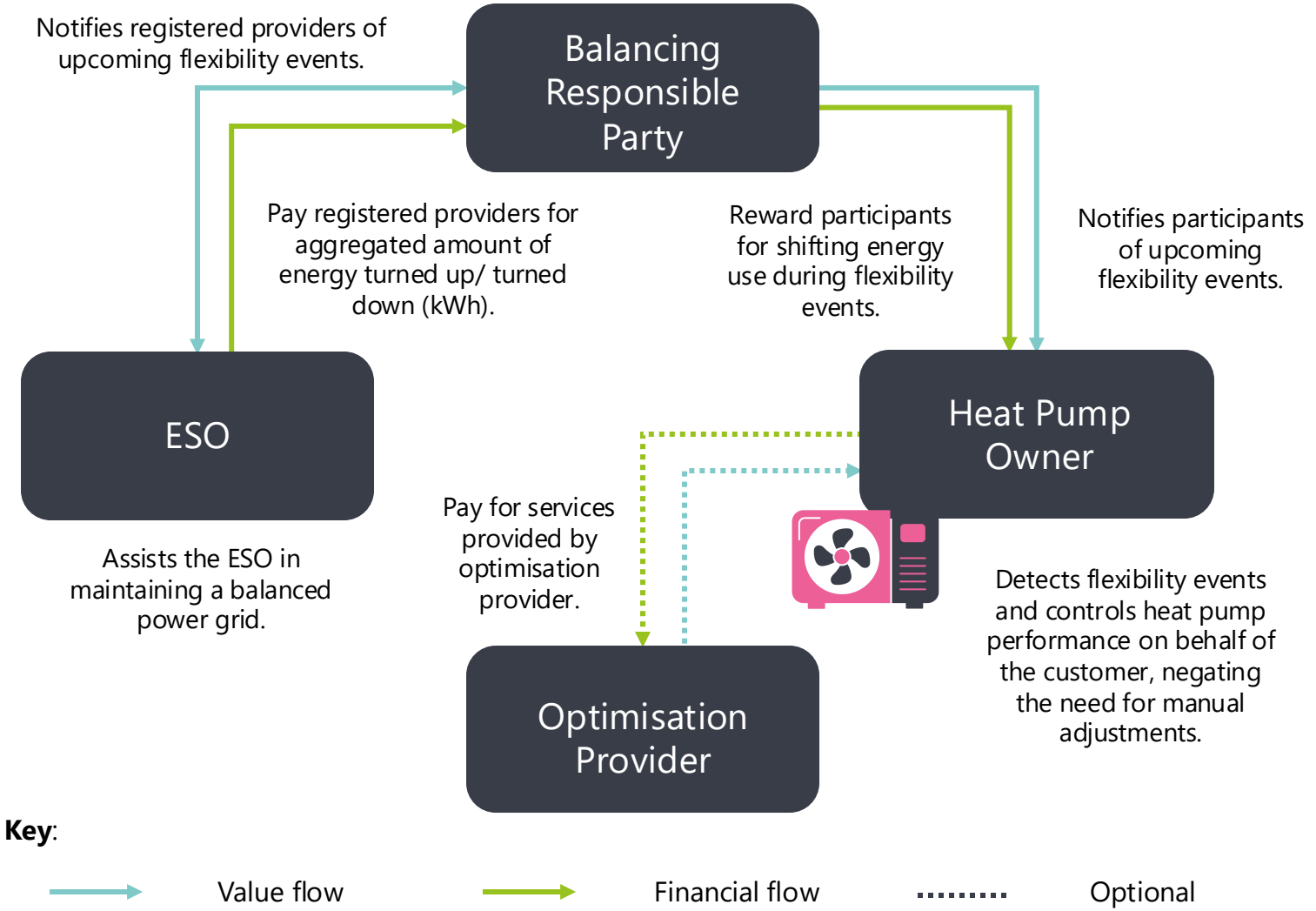
Heat pump flexibility

Under this model, heat pump owners are incentivised to shift their energy usage in line with flexibility events.

The Electricity System Operator (ESO) informs registered providers (e.g., energy suppliers) of upcoming flexibility events and pays them for the flexibility they provide to the power system.

Registered providers are responsible for informing participants (e.g., heat pump owners) of flexibility events and reward them if they shift their energy usage during these periods. Rewards may be money, points or prize-based.

Heat pump owners *may* use an optimisation provider to control heat pump performance during flexibility events on their behalf (at cost).



Heat pump flexibility

Primary benefits

- Consumers are incentivised for participating in flexibility events.
- Participation is voluntary, meaning households are not penalised if they do not participate in select events.
- Increases consumers' awareness of energy usage patterns and may encourage other energy efficiency improvements.
- Generates system wide benefits such as reduction in grid balancing costs and decrease in demand for fossil fuel-based electricity generation[8].
- If using the services of an optimisation provider, heat pump performance is optimised on behalf of consumers, reducing the need for manual control.

Key risks and considerations

- Domestic flexibility services are still being trialed, meaning the proposition is not yet commercially available.
- At the time of writing, trials have only run during winter months, meaning that customers can **currently** only benefit at certain time periods. However, the ESO is exploring the possibility of transforming domestic flexibility into a commercial service, available year-round[9].
- Proposition only available to households with smart meters.
- Unless using an optimisation provider, customers will have to manually control heat pump performance in line with flexibility events.
- Does not reduce capital cost of heat pump installation, meaning proposition is primarily targeted at able to pay market.
- Consumers may need to achieve high savings to perceive participation as being worthwhile.

Heat pump flexibility

Case study: Equinox flexibility trial[8,10]

Overview

The Equitable Novel Flexibility Exchange (EQUINOX) trial incentivises participants to turn down their heat pumps during peak times of energy demand (either through payments or energy bill reductions). The trial began in December 2022 and is planned to run until December 2025.

The first stage of the trial ran from December 2022 to April 2023, during which:

- 386 heat pump owners took part and provided a total turndown of 10.8MWh
- Heat pump owners turned off their heat pumps across 22x two-hour periods (from 5-7pm)
- The average participation rate across all EQUINOX events was 82%*.

The second stage of the trial ran from 30th October 2023 to April 2024, with the following changes:

- Double the number of participants
- Less regular timings of events — both in terms of intervals between events and timings of events (4-8pm)*
- Notices of future events were issued 'day ahead', 'morning of' and 'two-hours before'
- Higher payments issued to participants who turned down at shorter notice
- Payments based on each kWh of turndown (calculated using historical consumption data).

*Events refer to 'signals', which were sent to heat pump owners to turn down their heating.

Smart electricity tariffs

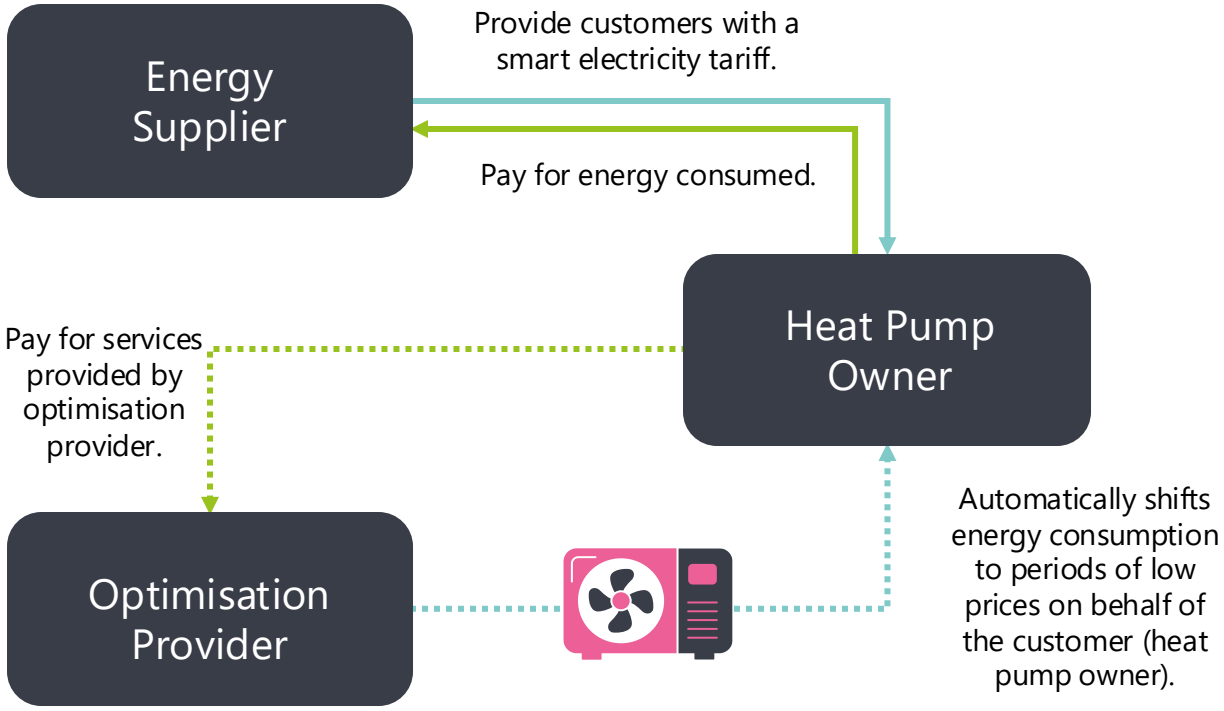
In this model, heat pump owners are incentivised to shift their energy usage in line with times that energy is cheaper.

Energy suppliers provide heat pump owners with a 'smart electricity tariff' which charges them different costs for energy (on a p/kWh basis) at different times of the day.

> Lower prices are *usually* observed in the early hours of the morning (4-6am) and the early hours of the afternoon (1-3pm).

The tariff prices are unlikely to be 'fixed' and will likely fluctuate in line with changes to the Energy Price Cap. However, the discount on energy may remain fixed (either as a percentage or a numerical value).

Heat pump owners *may* use an optimisation provider to control heat pump performance during different price periods on their behalf (at cost).



Key:

Value flow — Financial flow ····· Optional

Smart electricity tariffs

Primary benefits

- Customers should observe energy bill reductions if they shift their energy consumption to cheaper time periods*.
- There are several energy suppliers that currently offer smart electricity tariffs.
- Increases customers' awareness of energy usage patterns and may encourage energy efficiency improvements.
- Fixed energy discounts could enhance customers' understanding of the proposition.
- If using the services of an optimisation provider, heat pump performance is optimised on behalf of consumers, reducing the need for manual control.

Key risks and considerations

- Some suppliers charge a significant premium for energy consumed during peak periods, meaning that customers may not observe energy bill savings if they are unable to successfully change their energy consumption patterns.
- For variable energy supply contracts, tariff prices are subject to change in line with fluctuations in energy prices, which could lead to unpredictable costs for customers. However, this risk could be reduced by opting for a fixed contract.
- Proposition only available to households with smart meters.
- Unless using an optimisation provider, customers will have to manually control heat pump performance to benefit from periods of cheaper energy prices.
- Does not reduce capital cost of heat pump installation, meaning proposition is primarily targeted at able to pay market.

*Reductions observed compared to energy bills for heat pump households without a smart electricity tariff.

Smart electricity tariffs

Case study: EDF heat pump tariff[11]

Overview

EDF Energy are launching a trial tariff which *could* allow heat pump owners to save more than £164 on energy annually. The 'Heat Pump Tracker' tariff offers six hours of low-cost electricity daily (at 4-7am and 1-4pm).

Unlike other smart tariffs, the tracker tariff does not charge a premium price during peak periods. Instead, it consists of three daily rates: A day rate (set based on the local area), the heat pump tracker rate (a 10p discount off the standard tariff rate in the region) and a daily standing rate.

Financials

The tracker tariff follows a flexible pricing model that adjusts in line with the Price Cap set by Ofgem. Unit rates are reviewed every three months but the 10p discount remains constant.

The tariff has no exit or tie-in fees, leaving customers to switch at their discretion.

Scale of deployment

The trial is currently accessible for heat pump owners that have an existing variable tariff with EDF Energy and have a smart meter installed.

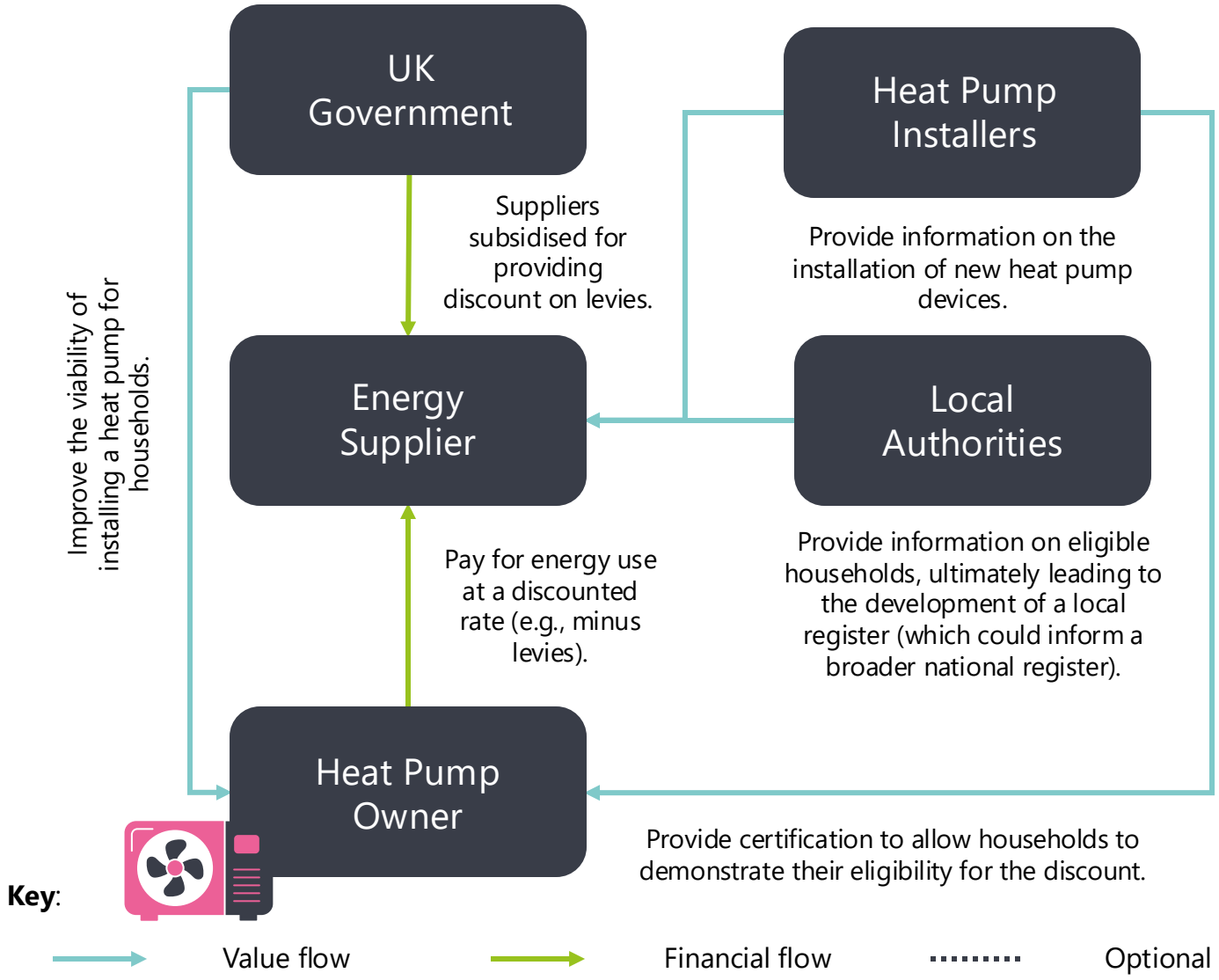
Clean heat discount

In the UK, electrically heated homes pay higher taxes than homes heated by gas boilers (per unit of energy consumed) because of greater levy costs[12].

This model could address this challenge by providing a 'Clean Heat Discount' to electrically heated households.

For a predefined amount of electricity, eligible households would receive a discount on energy bills equal to the amount they would usually pay in levies.

The cost of implementing the scheme could be covered using wider UK Government funding aimed at increasing energy efficiency and tackling fuel poverty.



Clean heat discount

Primary benefits

- Reduces the running costs of heat pumps so that heating costs are comparable to, if not cheaper than, using a gas boiler.
- Research suggests that an annual levy exemption on 3.5MWh* of electricity could save consumers on average £130 a year[13].
- Could be used in combination with other propositions (e.g., heat pump flexibility and/or smart tariffs), potentially resulting in higher cost reductions than each proposition in isolation.
- Unlike other models, does not require manual control of heat pump performance on behalf of customers, though customers will still need to register for the subsidy and undergo eligibility testing.

Key risks and considerations

- The Clean Heat Discount is currently only a concept, and the UK Government has not committed to trialing it.
- There is currently no national register for home heating to identify eligible households.
- Co-ordination between numerous stakeholders would be required to enable implementation — likely requiring a significant awareness raising campaign.
- Does not reduce capital cost of heat pump installation, meaning proposition is primarily targeted at able to pay market.
- Further research is required to determine whether the scheme could be implemented without being considered as a subsidy/ loss of revenue.

*The assumed amount of electricity used by a heat pump to heat a medium-sized home to the same degree as a gas boiler[13].

Clean heat discount

Case study: E3G proposal[12-14]

Overview

E3G is proposing a targeted exemption of levies for electric heat users in the form of a 'Clean Heat Discount'. E3G has calculated that an annual 3.5MWh exemption of electricity for electrically heated homes could reduce running costs by around 15% for heat pump households and 5% for direct electric heating households.

Alongside sixteen other organisations, E3G have written to the UK Treasury calling on them to enact this proposal.

Financials

The levy exemptions could save consumers on average £130 a year (see table to right).

At maximum uptake, the scheme could amount to £390 million a year for all electric heating — £90 million a year for heat pumps and £300 million for direct electric.

Scale of deployment

Applicable to all electrically heated households in Great Britain subject to eligibility testing.

Heating Type	Before Levy Discount (£)	After Levy Discount (£)	After Smart Tariff (£)
Gas boiler	694	694	694
Heat pump (COP 2.8)	843	673	586
Heat pump (COP 2.94)	803	673	586
Direct electric	2,362	2,229	2,228

Average annual heating costs for a medium-sized household before and after levy discount and smart tariff[13].

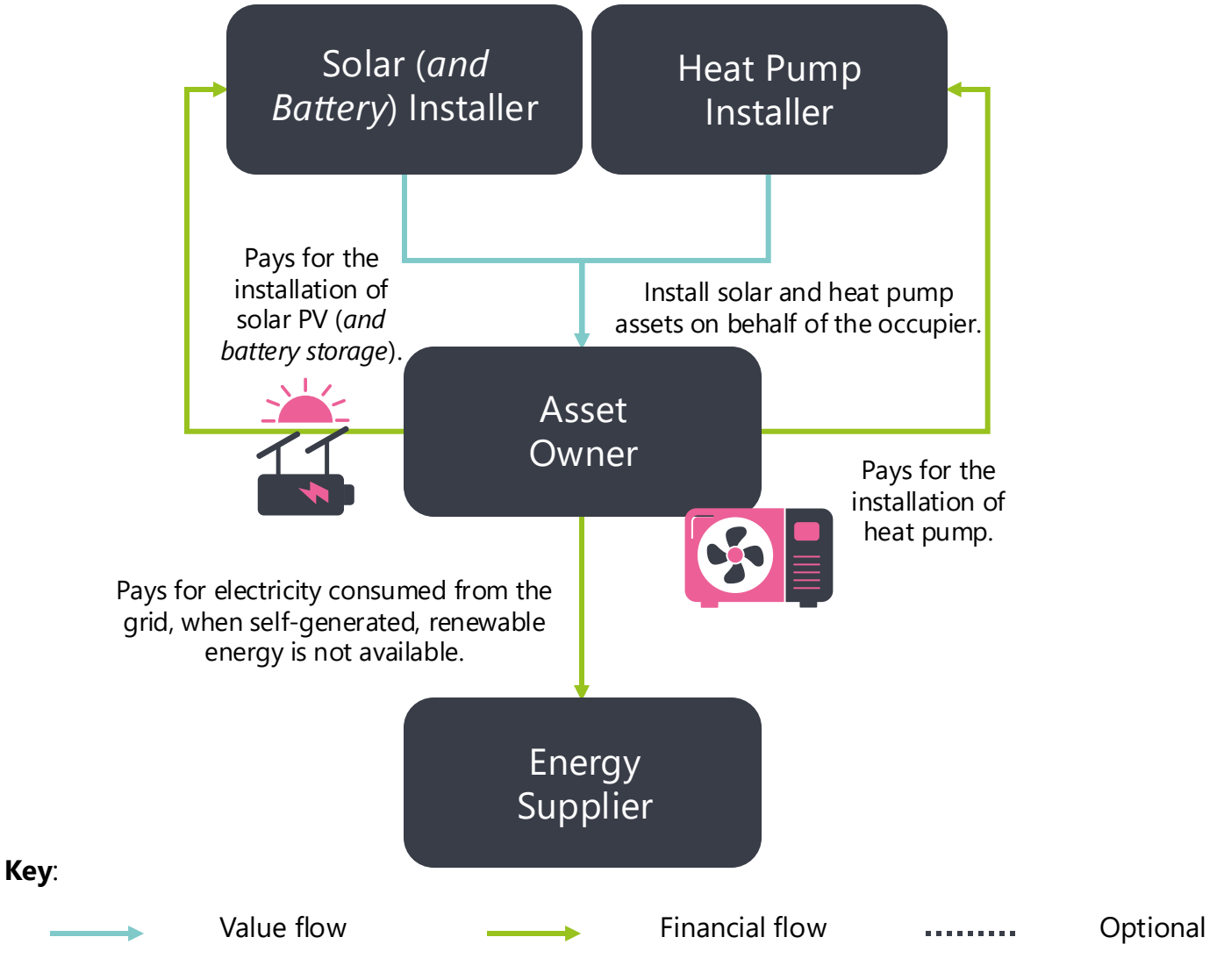
Maximising self consumption

In this model, households pay installers to install solar panels in combination with a heat pump to reduce reliance on grid imported electricity and the amount they spend on energy.

Annual energy savings may be as high as £1,030-£1,732[15]. These savings can be maximised by installing battery storage, which allows the home to use stored energy at night or on cloudy days.

Installation costs can be significant, depending on the size of the system and any necessary retrofit works. Some of these costs may be offset by the BUS.

Given the long payback period of this model, households should also consider whether they plan to stay in the property long enough to fully benefit from the savings.



Maximising self consumption

Primary benefits

- Significant annual energy bill savings*.
- Subject to eligibility, a portion of capital costs can be offset by the BUS grant (£7,500).
- Installers usually offer a free, no obligation quote, allowing customers to shop around to get the best deal.
- Revenue generation opportunity from exporting surplus renewable energy.
- Capital costs could be reduced by installing numerous low-carbon assets together rather than adopting a piecemeal approach.

Key risks and considerations

- Significant upfront capital cost for customers especially if fabric retrofit works are required prior to installation.
- Long pay back time, meaning customers should carefully consider whether they will remain at the property long enough to benefit from this proposition.
- Likely to be better suited to owner occupied properties due to length of payback.
- Unlikely to be many prospective customers due to significant upfront capital costs, meaning this proposition may need to be coupled with an attractive finance offering to increase market size.
- The scalability, equitability and affordability of this proposition could be questioned due to the avoidance of paying policy and network costs for renewable generated electricity (i.e., from solar PV).

*Compared to households that have installed heat pumps without solar and battery storage.

Community owned renewable heat

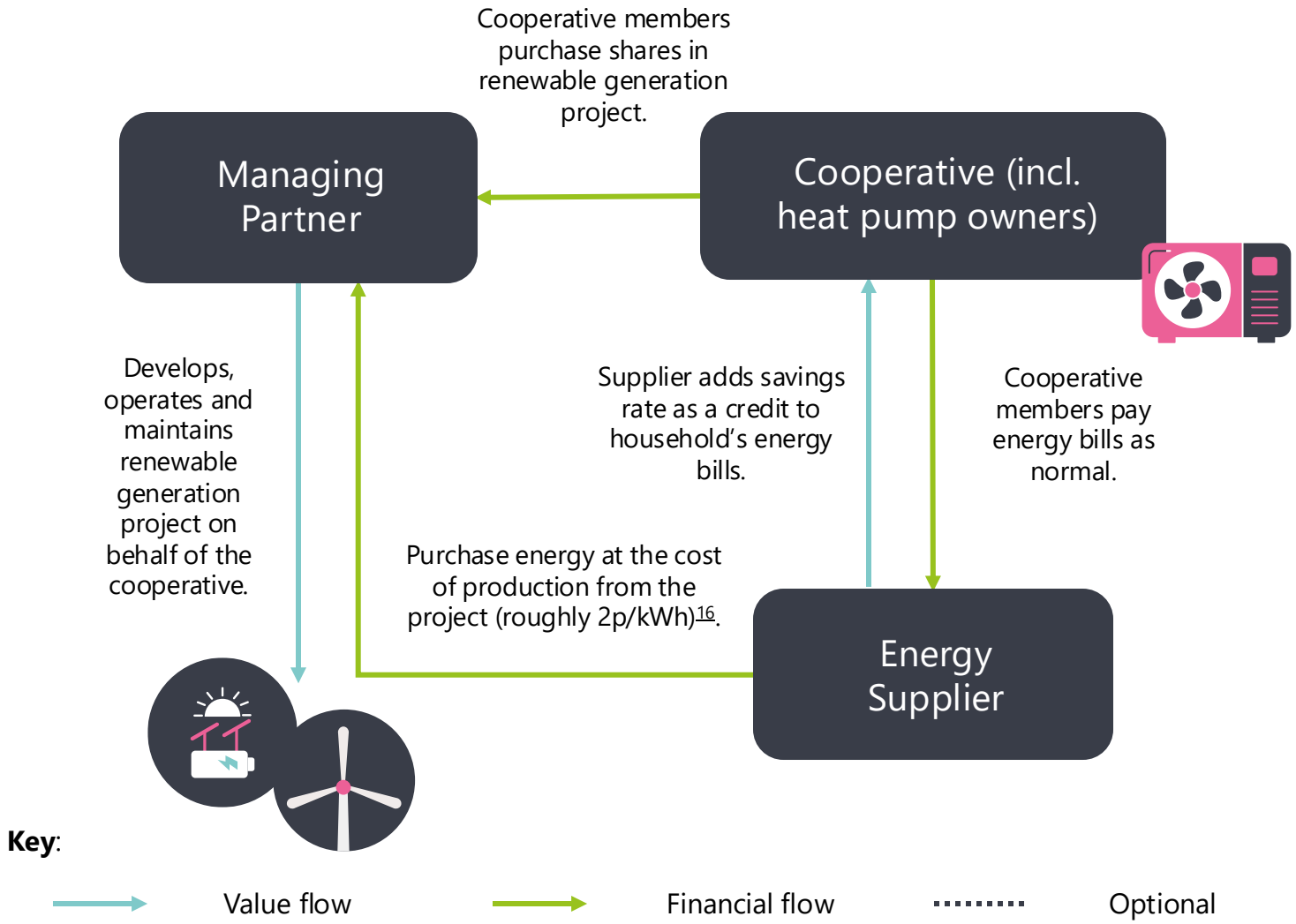
This model provides heat pump owners with discounts on their energy bills.

Households can invest in shares of a cooperative society that collectively owns a renewable generation project (e.g. wind or solar farm). The funds raised are used to develop the project, with development, operations and maintenance works undertaken by a managing partner.

Once the project is operational, an energy supply partner purchases renewable electricity generated by the project at its production cost.

The difference between the production cost and the wholesale market price represents the savings rate, which is passed on to cooperative members as a credit on their energy bills for the lifetime of the project or as a dividend payment.

The total savings for each member is calculated by multiplying the savings rate (p/kWh) by their share of energy generated by the renewable assets (kWh).



Community owned renewable heat

Primary benefits

- Coop members receive reduction in energy bills/ dividend payments in line with their share of asset ownership.
- Savings available for the operational lifetime of the renewable project.
- Provides opportunity for customers to own shares in a large-scale renewable generation project, which may otherwise have not been possible.
- Ability to 'port' agreement from one property to another if customer moves home.
- Wider decarbonisation benefits from increasing the deployment of renewable generation assets (additionality).

Key risks and considerations

- Fluctuations in wholesale electricity prices can impact the amount of energy savings that customers receive.
- Prior understanding of household energy consumption with a heat pump is preferred as can better inform investment decisions (e.g., how much to invest to maximise energy bill savings).
- Only available through partner energy suppliers, of which there are a limited number, meaning customers may need to switch from their current provider.
- Customers can switch suppliers if they are unsatisfied but only to those that are existing partners.
- Proposition only available on a project per project basis.
- Likely to be best suited to owner occupied households however further research could explore how the proposition can be modified to be more desirable to landlords.

Community owned renewable heat

Case study: Graig Fatha wind farm[17]

Overview

Graig Fatha, the UK's first consumer-owned wind farm, was delivered by Ripple, a renewable energy developer.

The farm has been operational since March 2022 and is owned by over 900 cooperative members.

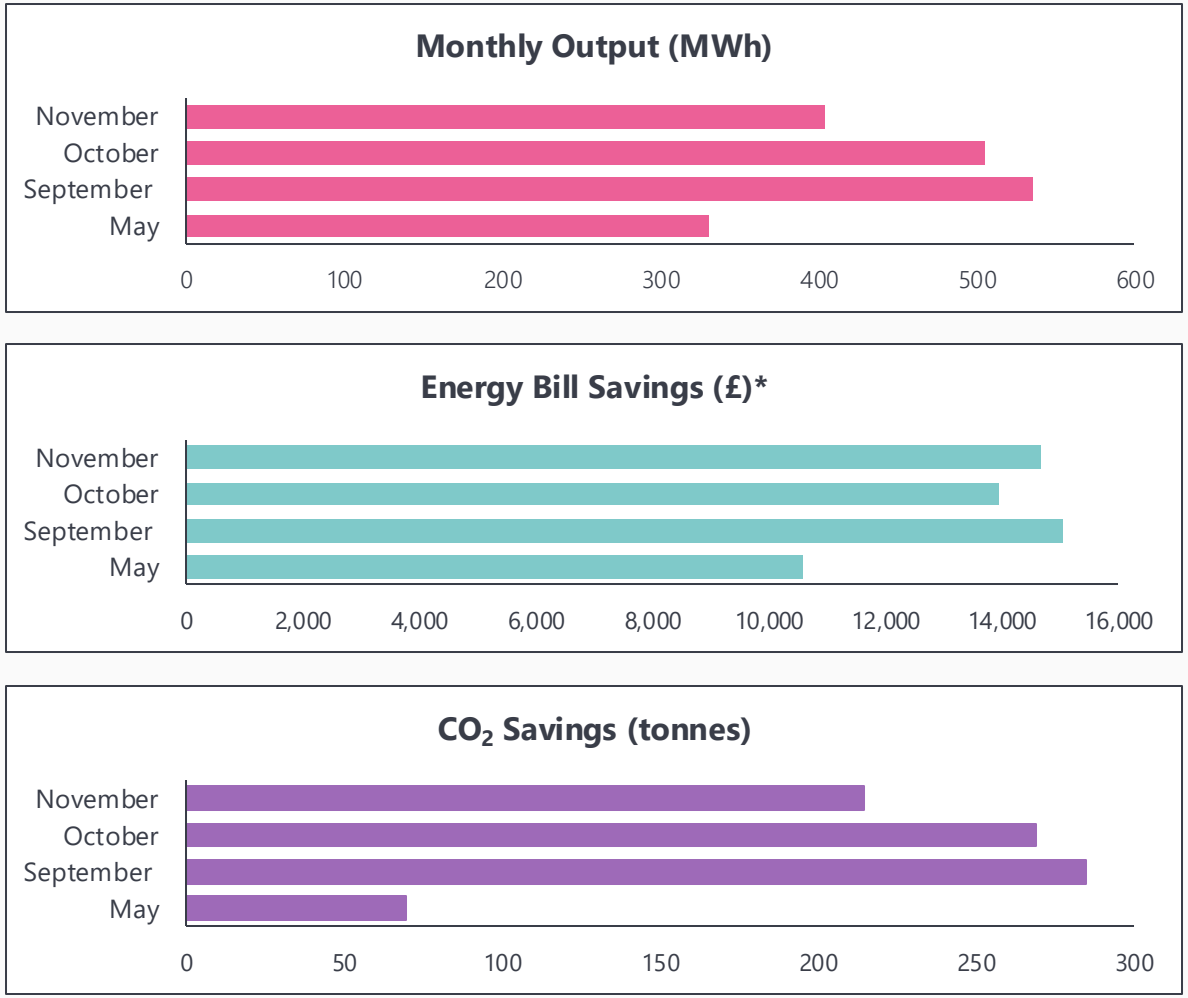
Ripple publishes monthly blog updates that provide key information about the farm's performance, including metrics such as output, energy bill savings and CO_2 emission reductions. The graphs to the right illustrate the farm's performance using data available for select months in 2024.

Financials

The project was supported by a £1.1m grant from the Welsh Government.

Income generated by the Welsh Government's portion of ownership is distributed to two charities: the Fuel Bank Foundation and the RCT Interlink. So far, more than £700k has been raised and distributed to these charities.

*Combined total value for all cooperative members.



Graig Fatha wind farm performance data available for select months in 2024[17].

Business model benefits summary

The table below provides a summary of the key benefits offered by each of the business models presented throughout this section, allowing readers to compare different options.

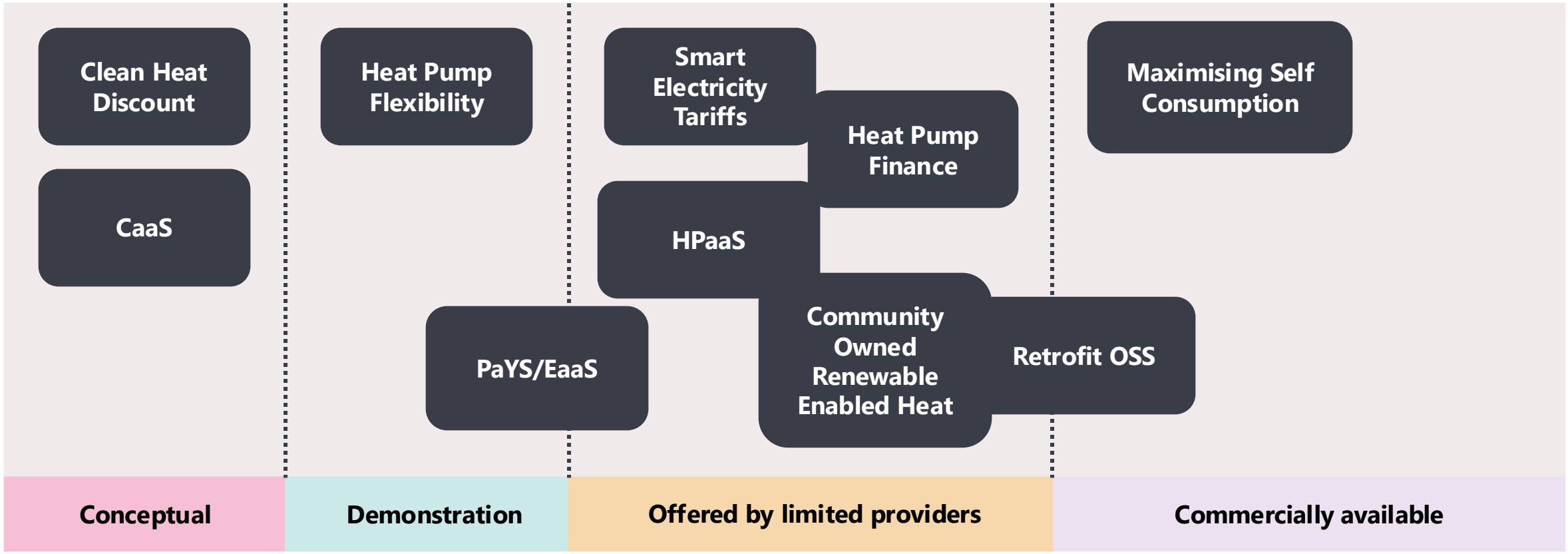
Business Model	Benefits				
	Eliminates upfront capital cost of heat pump installation for customer	Energy bill savings for customer*	Can be combined with other models to maximise value for customer	Provides a performance and/or comfort guarantee	Incorporates fabric retrofit to maximise heat pump performance/ efficiency
Heat Pump Finance	✓	x	✓	x	May be offered by providers at additional cost.
HPaaS	✓	Heating costs may be lower overall.	✓	✓	May be offered by providers at additional cost.
CaaS	✓	NA**	x	✓	✓
Retrofit OSS	x	Heating costs may be lower overall.	✓	x	✓
PaYS / EaaS	✓	Yes, but used to payback capital.	✓	✓	✓
Heat Pump Flexibility	x	✓	✓	x	x
Smart Electricity Tariffs	x	✓	✓	x	x
Clean Heat Discount	x	✓	✓	x	x
Maximising Self Consumption	x	✓	✓	x	May be offered by providers at additional cost.
Community Owned Renewable Enabled Heat	x	✓	✓	x	x

*Reductions observed compared to energy bills for heat pump households without access to the business model proposition.
** Difficult to score as customer pays for comfort and no longer pays for heat in the traditional way.

Business model maturity summary

The image below maps each of the business models considered throughout this section in terms of their commercial maturity, offering an alternative way to compare models.

Business model commercial maturity



Complementary funding mechanisms

Funding mechanism overview

The table below outlines funding mechanisms that complement the business model options discussed in Section 2, with the goal of further reducing financial barriers to heat pump adoption*. Each mechanism is discussed further throughout this section and, where available, real-world case studies are provided to demonstrate practical application. Although these mechanisms are designed to ultimately benefit consumers (heat pump users), the model descriptions also outline the roles local authorities can play in supporting or enabling their implementation.

Funding mechanism	Description
Group Purchasing	An approach where numerous customers (e.g., homeowners/landlords) buy heat pumps at scale to achieve cost reductions.
Concessional Finance	An approach were customers purchase heat pumps using loans with concessional terms offered by finance providers (e.g., lower interest rates or longer repayment schedules).
Property Linked Finance	A finance option where the repayment of a loan is tied to a property rather than an individual, so if the property is sold, the new owner takes on the obligation to continue repaying the loan.
Community Crowd Funding	A fundraising approach where individuals, businesses and organisations contribute money to support projects that benefit the community (e.g., decarbonisation projects).
Community Share Model	A fundraising approach where individuals can raise capital by purchasing shares via a community share offer, making them co-owners in community owned projects (e.g. renewable generation projects).
Carbon Credits	An approach which would unlock funding for heat pumps within the wider context of social housing retrofit, specifically by monetising carbon credits generated from emissions reductions.
Carbon Offset Fund	An approach which involves setting up a Local Carbon Offset Fund to collect carbon offset payments from developers, which would be repurposed to fund heat pump installation.

*Please note that this section reflects data and insights available at the time of writing (April 2025). No subsequent updates have been made.

Group purchasing

Group purchasing is an approach where numerous customers come together to buy products and/or services at scale to achieve cost reductions.

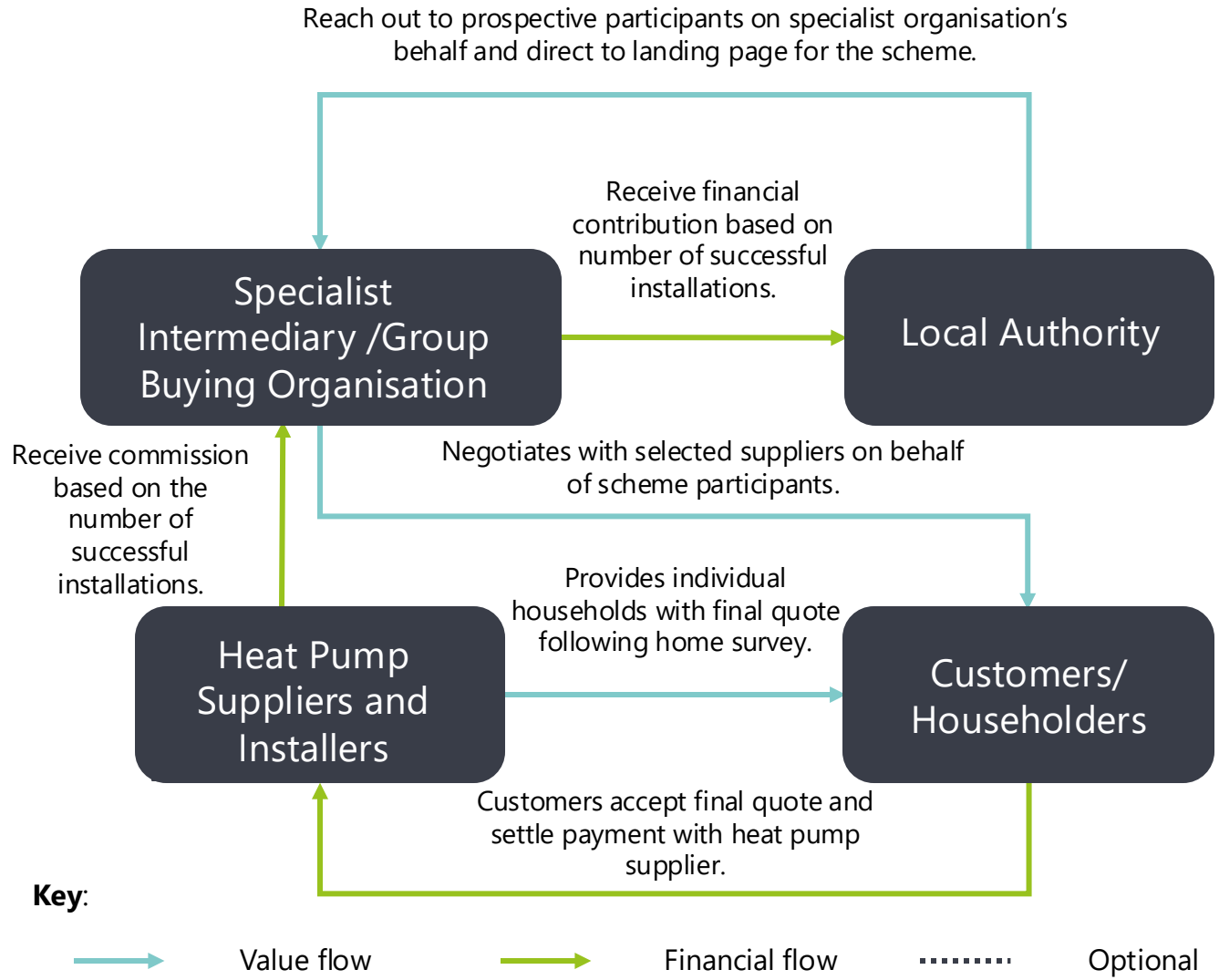
This approach has been particularly effective for solar PV technology, with average savings of 10-25% compared to typical market prices been observed in recent years.

A similar model could help partially address high upfront costs associated with heat pump technologies.

Local authorities could partner with a specialist group buying organisation to enact a group buying scheme for heat pumps in the area. They could promote the scheme through their website and social media platforms to encourage registration among households.

The specialist organisation would be responsible for negotiating the best price with heat pump suppliers and installers on behalf of participants.

Local authorities may receive some financial contributions from the specialist organisation depending on the number of successful installations, which could be used to fund other decarbonisation initiatives.



Group purchasing

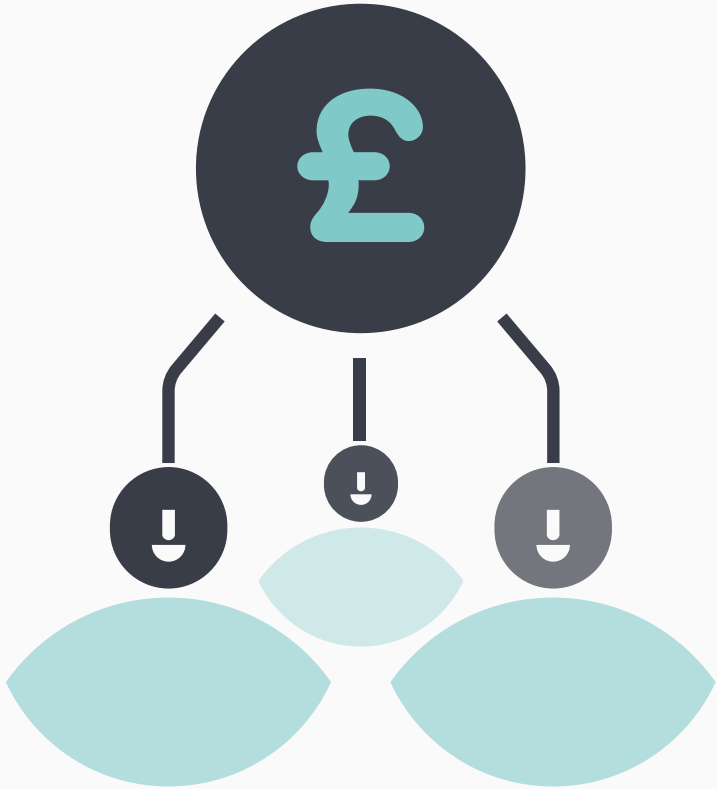
Case study: LIFE Street HP Reno[18-19]

Overview

The Energiesprong Global Alliance, in collaboration with European partners, has launched the Street HP Reno project, aiming to reduce the cost of heat pumps for private individuals through collective purchasing. Energiesprong will collaborate with municipalities to find homeowners who are interested in collectively switching to heat pumps.

As the facilitator of the scheme, Energiesprong will also work with heat pump suppliers to develop a product that is easer to purchase for customers. Training will also be provided to heat pump suppliers and installers.

The project runs from October 2023 until October 2026.



Financials

The total budget for the project is €2,250,734, with €2,138,198 of this amount awarded by the European Commission.

Scale of deployment

The first collective heat pump purchase is expected to take place in France. If successful, the approach will be rolled out to other participating European countries, including the Netherlands, Belgium, Germany and Italy.

Group purchasing

Case study: Nesta study[20]

Overview

Nesta aimed to explore whether group buying could be effective for heat pumps in the UK, following its success in solar PV deployment.

Method

The study executed the following method:

1. Identify key stakeholders and map out what the group purchasing process could look like.
2. Engage with key stakeholders (e.g., installers, wholesalers and group buying platform providers) to test the attractiveness of the proposition.
3. Undertake focus groups with potential customers to understand whether group buying would increase their motivation to purchase a heat pump.

Findings and conclusions

- Supply chain were confident that economies of scale could be achieved, suggesting possible discounts of around 5% for heat pumps and related kit, particularly when offered as a standardised package.
- Aggregating similar properties in a local area could provide greater certainty over labour costs, reducing the need for installers to over-quote.
- Consumers were positive about group buying but their expectations of savings were 'unrealistic', with suggested discounts ranging from 25% to 75%.
- Group purchasing is most likely to appeal to customers who are happy to accept an 'off-the-shelf' package.
- While group purchasing has the potential to drive the UK heat market, there needs to be a sufficiently large work force to accommodate increased demand.

Concessional finance

Concessional finance offers customers more favourable financing terms than those available in the open market, such as lower interest rates, extended repayment periods, grace periods, and/or percentage grants.

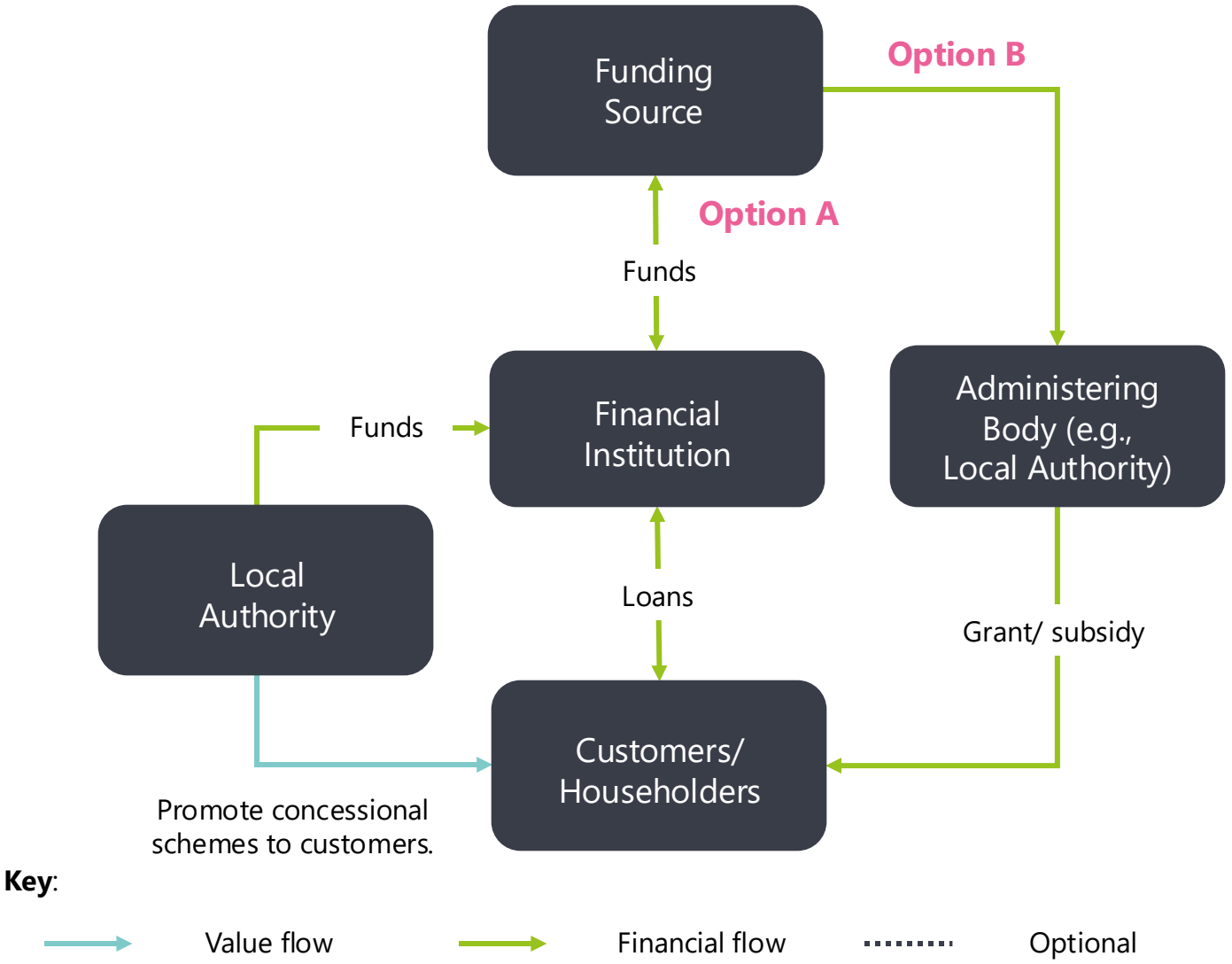
It is typically provided for projects/technologies that demonstrate positive environmental impacts.

Concessional finance can be offered to customers in various forms:

- **Option A**: A concessional loan provided by a financial institution.
- **Option B**: A grant awarded directly from a funding source (e.g., central government) and distributed by an administering body.

Local authorities could support or enable concessional finance in several ways:

- Partnering with a financial institution to promote concessional schemes through their existing channels.
- Providing capital to a financial institution, seeking only the return of the original funds rather than a profit, thereby ensuring an affordable interest rate for customers.
- Administering grants on behalf of central government to eligible consumers.



Concessional finance

Case study: Home Energy Scotland Loan[21-24]

Overview

The Home Energy Scotland Grant and Loan Scheme, funded by the Scottish Government, offers homeowners in Scotland financial support in the form of grants, interest free loans or a combination of both to install clean heating systems and energy efficiency measures.

For **clean heating systems** (e.g., heat pumps), homeowners can receive a grant of up to £7,500, with an additional optional interest-free loan of up to £7,500.

For **energy efficiency measures** (e.g., insulation), grant funding is available for up to 75% of the combined cost of measures. This is capped at a maximum amount of £7,500. The remainder of funding required can be taken up as an optional interest-free loan (up to the maximum funding limit per improvement*).

Rural and island homes are eligible for an additional £1,500 uplift applied to **both clean heating and energy efficiency grants**, bringing the maximum available grant funding to £18,000.

Home Energy Scotland provides advisory services for potential applicants, while the scheme is administered by the Energy Saving Trust, an organisation accredited by the Financial Conduct Authority.

Financials

Householders can choose how long to take to repay the loan, subject to maximum terms based on the borrowed amount:

- Up to £5,000 – repayable over 5 years
- £5,000 to £9,999 – repayable over 10 years
- £10,000 or more – repayable over 12 years.

Scale of deployment

In the financial year 2023-24, the scheme had a budget of £56 million, with £54,080,923 distributed by the end of Q3.

*Please see Reference 21 for further information on the maximum funding limit for each specific improvement/measure/technology.

Concessional finance

Case study: Warm Homes Suffolk[25-26]

Overview

Lendology provides loans funded by local partner councils to address specific community needs. Lendology recently partnered with Suffolk County Council to launch the £3m Warm Homes Suffolk loan.

The interest-free loan scheme helps homeowners invest in energy-efficient upgrades such as insulation, solar panels, battery storage, glazing, and heat pumps. The £3 million funding was secured as part of the council's "County Deal" negotiations and is targeted at residents who do not qualify for other grants.

The scheme is designed to be self-sustaining, with loan repayments reinvested to support future applicants.

Financials

Homeowners can borrow up to £15,000 at 0% interest (0.2% representative APR). Loan terms span up to seven years, with no early repayment charges.

A £20 fee is required to register a Title Restriction against the property, meaning the home cannot be sold without approval unless the loan is fully repaid.

Scale of deployment

Beyond the Warm Homes Suffolk loan, as of 2022, Lendology had issued 2,856 loans, totalling £16,876,523. Of this total, £9,851,326 had been recycled back into the fund.

Loan repayment rates remain strong, with less than 0.2% (£29,000) outstanding.

Property linked finance

Property linked finance (PLF) is a financial mechanism where loans are attached to a property rather than an individual or business.

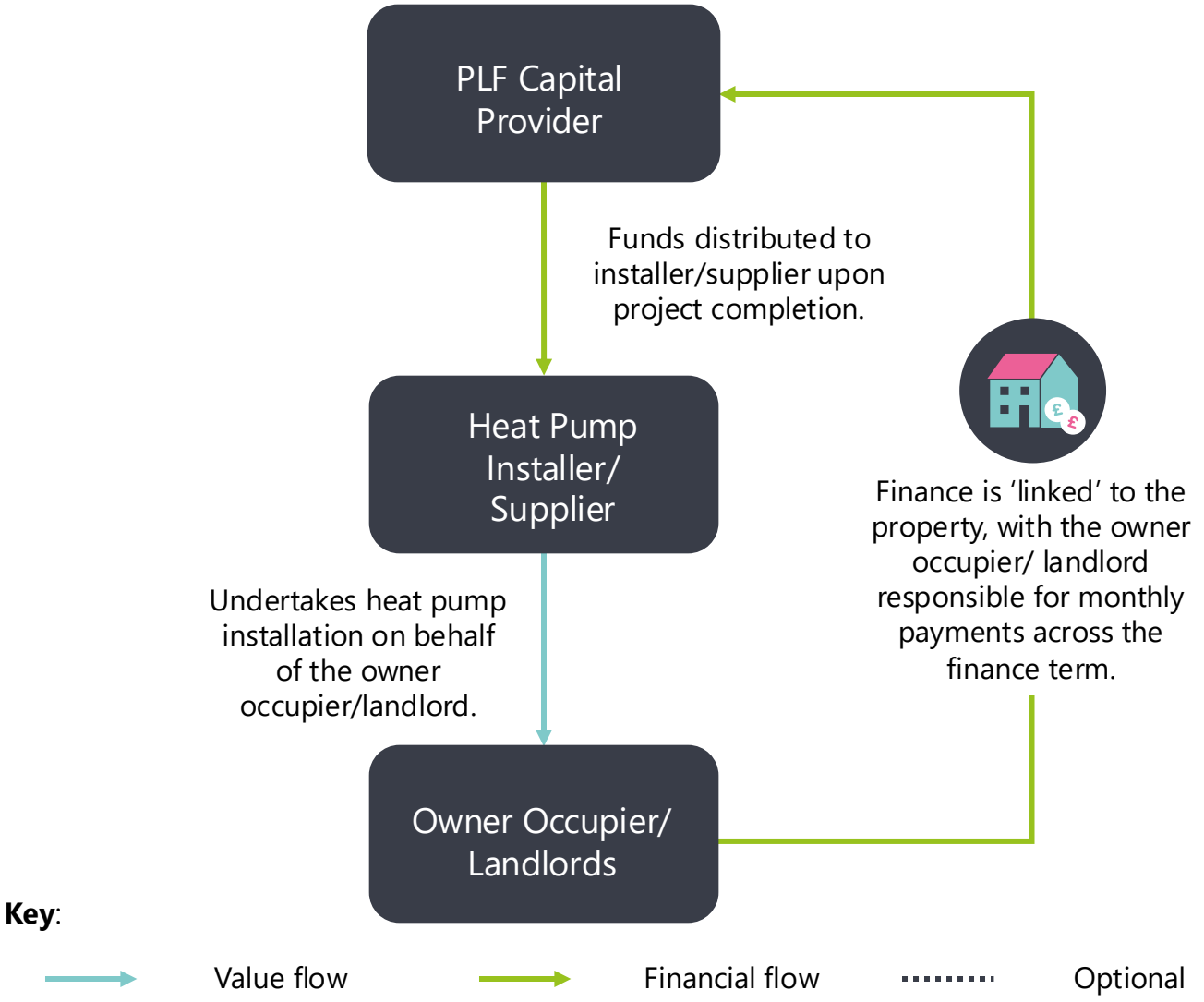
It can support the decarbonisation of properties by funding low-carbon technologies and/or interventions such as heat pumps, solar PV, energy storage, and energy efficiency improvements.

When the property is sold, the repayment obligation transfers to the new owner(s), ensuring the loan remains tied to the property.

There are several ways that PLF could be delivered:

- **Option A: Private Sector Financing** – Private sector capital providers fund building decarbonisation projects and establish a property-linked finance agreement, using a suitable linking mechanism.
- **Option B: Local Authority Financing** – Local authorities act as capital providers and recover payments through Council Tax.
- **Option C: Utility Financing** – A utility company provides financing and collects repayments via utility bills.

PLF is not currently available in the UK but has been demonstrated in other countries such as the United States and Australia[27]. The concept is also being explored by authorities in the UK, including the Greater Manchester Combined Authority and the West Midlands Combined Authority[28-29].



Property linked finance

Case study: A Greenprint for Property linked finance in the UK[27]

Overview

In collaboration with Lloyds Banking Group and Natwest Group, the Green Finance Institute has proposed a "Greenprint" for how PLF could be introduced, executed and scaled. The approach is based on five guiding principles:

1. **Runs with the land:** Payment obligations must remain with the land, regardless of property ownership.
2. **Customer ease:** The customer journey must be simple and allow property owners to make early repayments.
3. **Robust protections:** The capital provider should have legal recourse to recover missed payments, but this should not significantly impact the building owner.
4. **Impact**: PLF should not impact the availability of other financial products for the property (e.g., the mortgage).
5. **Flexibility**: PLF should be applicable to a range of tenures across the residential and non-domestic sectors.

The partnership also explored what 'mechanisms' could enable the linking of finance to properties so that the payment obligations run with the land. For residential PLF, "Local Land Charges" emerged as the most aligned linking mechanism. These are financial charges or restrictions on the use of land. Local authorities are responsible for maintaining the Local Land Charges register for their areas, though this responsibility may be transferred to the Land Registry.

The "Greenprint" also highlighted several key questions for future research:

- How can consumer concerns about selling and buying a property with PLF be addressed?
- What government infrastructure changes are needed to enable PLF to be listed in the Land Registry?
- Will new property owners have the option to refinance with a different PLF capital provider?
- How will mortgage lenders and PLF capital providers communicate with one another?

Community crowdfunding

Community crowdfunding is a fundraising method where individuals, businesses and organisations contribute financially to community projects. It includes debt-based, equity-based, and donation-based models. The example provided on this page represents a donation-based model.

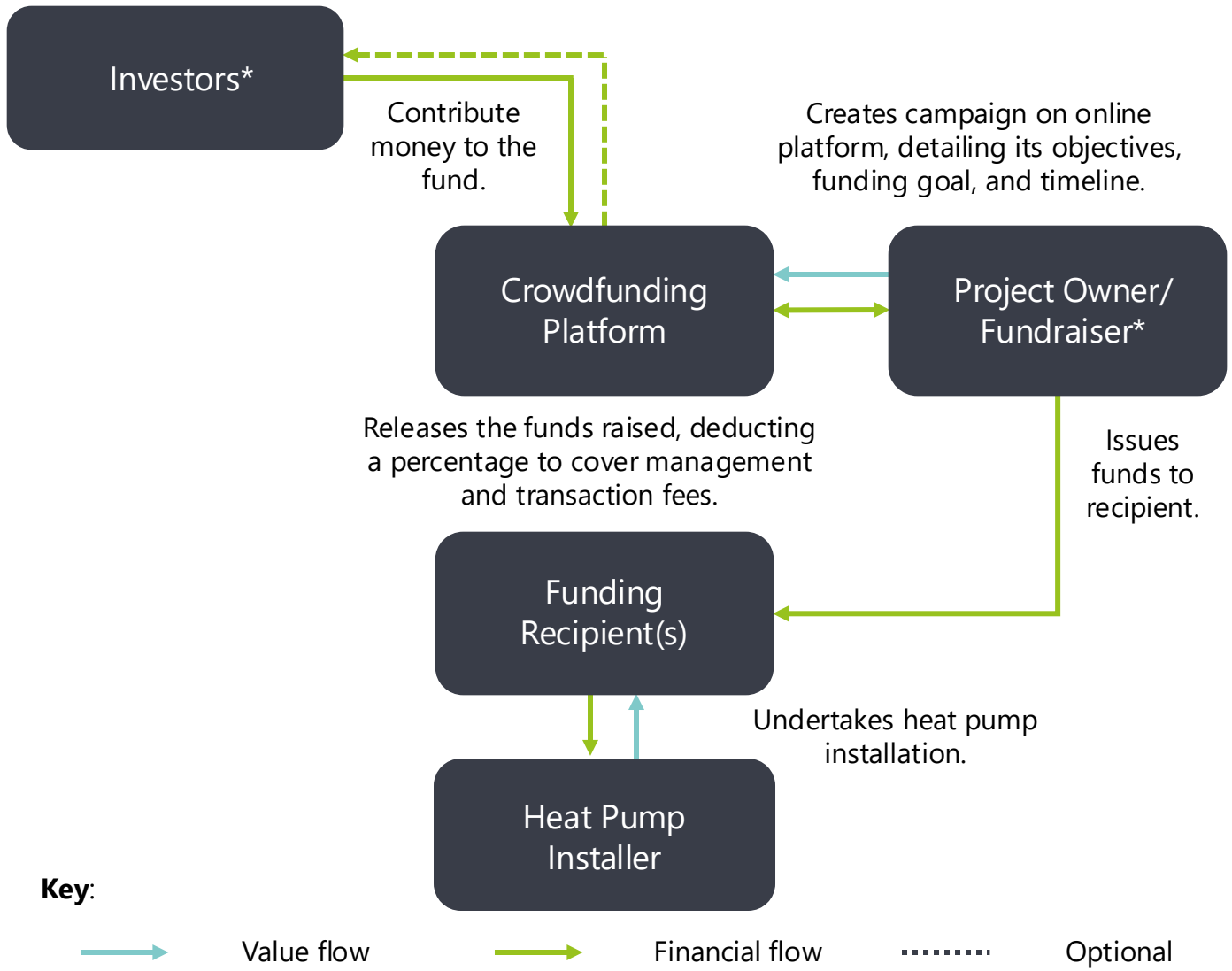
Fundraisers create project campaigns on crowdfunding platforms, which outline objectives, funding targets, and timelines. Once the campaign ends, funds are transferred to the project owner and distributed to recipients.

Community crowdfunding is typically employed to reduce the costs of heat pump installations in buildings that serve a community, rather than individual homes. However, this model could have the potential to work for domestic properties if funds are raised through donations for community-focused organisations that could, in turn, use the funds to support heat pump installations in individual homes.

Donations may come from businesses seeking to support local initiatives that align with their own decarbonisation and sustainability goals. They could also come from local individuals passionate about sustainability and looking for ways to support their community.

Local authorities could also provide match funding to supplement any donations received.

*Local authorities could assume both an investor and project owner/ fundraiser role (see Cheshire East Council case study).



Community crowdfunding

Case study: Cheshire East Crowd[30-31]

Overview

In 2023, Cheshire East Council launched the Cheshire East Warmer Greener Community Buildings Fund — a crowdfunding initiative supporting rural community projects focused on decarbonisation.

The initiative is being delivered in partnership with Spacehive, a community fundraising platform.

The fund offers grants to organisations across the borough for:

- The provision of Net Zero infrastructure for rural communities;
- Kitchen facilities in community hubs;
- Resilience infrastructure and nature-based solutions that protect from natural hazards, including flooding.

Once submitted by organisations, projects are reviewed and verified by Spacehive before going live on the platform to start receiving pledges from the community.

Financials

Once projects are live, Cheshire East Council's evaluation panel can choose to pledge up to 75% of total project costs, supported by the UK Rural and Shared England Prosperity Fund.

Scale of deployment

Although the fund is currently closed, Spacehive reports that 23 projects successfully met their funding goals, with £208,652 pledged by 1,405 projects.

Community shares[32-36]

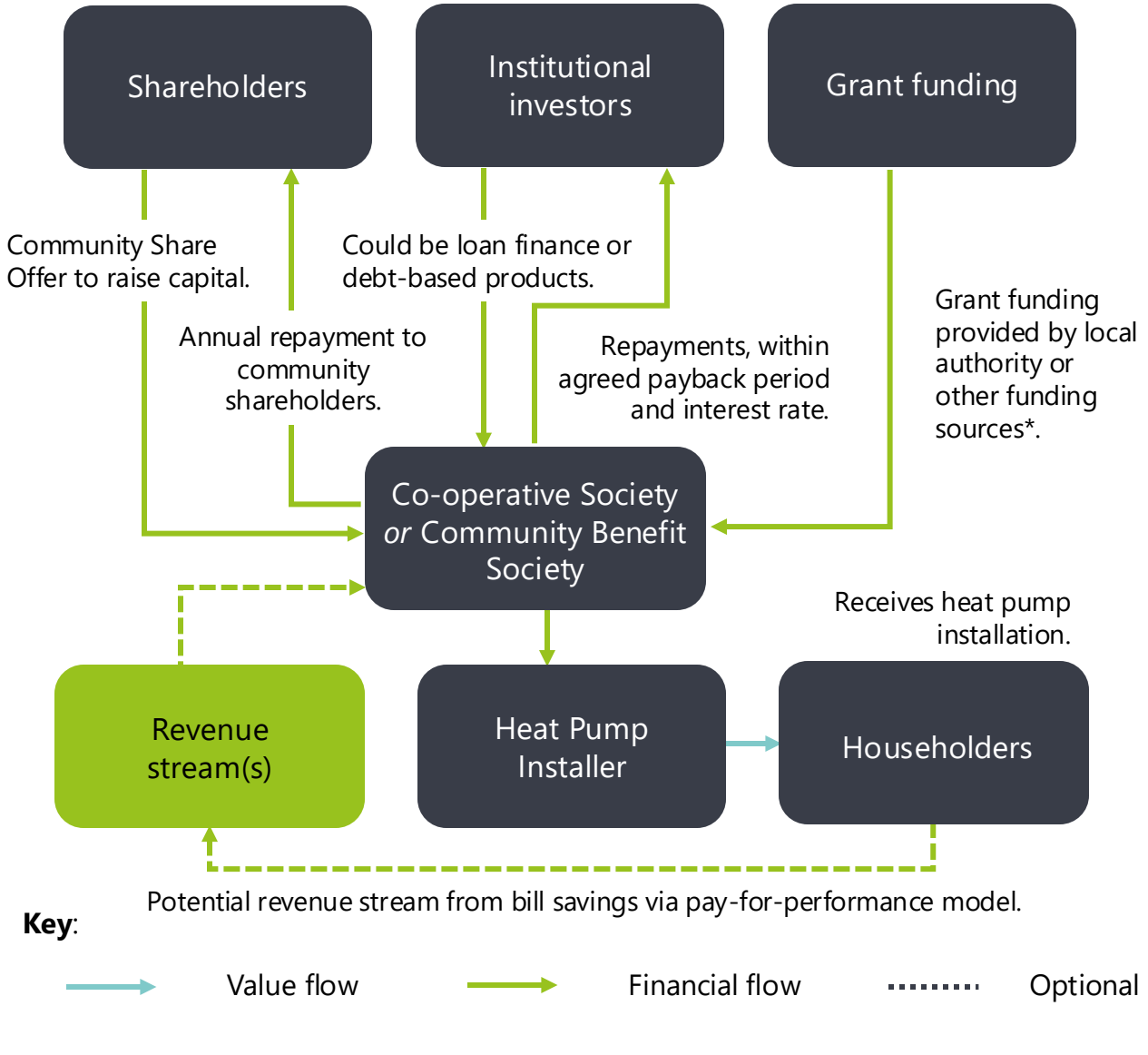
Community shares are a way for co-operative societies and community benefit societies to raise finance for local projects.

Residents buy shares in a society that owns a renewable energy (RE) asset, such as a wind or solar farm, becoming members and shareholders with a say in how it is run. In 2021, around 14% of community share offers financed renewable generation projects. Local authorities can actively help establish these societies, including through early-stage co-investment.

For this model to work, shareholders need a clear route to financial return. RE projects work well because subsequent Power Purchase Agreements (PPAs) guarantee investor payback and can service any loan finance. Applying this model to heat pump installations would require an equivalent revenue stream to cover repayable finance streams – for example, a successor to the domestic Renewable Heat Incentive (RHI) or a revenue-sharing model linked to household energy bill savings.

In practice, community shares usually form one part of a wider funding package. As shown in the diagram, a blended finance model could combine grant funding, a community share offer and repayable finance from institutional investors..

*A list of funding sources available for co-operatives and community benefit societies can be found here: https://www.uk.coop/support-your-co-op/funding-support-and-co-op-development/other.

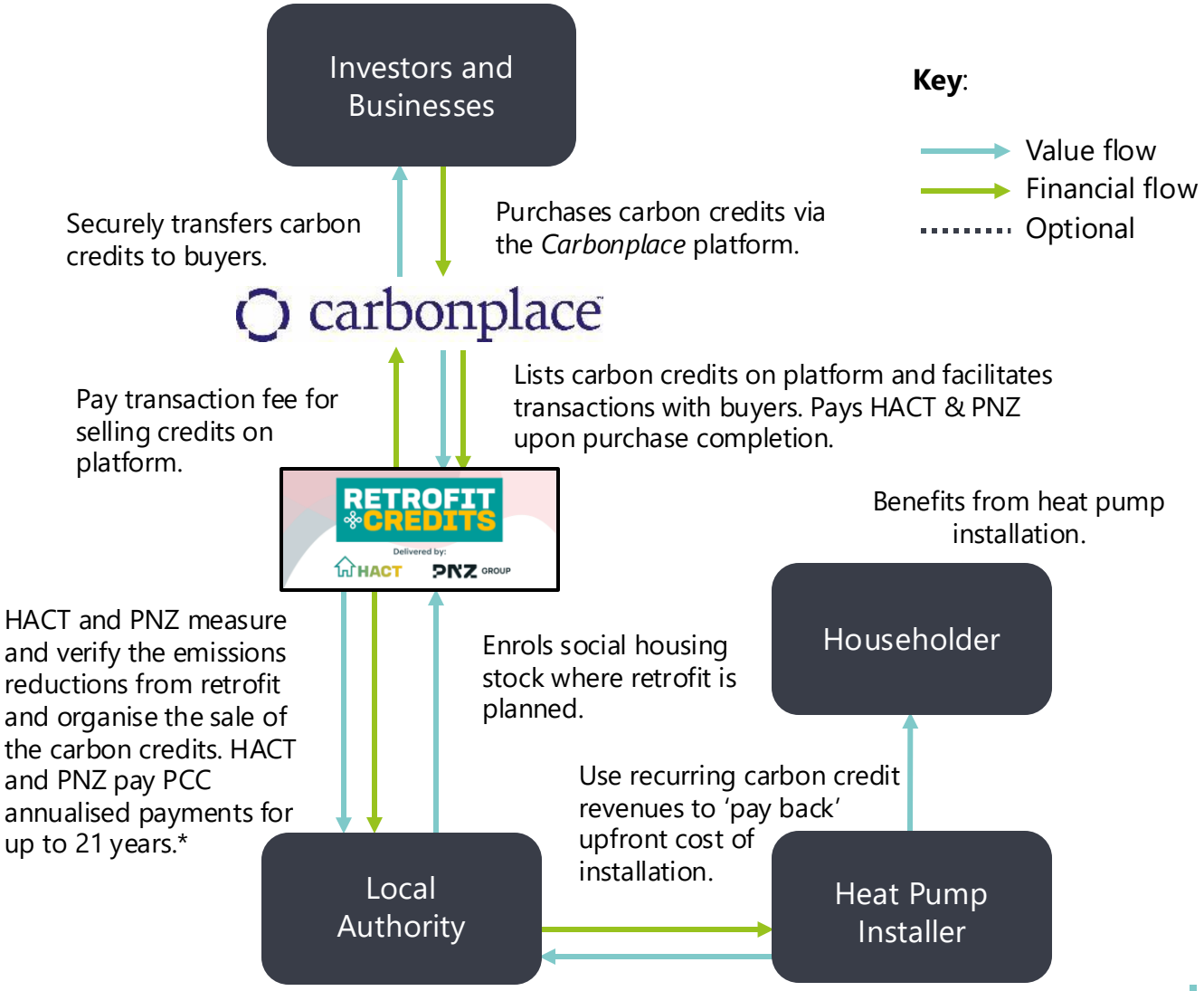


Carbon credit monetisation 37-42

Carbon credit monetisation provides an additional funding stream for social housing retrofit via the Retrofit Credits scheme, developed by HACT with PNZ Carbon. Emissions reductions from retrofit works are verified and converted into carbon credits, which are then sold to organisations seeking to offset their emissions, such as Berkeley Group, Unity Trust Bank and the Economist Group. The resulting revenue is paid back to the local authority or housing association and can be recycled into further retrofit projects.

Local authorities can enrol social housing stock for planned retrofit, with projected credits calculated in advance to support the investment case. HACT manages verification and credit sales, and payments reflect both carbon savings and wider social value. The model works best for whole house retrofit, rather than standalone heat pump installations, to maximise credit revenue and ensure the heat pump operates effectively alongside insulation upgrades. However, credits are issued and sold annually after works are complete, with revenues spread over roughly 21 years, so this does not provide substantial upfront capital for installation costs.

* Carbon credits are issued by Verra Registry annually for up to 21 years. Up to £7,000 worth of credits could be generated for a whole-house retrofit project across 21 years.



Carbon credit monetisation

Case study: Camden Borough Council[39-40]

Overview

Camden Council piloted HACT & PNZ Carbon's *Retrofit Credits* scheme with their completed social housing projects in 2023. Their involvement was supported by the Mayor of London's Future Neighbourhood programme. It was one of 22 social housing providers to have benefitted from the pilot.

Following the success of the pilot. Camden Council partnered with the initiative to launch the *Camden Retrofit Credits* scheme.

Financials

Camden initially secured £3m from the Greater London Authority (GLA) Future Neighbourhood programme to develop a local carbon offset fund to part-finance the retrofits.

Over a 19-year life span from 2024, the revenues from carbon credits could meet around 10% of the CAPEX costs for retrofit in Camden.

Camden Council are also discussing a separate pilot for 3000 homes, which could generate approximately £4.7m over 17 years.

Scale of deployment

The initial pilot involved 53 completed social housing retrofit projects in 2023. Data pertaining to subsequent retrofit projects that generated carbon credits was not publicly available.

Case study: Luton Council[43-47]

Overview

Luton Council have been engaged with the *Retrofit Credits* scheme since 2022, building on its existing efforts to improve the energy efficiency of its housing stock.

Rather than fully funding projects, the scheme provided supplementary funding for ongoing work. This is driven by the revenue model of the scheme, where credits are sold annually after project completion. Consequently, it does not provide a significant upfront capital contribution to the cost of installation.

Scale of deployment

Luton Council have onboarded nearly 997 homes as of the end of 2023. These 997 projects have achieved over 900 tCO_2e reduction and an estimated £600,000 worth of social value since 2022.

Social value refers to the positive social outcomes for residents, such as improved health, comfort, and reduced fuel poverty.

Local carbon offset funds[48-56]

Local carbon offset funds are set up by local authorities to collect and distribute carbon offset payments made by developers as part of their Section 106 agreements.* These funds are ring-fenced for carbon-reduction projects.

In 2016, the GLA introduced carbon offsetting for all major domestic developments through the London Plan, requiring local authorities to establish local carbon offset funds. Other councils followed suit.

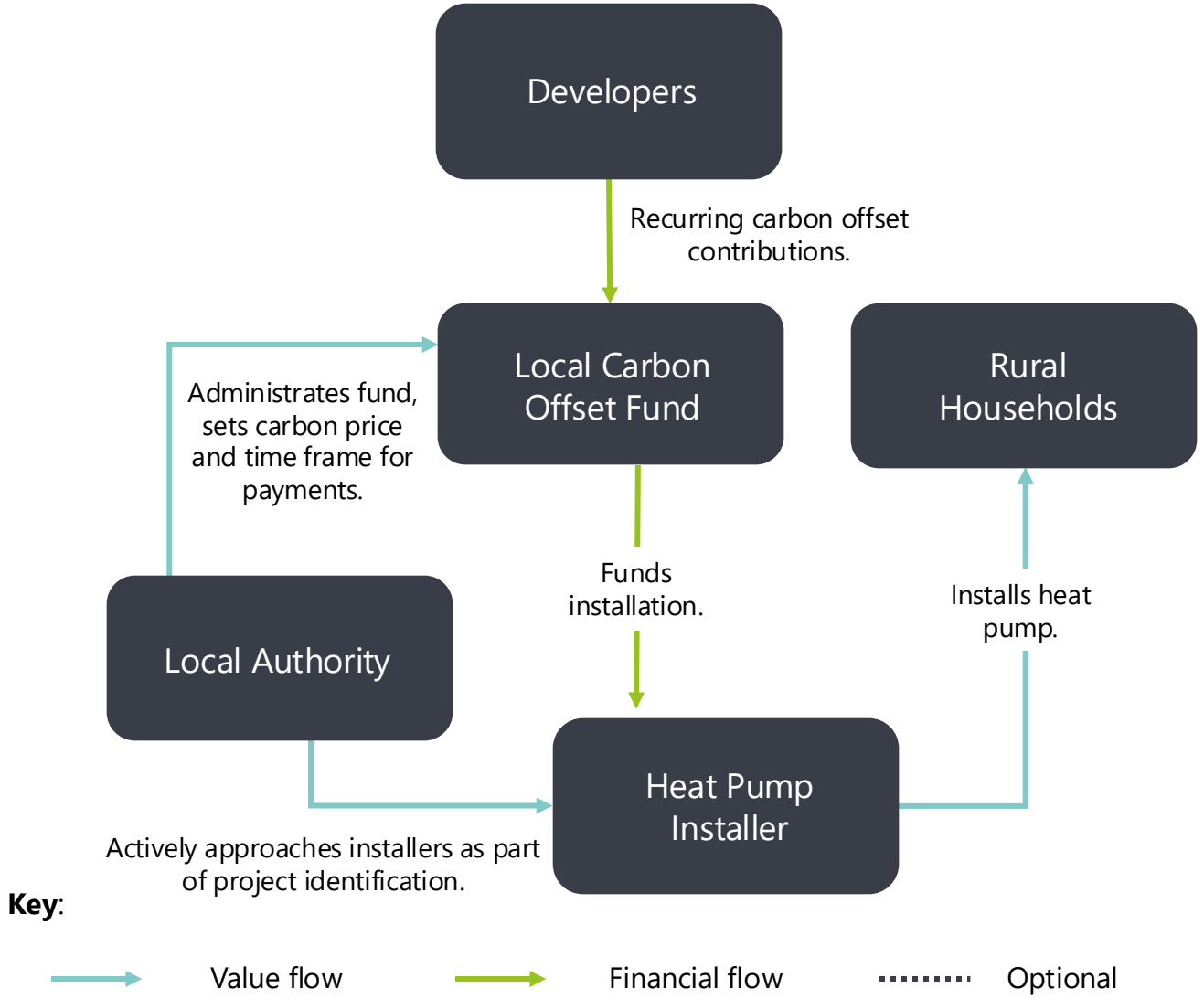
In this model, local authorities would set carbon emissions exceeding Part L of the Building Regulations (e.g., a 35% on-site reduction). Developers falling short of the target would contribute to the local authority's offset fund. Contributions are based on a set carbon price, with recurring payments made over a set period. In the case of smaller developments, the developer pays a flat fee per unit.

This would require the local authority to set a carbon price and a time frame for payments. An example contribution formula would be:

Carbon offset contribution = Carbon gap (residual tonnes) x Price of Carbon (£) x Numbers of years

Alongside administering the fund collection and allocation, the local authority would also need to identify a suitable range of projects to be funded through the carbon offset fund, which would feature heat pump installations.

*A section 106 agreement is a legally binding agreement or "planning obligation" between a local planning authority and a property owner. It mitigates the impact of a development on the local community, setting out terms binding the developers to provide, facilitate or fund measures needed for the development to be acceptable in planning terms.



Local carbon offset funds

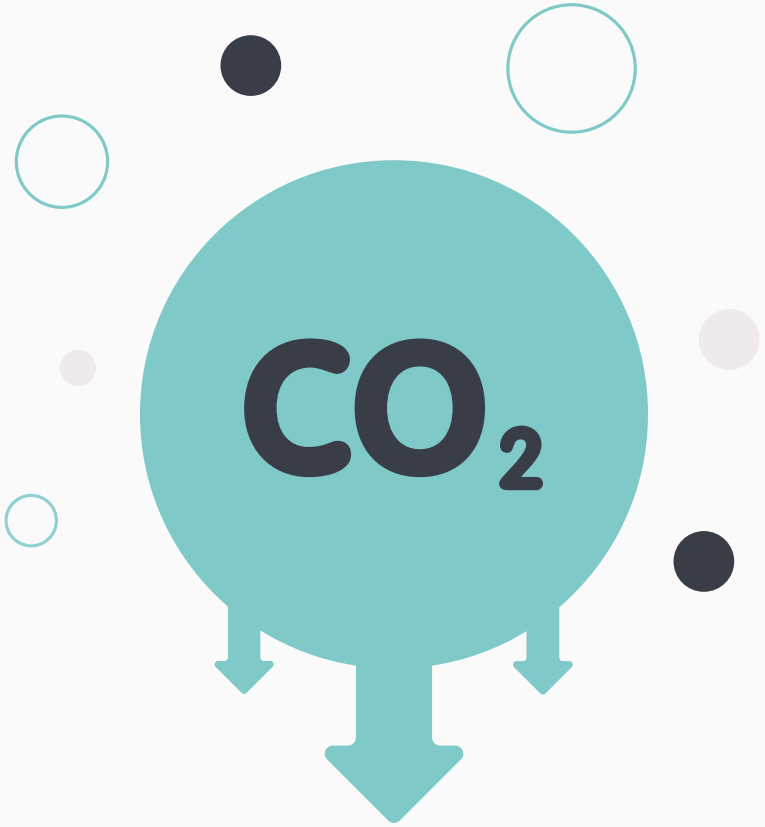
Case study: Milton Keynes City Council[57-59]

Overview

Milton Keynes City Council own and operate a Carbon Offset Fund to support carbon reduction projects.

Set up in 2005, it was the first city in the UK to set up a Carbon Offset Fund, setting an example for other local authorities to follow suit thereafter.

Eligible projects include heat pump installations, insulation upgrades and solar panel installations. The fund provides up to 50% match funding to support projects. It is aimed at community groups and public organisations, such as schools, not-for-profit groups and parish councils.



Financials

Developers are required to pay £200 per tonne of annual CO_2 emissions into the fund.

The fund has collected £6.3m since its inception. It has also received 55 enquires since 2022 until 2024, seeking £2.9m in contributions.

The fund has awarded £470,000, resulting in 12 completed projects (as of August 2024).

Funding mechanism suitability summary

The table below summarises the suitability of each funding mechanism discussed in this section for supporting heat pump deployment in rural areas, helping readers compare different options. The suitability rating considers both the alignment of these mechanisms to heat pump assets and their availability in the UK market.

Funding mechanism	Rating	Rationale
Group Purchasing	Could be suitable	Group purchasing has been demonstrated in the UK for other low-carbon technologies, such as solar PV. A study undertaken by Nesta concluded that although group purchasing has the potential to drive the UK heat market, there needs to be a sufficiently large work force to accommodate increased demand.
Concessional Finance	Suitable	There are numerous examples of concessional finance schemes being provided to support heat pump deployment in the UK.
Property Linked Finance	Not currently suitable	While PLF could be used to fund the installation of heat pumps in properties, it is not currently available in the UK.
Crowdfunding	Could be suitable	While many platforms support crowdfunding for heat pumps, they are typically used to raise funds for projects in community buildings rather than individual households.
Community Shares	Could be suitable	While some community share offers have raised capital for isolated projects funding heat pump installations, this has relied on the RHI incentive and adjacent revenue streams from renewable generation assets to pay back investors.
Carbon Credit Monetisation	Could be suitable	Although there are various instances of the *Retrofit Credits* scheme supporting heat pump uptake, deployment is constrained to social housing properties as opposed to all tenure types.
Local Carbon Offset Fund	Suitable	There are several examples of carbon offset funds being used to finance domestic heat pump deployment across the UK.

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